

# Promoting Use and Contribution of Open Educational Resources

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# Foreword

Research on open educational resources (OER) is scanty and relatively new phenomenon. A quick look at the OER knowledge Cloud shows 1298 documents, and a search of EBSCO database reveals 1870 peer reviewed full-text papers, of which only 699 are in English. In contrast, the same Database showed 2269 peer reviewed full-text papers for massive open online courses (MOOC) with 995 in English. Therefore, this monograph is of significant importance and adds to the growing research literature on OER. The research conducted at COL's regional office in New Delhi – Commonwealth Educational Media Centre for Asia (CEMCA) was possible thanks to a generous grant from the International Development Research Centre (IDRC), Canada through the University of Cape Town. IDRC's support for OER research in the global south has created a network of researchers, who have focused on OER from a range of perspectives covering, policy, pedagogy and practice.

The research conducted at CEMCA involved teachers of four Indian Universities and indicates some interesting results. The report highlights the need for a systematic approach to mainstreaming OER in Indian higher education. While teachers generally have a positive attitude toward OER, and altruistic motives, they also need additional support and external motivation such as recognition, credit for promotion, and release time to develop OER. Advocacy and policy for OER work would certainly strengthen greater adoption of OER in educational institutions. In order to use OER, teachers are looking for 'fitness of purpose' and the reputation and credibility of the source. The development of a robust quality assurance mechanism for OER in institutions, integration of OER in teaching and learning, and capacity building for OER skills, would lead to improved adoption. In the process of the research, CEMCA has developed a tool to measure attitudes towards OER, and this could be used to measure faculty perceptions so that appropriate strategies for capacity building could be developed.

The present volume is just a tip of the iceberg of the research output that the ROER4D network is expected to produce. However, there is need for more research in the field of OER, and there is a need for research agenda to help young researchers to undertake research at the doctoral level. Some topics that need more research include cost-effectiveness of OER, financing models, sustainability, and the pedagogical interventions that lead to improved learning outcomes.

I congratulate the principal investigator of this research, Dr. Sanjaya Mishra, and all those engaged in supporting this work, with the hope that this publication will trigger further research on OER in the global south.



**Asha S. Kanwar**

President & Chief Executive Officer  
Commonwealth of Learning, Canada



# Preface

Let me start with a personal story. When I was a child, I often came across the riddle, “Name something that never gets reduced by sharing,” and the answer was obviously “knowledge.” When you share knowledge, you do not lose anything, unlike sharing money or anything physical, such as food, property, etc. In fact, the person receiving knowledge gains, and the person who shares also gains in the process. So, it is a win-win situation. As I grew up, I never imagined that one day, I would be talking, promoting and making a living around this riddle. When I started my career at the National Open University in India, I recognised the potentials of open and flexible learning, and I realised that learning is always personal; it happens somewhere inside our brain through a change in biochemical status that records new knowledge for future retrieval, comparison and use. Through exploration in this world, I came across open educational resources (OER), which had significant implications for expanding the answer to that childhood riddle. I could see that with OER, it would now be possible to make education and learning more efficient and effective.

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As an undergraduate student in a reasonably good college, and then in university, I had the opportunity to learn from some of the finest teachers. My college had a good library that provided weekly access to the textbooks recommended by teachers in the class. However, with about 16 of us demanding the same title, it was always first come, first serve, as not enough copies were available to satisfy all of us. Hence, although the costs were high, we had to buy at least some of the textbooks in order to manage the whole curriculum; we would also share them with friends. Sometimes, the recommended books would not be available in the local book shops, and we would have to order the book, check with the shop several times, and wait as long as two or three months to buy it. That was the pre-Internet era. While today, access to information has become easier, I am not sure that access to textbooks has improved. Libraries are facing more financial challenges than ever before, and there are more demands from students than in my college days.

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With OER, it is possible to provide every student in India with a personal, free copy of a digital textbook for each of the subjects they study in college. Offering free textbooks to over 33 million students may sound utopian. However, with the current level of spending to improve the quality of higher education in India, and with over 1.4 million teachers, it is possible to achieve this dream. The cost of a digital copy of a textbook is near zero, and economies of scale will apply very well with the number of learners available to take advantage of these opportunities. What is essential is to

increase teachers' awareness and understanding of how to use and adapt OER for the benefit of their students. This monograph is an exploration to understand higher education teachers' perceptions about the use and contribution of OER. It stems from a personal belief that teachers can make a difference by sharing and adapting already available educational materials via open licences. As a result of this research, we have a better understanding of how to mainstream OER in Indian higher education. Teachers with awareness and understanding of OER can identify and adapt existing resources to help learners avoid buying expensive textbooks. Government support for mandating that publicly funded teaching and learning materials be released as OER can create an educational ecosystem of sharing quality learning resources all over the country.

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This research became possible due to a generous grant from the International Development Research Centre, Canada, through the University of Cape Town. We greatly appreciate IDRC's commitment to promoting research on OER.

I am grateful to Professor Asha Kanwar, President and CEO of COL, for permitting me to undertake this research and for writing the foreword. Mr R. Thyagarajan and the staff at CEMCA provided timely and necessary support in carrying out the research. I thank Dr Ramesh Sharma, Ms Alka Singh, Dr Meenu Sharma and Dr Atul Thakur, who assisted with the research at various points in different ways. I am also thankful to Dr Cheryl Hodgkinson-Williams, Ms Tess Carmill and the University of Cape Town team for providing periodic assistance. Dr Glenda Cox and Henry Totter played a very significant role in finalising the interview schedule, and my sincere thanks are due to them. I am also thankful to all the workshop participants, survey respondents and institutional leaders for facilitating this research at their university. Last but not least, thanks are also due to Dr Shahid Rasool, Director of CEMCA, for the co-operation he extended to bring out this publication.

I hope this research work will encourage others to take up research in the area of OER, leading to an enabling environment for mainstreaming OER in Indian higher education.

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# List of Abbreviations

ACT	Access, Costs and Time
ATOER	Attitude Towards OER
CC	Creative Commons
CUTM	Centurion University of Technology and Management
ICT	Information and Communication Technology
IGNOU	Indira Gandhi National Open University
JAM	Just-a-Minute
KKHSOU	Krishna Kanta Handiqui State Open University
M	Statistical mean
MANUU	Maulana Azad National Urdu University
NCERT	National Council of Educational Research and Training
NKC	National Knowledge Commission
NROER	National Repository of Open Educational Resources
NUEPA	National University of Educational Planning and Administration
OCW	Open Courseware
OER	Open Educational Resources
PBC	Perceived Behaviour Control
QA	Quality Assurance
RLO	Reusable Learning Object
RLO	Reusable Learning Object
ROER4D	Research on Open Educational Resources for Development
SDL	Self-Directed Learning
SET	Social Exchange Theory
SLT	Social Learning Theory
SP3	Sub-Project 3 (of ROER4D)
SP4	Sub-Project 4 (of ROER4D)
STRIDE	Staff Training and Research Institute of Distance Education
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UCT	University of Cape Town

# Introduction

## 1.1 Background

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Open educational resources (OER) have emerged as one of the most innovative teaching and learning practices as well as cost-effective mechanisms to improve the quality of educational offerings by optimising the use of available resources. While OER can be used by any institution, universities depending upon packaged learning materials can use OER to improve their cost-efficiency. OER have the potential to transform teaching and learning practices in all educational settings. They can be used to reduce the time to develop courses and programmes, facilitate knowledge sharing, preserve and disseminate indigenous knowledge, and improve educational quality at all levels (Kanwar, Kodhandaraman, & Umar, 2010). For teachers and students, OER (i) provide access to global content that can be localised without restrictions, (ii) give them more choices about learning resources and (iii) create inclusive learning communities (Butcher, 2011).

While India has over 700 universities, including 17 open universities, the use of OER in tertiary education is not common. However, the potential for OER both to improve the quality of teaching and learning and to achieve cost-efficiency is enormous. India as a developing country seems to have a growing appetite for openness in education, including the creation and dissemination of OER. The country has a National Repository of Open Educational Resources<sup>1</sup> (NROER) for K-12 educational materials. In 2008, the Indian government's National Knowledge Commission (NKC) called for a "national e-content and curriculum initiative" to stimulate the creation, adaptation and utilisation of OER by Indian institutions and the leveraging of OER produced outside India (Perryman & Seal, 2015). The Indira Gandhi National Open University (IGNOU) in 2010 started a Post Graduate Diploma in E-learning (PGDEL) using OER, and several Indian teachers have participated in Learning4Content workshops on the WikiEducator<sup>2</sup> platform. The Commonwealth Educational Media Centre for Asia (CEMCA) has assisted several organisations to develop content using WikiEducator, while IGNOU's Staff Training

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<sup>1</sup> <http://nroer.gov.in/welcome>

<sup>2</sup> [http://wikieducator.org/Main\\_Page](http://wikieducator.org/Main_Page)

and Research Institute of Distance Education (STRIDE) in 2008 used online wiki training skills to develop self-learning materials for distance education.

To promote the use of OER and contribute to their production, more efforts are needed to build capacity, develop OER and use them in appropriate instructional design models for teaching and learning.

## 1.2 Research Problem and Justification

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Typically, OER are prepared by teachers in specific contexts, to help students learn certain subjects. Thus, teachers are central to the production and use of OER. However, Petrides, Jimes, Middleton-Dezner, Walling and Weiss (2011) reported research by Livingston and Condie (2006) that student learning was hampered by “teachers’ lack of expertise in fully leveraging the open resources to assist students to become more independent learners,” and that “teachers lacked the technical skills to effectively integrate” new OER into their courses. Petrides et al (2011) also expressed concerns in the open textbook project and reported that:

[F]aculty with lower comfort levels with using online technology made use of open textbooks in ways that exemplified more traditional ways of working with materials. There exists a need to build on the technology, practices and tools made possible by open textbooks to enhance teaching and learning practices. Furthermore, the research illuminates the potential importance of leveraging teachers’ existing curriculum needs, teaching practices, and technological efficacy and expanding professional development to facilitate future open textbook use. More specifically, this development should allow teachers to draw on their existing ways of working as they engage with open textbooks and associated social networking tools, and encourage them to further develop, practice and model new behaviours and tools with their students. (p. 46)

Hence, it is necessary to understand the psychological and behavioural determinants that may influence better use of OER by teachers. Olcott (2012) suggested that future research ought to examine the concept of open educational practices and OER issues relevant to faculty incentives and career advancement in the university. There is a need to understand why some teachers share their work while others do not. Researchers in this field therefore should examine how teachers’ predispositions and espoused views about pedagogical practices and innovations determine their OER practices.

There have been several sporadic attempts to promote the use of OER in India, but a culture of contributing to OER and integrating the use of OER in educational transactions in both face-to-face instruction and distance education remains underdeveloped. Considering the number of institutions and the total enrolment they serve, wider availability of digital content as OER and their appropriate use by teachers would create a new learning environment.

The present research was conducted in different scenarios, covering where teachers were aware of OER as well as where they were not. The research investigated the psychological as well as practical aspects of teachers’ engagement with the concepts

and practices of OER at individual and institutional levels. The results of the study will be of interest to policy makers and institutional leaders for designing effective strategies to integrate OER into teaching and learning practices by considering teachers' conceptions about the quality of and barriers to OER. These results can also guide capacity development activities by identifying motivators and positive predispositions needed to promote the effective use of OER.

The significance of the research stems from there being relatively little research literature on the psychological aspects of one of the main stakeholders in OER: teachers. If OER are to be mainstreamed into teaching and learning in higher education, it is necessary to understand why some teachers use OER and some do not, including what motivates them to share their work with others. We know that teachers' conceptions of teaching and learning influence on how they teach and engage their students. The premise of the present study is that teachers' conceptions of OER and their quality will influence how they will use OER or, even more fundamentally, whether they will use and adapt OER at all.

### 1.3 Research Questions

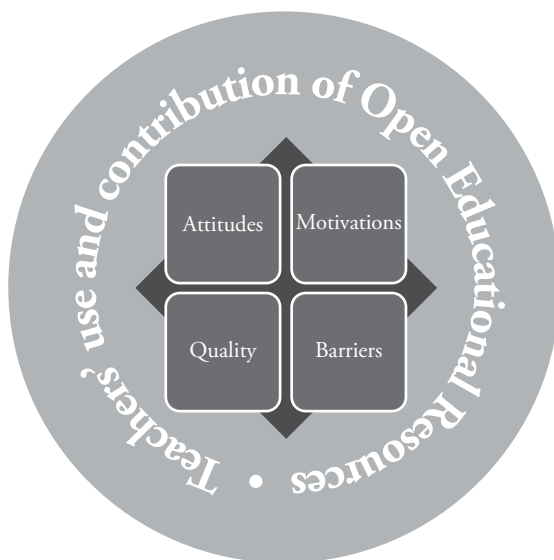
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While it is necessary to understand teachers' psychological and behavioural determinants that may influence their better use and adaptation of OER, it is also important to understand the ecosystem in which they might create–evaluate–use OER. We need to ascertain why some teachers share their works and others do not. Teachers' predispositions and espoused views about pedagogical practices and innovations determine their OER practices (both use and contribution). The present research was conducted in different settings (open universities, traditional face-to-face universities, universities in cities and universities in remote areas), covering where teachers were aware of OER as well as where teachers were not. It focused on investigating the psychological as well as practical aspects of teachers' engagement with the concepts and practices of OER at individual and institutional levels. In general, the research attempted to answer the following questions:

1. How are teachers' attitudes towards OER situated in the context of teaching and learning?
2. Is there any difference in attitude towards OER between teachers according to different demographic variables?
3. What are teachers' motivations for using OER and sharing their work as OER?
4. Is there any difference in motivations between groups of teachers (based on the measured demographic variables)?
5. What barriers to using OER do teachers perceive?
6. How do teachers perceive the quality of OER?
7. Are there relationships between teachers' attitudes, motivations and perceptions of quality when it comes to them using and adapting OER?

## 1.4 Conceptual Framework

Some recent studies have applied different lenses to examine the use of OER. Hodgkinson-Williams and Paskevicius (2012a) used Rogers's (1983, 1995) Theory of Perceived Attributes as a framework to understand postgraduate students' adaptation of academics' teaching materials as OER. Similarly, Cox (2012) used Engeström's (1987) Activity Theory to frame the complex reasons for academics choosing to add teaching materials to the OER directory at the University of Cape Town (UCT). Pegler (2012) suggested that reuse of OER may be dependent on technical, motivational and quality factors. Thus, all aspects of attitude, motivations, perceptions of quality and perceptions of barriers are useful for studying the academic values and practices of OER in India. The present study undertook an exploratory examination of a conceptual model for understanding university teachers' OER practices (use and contribution) as intertwined psychological constructs of their attitudes, motivations, and perceptions of quality and barriers (Fig. 1.1).



**Figure 1.1:** Conceptual framework for teachers' use and contribution of OER

### *Attitudes*

Attitude is defined as a predisposition or tendency to respond positively or negatively towards a certain idea, object, person or situation. Attitude influences an individual's choice of action and their responses to specific stimuli. Zimbardo and Leippe (1991) defined attitude as “[a]n evaluative disposition toward some object based upon cognitions, affective reactions, behavioral intentions, and past behaviors... that can influence cognitions, affective responses, and future intentions and behaviors” (p. 15).

Attitudes are latent and not directly observable, but they provide direction to actions and behaviours that are observable. We can measure the attitudes of teachers toward



the concept of OER as a theory of reasoned action covering intention, belief, habit and evaluation of likely outcomes. The OER movement is based on individuals' desire to borrow and share resources. Rolfe (2012) reported that higher numbers of female staff members shared and borrowed compared to male colleagues. While about 50% of staff obtained resources from the Internet, only 12% placed resources online to make them globally available. New staff members had greater concerns over copyright and were more positive towards borrowing resources as a cost-saving measure, whereas longer-standing members of staff considered it difficult to adapt resources to suit particular contexts. Venkaiah (2008) reported a positive attitude towards OER in a study of Indian universities. He further concluded that this positive attitude has not led to increased use of OER in teaching and learning.

### ***Motivations***

Motivation is the study of why people think and behave as they do. People do certain things to satisfy their needs, and that motivates them to behave or do things in a particular way. Motivation can be intrinsic and extrinsic. Intrinsic motivators are related to the actual performance of an individual, such as achievement, responsibility and competence, whereas extrinsic motivators are those such as pay, promotion, feedback, working conditions and so forth. An individual can have different motivators and de-motivators. To help people perform optimally within a system, it is essential to reduce de-motivators and inculcate motivating factors.

“Understanding the motivations and characteristics of potential users is important to develop strong and sustainable strategies and practices” (Rolfe, 2012, p. 10) for OER. While market positioning seems to be the key purpose of OER for senior managers in institutional contexts, academic staff view “OER in terms of educational standards and opportunities” (Nikoi & Armellini, 2012, p. 173). Hylén (2007) examined four motivations for teachers to use OER: (i) knowledge sharing as a basic academic value, (ii) the increase in personal reputation in an open community, (iii) being a leader in their field and (iv) little value being derived from keeping the resource closed. According to Hilton and Wiley (2010), the four major motivations for using OER are to: (i) receive increased exposure, (ii) do some good, (iii) give new life to out-of-print works and (iv) improve the quality of educational resources.

### ***Barriers***

Despite positive attitudes and motivations for using OER, teachers find it difficult to do so, for varieties of reasons, including institutional policies, technological difficulties and poor understanding about OER per se. In order to have an enabling environment for the adoption of OER, it is necessary to reduce the real as well as perceived barriers. Barriers cited include “the lack of awareness about OER; the university elitism that it was not invented here so we'll use our own; faculty resistance given ‘my content is king in my kingdom’; and of course the lobbying of many publishers who see the OER movement as a threat to their historical business monopoly over content” (Olcott, 2012, p. 284). Hilton and Wiley (2010) posit four common obstacles to using OER: (i) the amount of time necessary to put the OER in a format that can be

shared, (ii) a desire to keep the resource from being seen by others, (iii) few, if any, external reward mechanisms for creating OERs and (iv) concerns in some educators that nobody will want to use the OER they create.

### ***Quality***

OER are “useful for improving teaching quality in areas such as providing illustrations, teaching difficult subjects, and supporting student progression” (Nikoi & Armellini, 2012, p. 176). However, teachers are concerned about using OER without a way to ensure the reliability or quality of open content (Richter & Ehlers, 2010). Many teachers also have feared that “their resources were not good enough to be shared openly and that by releasing teaching materials they were making themselves vulnerable to receiving overly critical feedback from their colleagues” (Brent, Gibbs, & Gruszczynska, 2012, p. 6). In the context of this study, quality is defined as a characteristic of OER that teachers view from their individual perceptions of value, worth and fitness of purpose.

## **1.5 Organisation of the Chapters**

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The research was conducted with the support of a grant from the International Development Research Centre, Canada through the University of Cape Town in South Africa. We present the findings of the study in the following chapters. First we present the findings of each of the construct in the study, and then provide analysis of the interaction of some of these constructs using Activity Theory framework. We discuss the research design of this study in the next chapter. While the study adopted methodological rigour to reach the conclusions, there is scope for further research using the research design adopted in the study to replicate and increase the body of research and thereby understand the complexities of OER use and contribution.

# Research Design

## 2.1 Introduction

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A research design provides the blueprint for the whole research process. It is a planned and structured way to determine, comprehensively, how a given research study will be carried out. According to De Vaus (2001), “research design” refers to the overall strategy for integrating the different components of a study in a logical way to ensure that the research problem is addressed effectively; it is the blueprint for the collection, measurement and analysis of data.

This chapter describes the: research objectives; research context (population and sample); methodology; tools and techniques for data collection (workshop design, questionnaire, interview schedule); and approaches to data analysis and interpretation.

## 2.2 Research Objectives

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The objectives of this research were to:

1. Examine teachers’ attitudes towards OER in select Indian universities;
2. Establish teachers’ perspectives on OER use in order to determine the uptake of OER in India;
3. Identify barriers to the creation and use of OER in India;
4. Identify the factors motivating teachers’ uptake of OER in India;
5. Analyse teachers’ perception of OER quality in India; and
6. Investigate the relationships amongst teachers’ attitudes, motivations, perceptions of quality and barriers to the use of OER.

## 2.3 Operational Definitions

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**Attitudes:** Attitude is defined as a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person or situation. In the context of

OER, it is anticipated that attitudes are latent and not directly observable, but they provide direction to actions and behaviours that are observable.

**Barrier:** A barrier is defined as a process or factor which hinders an individual from using and contributing to OER. It may be either real or perceived.

**Contributors:** For the purpose of this research, contributors refers to those teachers who have created, reused, revised, remixed and/or redistributed (shared) OER.

**Motivation:** Motivation is defined as the process or factor that pushes an individual to accomplish a task. It is necessary to remove demotivating factors as well as encourage motivating factors to accomplish a task. For the purpose of this research, motivation refers to the summative intrinsic and extrinsic motivations for using and contributing to OER. Intrinsic motivation is defined as using and contributing to OER for the inherent satisfaction of sharing rather than for some separable consequence. Extrinsic motivation pertains to using and contributing to OER in order to attain some separable outcome (definitions modified from Ryan & Deci, 2000). The presence of motivational factors enhances using and contributing to OER.

**Non-contributors:** For the purpose of this research, non-contributors refers to teachers who have never distributed/shared educational material under an open licence. He/she may, however, have used, revised or remixed OER.

**Non-users:** For the purpose of this research, the term non-users refers to teachers who have never used (downloaded, read, shared, revised, remixed) OER.

**OER:** OER (open educational resources) refers to full courses, course modules, syllabi, lectures, homework assignments, quizzes, lab and classroom activities, pedagogical materials, games, simulations and other materials shared with an explicit and appropriate open licence for teaching, learning and research, in digital (online and offline — e.g., DVD or CD-ROM) and/or non-digital format.

**Quality:** Quality is defined as a characteristic of OER that teachers view from their individual perception of value/worth/fitness for purpose.

**Users:** For the purpose of this research, the term “users” refers to teachers who use (download, read, share, revise, remix) OER.

## 2.4 Methodology

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In order to achieve the research objectives, we decided to undertake both qualitative and quantitative approaches. We used third-generation Activity Theory (Engeström, 1987) as an anchor for our qualitative data gathering and analyses, and we designed survey tools for quantitative data collection. As the field of OER is still emerging and quite new in many institutions, there are many critical issues to be resolved if OER is to be adopted and institutionalised. Therefore, a mixed research approach was considered suitable to gather data and critically evaluate the

positions with respect to subjects, objects, tools, division of labour, community, rules and so forth that may influence teachers' perceptions and belief system about sharing educational materials. To collect the data, we developed two tools: (i) a questionnaire and (ii) an interview schedule.

### 2.4.1 Activity Theory Framework

The third-generation Activity Theory (AT) framework (Engeström, 1987) can be used to discuss the whole process from OER creation to consumption, as it includes the four dominant aspects of human activity — production, distribution, exchange and consumption. Figure 2.1 presents an overview of the issues within this approach. To complement the AT framework, we also use Vygotsky's (1978) idea of a mediating tool. Along with subject and object these are: the *rules* — the “norms, conventions and values” that “represent a way of minimizing conflicts in an activity system” and “affect how the subjects move towards the object and how they interact within a *community*”; the *community*, “a larger group including the subject,” where “learning is situated” and participants “share the same objects, are governed by rules and divide tasks”; and the *division of labour*, which “is related to the organisation of the community,” “comprises roles, tasks and power relationships in an activity system” and “mediates between the objects and the community” (Buchem, Attwell, & Torres, 2011, p. 8). In this study, a broad view of AT is applied with respect to OER creation, distribution, exchange and consumption, as it is relevant in the context of OER to incorporate the different perspectives of user, non-user, contributor and non-contributor.

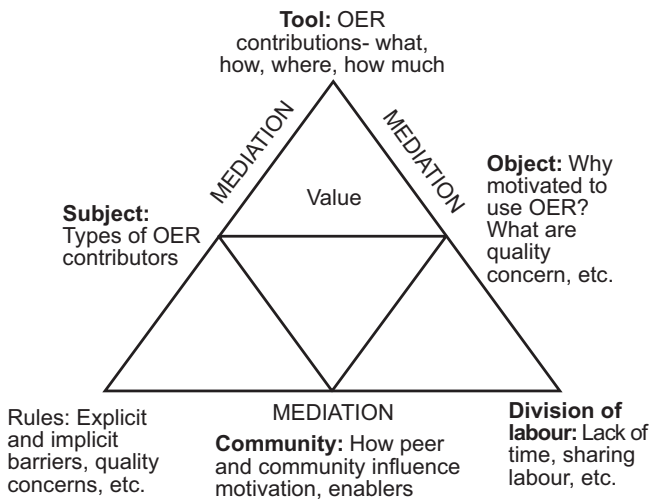


Figure 2.1: Engeström's Activity Theory, adapted to the present research on OER

### 2.4.2 Questionnaire Development

Our overall objective was to understand why some teachers share their work and some do not, and also why some teachers reuse, revise, remix and redistribute OER.

Based on a review of literature, the research team gathered sufficient information on previous research in the field and developed a questionnaire consisting of five major parts: Part A pertained to demographic details and consisted of 16 items prepared based on the Question Harmonization sessions of ROER4D groups while keeping the contextual aspects of the Indian higher education system. Part B consisted of an attitude towards OER (ATOER) scale containing 26 items (which was reduced to 17 after validity and reliability tests). Part C covered questions assessing motivation for using and adopting OER. This section consisted of 19 items, primarily based on intrinsic and extrinsic motivation. Part D dealt with perceptions of OER quality. This section contained 13 items primarily focusing on different criteria for defining OER quality. Part E focused on barriers in the use and adoption of OER. This part consisted of 18 items divided into seven sub-themes of barrier: technical, personal, institutional, financial, socio-cultural, linguistic and legal barriers. A five-point Likert scale was used in Parts B, C and D, with responses of Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. For Part E, respondents were asked to select only five barriers out of the given 18 barriers and rank them in order of decreasing relevance or significance on a scale of 1 to 5. Thus, the complete questionnaire contained a total of 83 multiple choice questions and required about 25 to 30 minutes to complete. Appendix 1 provides a sample questionnaire (with modified ATOER scale). The questionnaire was sent to 10 experts for validity and was piloted with 40 teachers to refine the questions. While the draft questionnaire served our purpose, some faculty offered suggestions on language use and the ranking of the barriers, which were incorporated into the final questionnaire. While this questionnaire was used for data collection, we only used a revised version of the attitude scale for reporting the research work. As there was no standard attitude measurement scale available for OER, we used this opportunity to develop this tool in a systematic manner. A detailed description of our methodology for developing the ATOER scale is given in the next chapter. The attitude scale has 0.897 reliability coefficient Cronbach's  $\alpha$  for the whole scale, which has two sub-scales, and the reliability coefficients are 0.893 and 0.715 for Sharing and Adaptation, respectively. The questionnaire used for data collection is robust and provides valid and reliable data for the study.

### **2.4.3 Interview Schedule Development**

We used the Activity Theory framework to develop the interview schedule. Initially, our research team developed a draft interview schedule, which was reviewed and critiqued by the experienced team of SP4 researchers based at University of Cape Town. With the input from the SP4 research team, who had more experience with using the Activity Theory framework, the final draft was discussed in a combined full-day workshop of the SP3 and SP4 teams in the presence of an OER consultant, to assist in the finalisation of the interview schedule. The consultant also played the role of user, and mock interviews were carried out to check that the questions were worded correctly and understood in the same way by all. The final interview schedule is given in Appendix 2.

## 2.5 Research Context (Population and Sample)

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In order to carry out the study in Indian universities, and within the constraints of available resources, sample institutions were identified that would represent the overall contexts of higher education teachers in India, which has over 700 universities. We identified the following four types of university at which to undertake the study:

- *One state open university*: At the time of the research, this was the youngest open university in India, situated in the north-east of India and offering courses only through the distance mode. While the university uses printed texts as study materials, the awareness of OER is moderate.
- *One dual-mode central university*: This university is located in a large metropolitan city in central India and offers programmes both at a distance and face-to-face. It has several regional centres spread across the country and operates largely in the Urdu language. The awareness of OER is relatively low, although the teachers engaged in distance teaching have been developing printed text materials for the learners.
- *One face-to-face university*: This is an affiliating university located in a semi-urban locality and caters largely to students from rural areas in the south-east of India. Awareness of OER is extremely low.
- *One multi-campus private university*: This university's headquarters is located in a district away from the capital city of the state in eastern India. But it has multiple campuses in the state. We conducted the workshop at the capital campus located in the outskirts of the city. It has relatively young faculty members who teach face-to-face. Awareness about OER is extremely low.

We identified these universities due to our access to top leadership there, and we gained permission to conduct the research with their faculty. We conducted workshops with selected faculty there to provide a developmental orientation to OER during the process of the research. We also circulated the questionnaire amongst the vibrant community of WikiEducator – India<sup>3</sup> to gather data for our research.

The teachers (practitioners) were classified into different categories on the basis of their linkages with OER space: users and non-users of OER, and contributors and non-contributors to OER, as shown in Figure 2.2.

At the time of research, there were 107 members in the WikiEducator – India community, and while the four universities had several hundred teachers, we conducted the research with about 30 teachers from each of these universities. These teachers were identified by the universities' senior management. The researchers asked the management to give equal representation to women teachers in the sample. Thus, we had a sample of 227 teachers for our study. We received 148 responses to the survey, of which only 117 could be used (of these, 42.7% were female respondents and 57.2% male).

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<sup>3</sup> <http://wikieducator.org/India>

	<b>Contributor</b>	<b>Non-contributor</b>
<b>User</b>	<b>One who uses OER and also contributes</b>	<b>One who only uses OER but does not contribute them</b>
<b>Non-User</b>	<b>One who only contributes OER but does not use them</b>	<b>One who never uses or contributes OER</b>

**Figure 2.2:** Types of OER practitioners

## 2.6 Data Collection

Data collection for the study was done through online and offline versions of the questionnaire and through interviews. While the online questionnaire was created using SurveyMonkey<sup>4</sup> and distributed via email web link, the offline questionnaire distribution was done during the workshop conducted in the four research locations. We used the workshops to orient the participants about OER as well as to administer the questionnaire and identify participants for interviews. The selection of participants for the interview was largely voluntary and therefore subject to self-selection bias; the research team also asked some of the interviewees to participate. We used the workshop as an innovative way to gather data as well as provide orientation in an emerging and developing area of study and research. The use of our workshop method could be considered a modified and extended focus group discussion. A detailed description of the approach we followed is given below.

### 2.6.1 Workshop as Data Collection Method

We adopted a workshop method for data collection in the present study. The “Workshop on Open Educational Resources for Development” was designed to provide teachers’ understanding of OER and to collect data for our research; hence, it was designed to be participatory and focused on assessing the constructs of the research in addition to providing a basic introduction to OER. Each four-day workshop had the following specific objectives:

- To assist the participants in understanding the history and development of OER; and
- To enable the participants to appreciate the need for OER in their work environment and facilitate an appreciation of the importance of open licences for educational materials.

The first workshop was conducted in collaboration with Maulana Azad National Urdu University (MANUU), Hyderabad, which is engaged in both conventional and

<sup>4</sup> <https://www.surveymonkey.com/>



distance mode teaching. The second workshop was conducted in Guwahati (north-east India) in collaboration with Krishna Kanta Handiqui State Open University (KKHSOU), Assam, which is the only state open university in the whole of north-east India. The third workshop was conducted in collaboration with Krishna University at Machilipatnam, Andhra Pradesh, which is situated around rural settings and thereby introduced a balance in the sampling of the present research. The last workshop was held at Bhubaneswar in collaboration with Centurion University of Technology and Management (CUTM), Odisha, which is a private, multi-campus university offering different professional courses on technology and management.

The different types of strategies adopted in the workshop for data collection are given below.

### ***Just-a-Minute Sessions***

“Just-a-minute” (JAM) sessions were planned to understand teachers’ positive and negative attitudes towards OER. Each session was designed to elicit from teachers an immediate response, within one minute, about their positive/negative views on OER. All of the participants were given, in advance, five minutes to write down a statement that began with, “I am positive/negative about OER because...” While they had sufficient time to articulate their response, we only recorded the first minute, to gain a snapshot of their perceptions about OER.

### ***Interactive Quiz Sessions***

To understand the motivations of teachers for using OER, we conducted interactive question-and-answer sessions. The questions related to their motivation or demotivation for adapting/participating in OER, as well as the benefits of OER for the teaching and learning processes. This helped to create an engaging environment for participants to critically question the benefits of OER and ask why OER might be useful for them.

### ***Snowball Sessions***

In order to list the barriers to using and sharing educational materials, we engaged the participants in a snowball exercise, whereby they were given five minutes to write down the barriers relevant to them. In the next stage, the participants discussed the common barriers in dyads, then in groups of four, each for about five minutes, to develop a consensus on a list of barriers. For logistical reasons, some groups had six members in the third level of the snowball session. The discussions were then shared using a flip chart. Some of these are provided in Appendix 3.

### ***Panel Discussions***

To assess the perceptions of teachers about OER quality, we organised panel discussions. In each of the workshops, the research team identified four to five persons from amongst the participants and asked them to be panellists. This was done the day before, so the panellists had little time for preparation and therefore would speak from their personal beliefs and understanding rather than from the established

literature. They were also informed that their positions could be questioned by participant teachers in the audience. During the panel discussion, each panellist was asked a set of questions by a moderator (one of the research team members). In these sessions, panellists and other participants discussed concerns related to definitions of quality, indicators of quality OER, the need for quality in OER, who should ensure quality in OER, and other relevant topics.

During all of these sessions, research associates recorded the conversations using digital audio recorders and also noted the contexts for further analyses. At the end of each workshop, the questionnaire was distributed, and participants were asked to return the filled-in questionnaire. While we asked all to complete the questionnaire, we made it clear this was voluntary. The main workshop ended in three days, so day four was devoted to conducting the interviews with selected participants. We also identified six to eight participants in each of the locations to be part of the interview process. Interviews were conducted by the research team using the interview schedule. Prior to the interview, each of the participants was requested to provide informed consent in the format given in Appendix 4. All the interviews were recorded digitally for further processing.

## 2.7 Data Analyses and Interpretation

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The data were collected from 148 respondents through administering the questionnaire during the workshop as well as online. The data were then filtered to standardise them according to the ATOER scale, and 117 respondents were extracted for further data analysis. The general demographic information was provided by all the participants and could further be subdivided into three parts to create a demographic profile: personal and professional information; institution information; and OER-based information. The personal and professional information included their age group and gender, level of position, subject discipline, higher qualification, years of experience, nature of job and medium of instruction. The nature of the institution — i.e., face-to-face, distance or dual-mode — and the number of students were the part of institutional information, while questions about OER use and contribution gathered the OER-based information.

The data collected were analysed and presented in the chapters 4 to 9 in this monograph in a thematic manner. While statistical analyses were carried out to answer the research questions on the data collected, we coded the qualitative data for analyses using 39 codes, as per Appendix 5. The interrater reliability was calculated, indicating a kappa coefficient value of 0.82 ( $p < 0.001$ ) on the basis of sample coding done by the research team. This showed substantial agreement between coders, as per the interpretation guide by Viera and Garrett (2005). We analysed the data using Dedoose<sup>5</sup> software for content analysis and to draw meaningful interpretations.

The next chapter presents the development and validation of the ATOER Scale.

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<sup>5</sup> <http://www.dedoose.com/>

# ATOER Scale Development

*This chapter is a modified version of the paper published in Open Praxis. For details, see: Mishra, S., Sharma, M., Sharma, R.C., Singh, A., & Thakur, A. (2016). Development of a Scale to Measure Faculty Attitude towards Open Educational Resources, Open Praxis, 8 (1), 55-69.*

## 3.1 Why Develop a Scale?

Developing a measurement scale that is valid and reliable is always challenging. Several scholars argue that effective measurement is an underpinning of research (DeVellis, 2003; Netemeyer, Bearden, & Sharma, 2003). Besides that, reliable and valid measures contribute to the legitimacy and development of a research field (Reynolds, 2010). Also, empirical articles that use rigorous methodological procedures, besides being firmly grounded in theory, receive more citations (Colquitt, & Zapata-Phelan, 2007).

Research in OER field is quite recent and is not common due to lack of awareness, funds to support researches and other contextual dynamics. There is also a dearth of empirical research that follows sound methodological approaches. One Indian study by Venkaiah (2008) examined attitude and perception of distance teachers towards OER using a scale that was not subjected to psychometric validation. Researchers on OER have yet to adopt rigour in conduct of empirical studies as in other fields of education. It could be due to its emerging nature or being rooted within Educational Technology, Information Communication Technology (ICT) and e-learning rather than as an independent field.

The motivation for this research springs from gaps in earlier researches related to OER. Whatever research on attitude towards OER are available, they do not try to investigate underlying constructs. Content domain specification, and item pool generation are not explained in detail. While much importance has been given to questionnaires and interview schedules, very few used scaling techniques to measure attitudes. Moreover, relevant research findings were not always utilized for constructing sound scale to measure faculty attitude towards OER.

Building on the methodological inadequacies of previous works, we developed a rating scale called Attitude towards Open Educational Resources (ATOER) that can precisely identify positive and negative pre-dispositions to the concept and practices of OER amongst teachers. Analyses of review provided a basis for developing three major constructs for ATOER scale – awareness, sharing of resources, and adoption and use of OER (discussed in the next chapter).

## 3.2 Methodology

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This section outlines the steps for validity, reliability and optimisation of ATOER scale undertaken in this study. The methodologies used are elaborated below for each step:

### 3.2.1 Domain Identification and Item Generation

Generation of items is the most important element of establishing sound measures (Hinkin, 1995). In the process of developing ATOER scale, initially 65 statements were pooled from review of literature and classified in to three main themes – Awareness, Sharing of resources and Adoption and use of OER. Afterwards, to avoid duplication, and have clarity, only 26 statements were selected through sorting process based on rigorous discussions within the internal research team. These 26 statements were subjected to content validity by research team. A pool of 30 experts was drawn from the research literature and various projects such as WikiEducator and the Research on OER for Development (ROER4D) group.

### 3.2.2 Content Expert Validation

This study used Content Validity Ratio (CVR) proposed by Lawshe (1975) to identify valid statements. This was accomplished in three stages:

At first stage, only 30 experts were selected to express opinion on suitability of the identified 26 statements to measure attitude towards OER. They were asked to rate the statements in a three point scale (1= Not necessary, 2= Useful, but not essential, and 3= Essential). We used an online survey tool to collect data, and experts were also given a brief about context of the research. CVR was calculated as described by Lawshe (1975) to assess the content validity.

Followed by first stage, CVR was re-calculated combining both ‘Essential’ and ‘Useful, but not necessary’ ratings to give a combine value of  $CVR_{E+U}$  at Second stage. This is a modified CVR approach (Kawachi, 2014b).

At third stage, ATOER scale was further revised by adding more clarifying items. Language of scale was further simplified, and it had 34 items. At this stage, we also separated items of the three constructs and sent to the 30 experts, which resulted in only four additional responses.

We conducted another round of analysis as the number of response in stage 3 was less. At this stage the average value of  $CVR_{E+U}$  of second and third stage for all the items was calculated, and 8 items (item no.2, 3, 13, 20, 27, 28, 29 and 34, from the third stage) were omitted owing to their low  $CVR_{E+U}$  value. A final valid scale with 26 items was thus finalized for next level of tests.

### 3.2.3 Administration of the Items to a Development Sample

The scale with 26 items was distributed online as well as in four face-to-face workshops on OER conducted in four different Indian universities. Each of the workshops was attended by about 30 teachers, and we sent the online survey to about 150 OER practitioners on the WikiEducator India list. Tinsley and Tinsley (1987) suggest a ratio of 5 to 10 subjects per item, i.e. up to a sample size of about 300 for factor analysis. Thus, distribution of the questionnaire containing 26 items to a sample size of 270 was considered satisfactory, and a large sample would eliminate subject variance (DeVellis, 2003) for scale development. However, only 117 (43%) usable responses were received. Though this was considered as a limitation at this stage, the analysis of the responses found that this return rate was adequate for this instrument.

Detailed analysis of the psychometric properties of the scale for validity and reliability, including factor analysis are described in the next section.

## 3.3 Results and Analysis

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### 3.3.1 Validity of Items in the Scale

In order to examine the validity of ATOER scale, Content Validity Ratio (CVR) was calculated in four stages. Findings and analysis of each stage are discussed below:

**First Stage:** A total of 19 experts out of 30 responded. However, only 15 responses were found to be complete. On the basis of the data, CVR was calculated to be -0.18 which is very less than critical value of 0.49 at  $p < 0.05$  level for 15 experts (Table 3.1). The draft thus shaped was termed Draft-I.

**Second Stage:** Analysis and discussions on Draft-I draws attention to the speculation that respondents might have ranked the items as 'Useful, but not necessary' instead of 'Essential' without understanding that items ranked as 'useful' but not necessary will be removed from final scale (Lawshe, 1975). This misperception between 'Useful, but not essential' and 'Essential', also resulted in low CVR. Therefore in second stage the CVR is re-calculated combining both 'Essential' and 'Useful, but not necessary' ratings to give a combine value of  $CVR_{E+U}$  (Kawachi, 2014b). The  $CVR_{E+U}$  of scale is calculated to be 0.62, which is more than critical value of 0.49 at  $p < 0.05$  level for 15 experts at 0.05 level. The draft shaped after second stage was termed Draft-II.

**Third Stage:** Only 4 experts responded at this stage. This low response may have been avoided by providing background of this research study and explaining the three constructs to the experts. However, the validity process expects un-influenced opinion on the items.  $CVR_{E+U}$  of revised scale was 0.68. Additionally, the calculated value of  $CVR_{E+U}$  is 1.00 for most of the new items (Table 3.1). The draft shaped after this stage was termed Draft-III.

**Table 3.1:** Stage-wise Items and CVR

Stage-I	Stage-II	Stage-III	Items	CVR (Draft-I)	$CVR_{E+U}$ (Draft-II)	$CVR_{E+U}$ (Draft-III)	CVR Combined II-III stage (Draft-IV)
1	1	1	I have prior experience of using OER	0.7	1.0	1.00	0.73
2†	2†	2†	All teaching resources available on internet are OER	0.0	0.0	0.00	-
3†	3†	3†	All resources are OER such as video, audio, text and so on	0.0	-0.5	-0.50	-
4	4	4	OER means no need to ask any further permission to use them	0.5	0.5	0.50	0.52
5	5	5	OER means the resource is openly licensed	0.8	1.0	1.00	0.81
		6*	OER means learning resource is freely available to be used by anyone		1.0	1.00	1.00
		7*	OERs are digital or non-digital materials that can be re-used for teaching/ learning/ research		1.0	1.00	1.00
6	6	8	I have knowledge of Intellectual Property Right to understand OER	0.5	1.0	1.00	0.62
7	7	9	Sharing of educational resources improves my professional respect	0.8	0.5	0.50	0.70
8	8	10	It gives me pleasure if someone adopt/adapt my educational resources	0.9	1.0	1.00	0.90
9	9	11	Sharing helps me to get feedback	1.0	1.0	1.00	1.00

*Contd...*

Stage-I	Stage-II	Stage-III	Items	CVR (Draft-I)	CVR <sub>E+U</sub> (Draft-II)	CVR <sub>E+U</sub> (Draft-III)	CVR Combined II-III stage (Draft-IV)
10	10	12	Sharing enhances my personal and organizational reputation	1.0	0.5	0.50	0.90
11†	11†	13†	I share resources with trustworthy people	0.1	0.0	0.00	-
12	12	14	Sharing of educational resources increases my profile amongst peers and others	0.9	0.5	0.50	0.80
13	13	15	OER increases my network and sphere of influence	0.9	1.0	1.00	0.90
14	14	16	As a teacher, it is my responsibility to share all educational resources created by me	0.9	0.5	0.50	0.80
15	15	17	OER helps me to reach out to more students	1.0	1.0	1.00	1.00
16	16	18	OER improves my chance of recognition at global level	1.0	0.5	0.50	0.90
17	17	19	I believe that sharing educational material as OER will encourage others to do so	1.0	0.5	0.50	0.90
18	18	20**	Sharing of OER amongst colleagues encourages self-reflection	1.0	-0.5	-0.50	-
		21*	Sharing enhances my confidence as I see myself in part of larger community		1.0	1.00	1.00
		22*	When others use my OER, it improves my sense of achievement		1.0	1.00	1.00
		23*	OER helps to disseminate my ideas		1.0	1.00	1.00
		24*	I can use OER easily due to its reusability		1.0	1.00	1.00
		25*	I use OER as they are available at reduced cost		0.5	0.50	0.50

*Contd...*

Stage-I	Stage-II	Stage-III	Items	CVR (Draft-I)	CVR <sub>E+U</sub> (Draft-II)	CVR <sub>E+U</sub> (Draft-III)	CVR Combined II+III stage (Draft-IV)
		26*	OERs are easy to use as they are accessible		1.0	1.00	1.00
22	22	27**	Sharing of work could expose my deficiencies	0.1	1.0	1.00	-
24†	24†	28†	I do not want to undergo any peer inspection	0.4	0.5	0.50	-
25†	25†	29†	Educational materials developed for my student will not serve any purpose for others	0.4	0.5	0.50	-
26	26	30	OER promotes collaboration and consortia	0.3	1.0	1.00	1.00
		31*	I am efficient in Information Communication Technology (ICT) skills to adopt and use OER	1.0	1.0	1.00	1.00
		32*	I adopt OER for my teaching as they fulfil academic requirement of my students		1.0	1.00	1.00
		33*	My own competencies and knowledge towards OER helps me to participate or adopt OER		1.0	1.00	1.00
		34**	My work gets visible to others, if I use OER		0.0	0.00	-
<b>Average CVR Value</b>				-0.18	0.62	0.68	0.88

\* Items added in Draft-III

\*\* Deleted items based on low CVR

† Deleted items with Negative Statements

**Fourth Stage:** At this stage, 8 items (item no. 2, 3, 13, 20, 27, 28, 29 and 34, from the third stage) were omitted owing to their low CVR<sub>E+U</sub> value. The average calculated value of CVR<sub>E+U</sub> for 26 items was 0.88, which is more than critical value of 0.42 at  $p < 0.05$  level for 20 experts. This was considered to be satisfactory for further statistical tests.



### 3.3.2 Exploratory Factor Analysis and Reliability of the Scale

The 26 item scale was subjected to reliability test using two methods that showed Cronbach's alpha at 0.897 and Guttman Split-Half Coefficient at 0.790, which provided a confidence that the items in the scale are interrelated and are measuring the same attribute, i.e. Attitude towards OER. With this we were interested in analyzing the three constructs of the scale: Awareness, Sharing and Adaptation.

Before undertaking factor analysis, we conducted Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy. Kaiser (1974) recommended that KMO values between 0.8 and 0.9 are great, and Table 3.2 shows KMO value of 0.82 for the data used in the study. This gives confidence that the sample size is adequate for factor analysis. Also, the Bartlett's test of Sphericity reveals that it is highly significant ( $p < .001$ ), indicating that there are some relationships between the variables.

**Table 3.2:** KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.823
Bartlett's Test of Sphericity	Approx. Chi-Square	1.239E3
	Df	325
	Sig.	.001

Factor analysis of the 26 item scale using principal component analysis method assuming three factors confirmed the assumption showing only 21 items with factor loading more than 0.5 or greater. Table 3.3 shows the 21 items with factor loading ranging from 0.528 to 0.798. The Cronbach's alpha for the scale at this stage was 0.887.

**Table 3.3:** Three Factors of the Attitude towards OER Scale

The Item Statements	Factor 1	Factor 2	Factor 3
	Sharing	Adaptation	Awareness
Sharing of educational resources improves my professional respect	<b>0.504</b>	0.215	0.214
It gives me pleasure if someone adopts/ adapts my educational resources	<b>0.593</b>	0.086	0.341
Sharing helps me to get feedback	<b>0.643</b>	-0.031	0.234
Sharing enhances my personal and organizational reputation	<b>0.717</b>	0.065	0.182
Sharing of educational resources increases my profile amongst peers and others	<b>0.577</b>	0.153	0.195
OER increases my network and sphere of influence	<b>0.688</b>	0.123	0.106
As a teacher, it is my responsibility to share all educational resources created by me	<b>0.510</b>	0.257	0.143
OER improves my chance of recognition at a global level	<b>0.745</b>	0.244	-0.036

*Contd...*

The Item Statements	Factor 1	Factor 2	Factor 3
	Sharing	Adaptation	Awareness
I believe that sharing educational materials as OER will encourage others to do so as well	<b>0.696</b>	0.238	-0.009
Sharing enhances my confidence as I see myself in part of larger community	<b>0.666</b>	0.166	0.128
When others use my OER, it improves my sense of achievement	<b>0.648</b>	0.154	0.142
OER helps to disseminate my ideas	<b>0.619</b>	0.184	-0.004
OER promotes collaboration and consortia	<b>0.576</b>	0.468	-0.048
I have prior experience of using OER	-0.174	<b>0.620</b>	0.025
I have knowledge of Intellectual Property Rights to understand OER	0.196	<b>0.541</b>	0.163
I am efficient in Information Communication Technology (ICT) skills to adopt and use OER	0.230	<b>0.682</b>	-0.018
I adopt OER for my teaching as they fulfil academic requirement of my students	0.240	<b>0.591</b>	0.275
My own competencies and knowledge towards OER helps me to participate or adopt OER	0.243	<b>0.700</b>	0.150
OER means no need to ask any further permission to use them	-0.040	0.123	<b>0.696</b>
OER means the resource is openly licensed	0.054	0.022	<b>0.725</b>
OER means the learning resource is freely available to be used by anyone	0.176	0.064	<b>0.607</b>
<b>Cronbach's alpha (Factors)</b>	0.898	0.734	0.626
<b>Cronbach's alpha</b>		0.887	

### 3.3.3 Scale Optimization

The correlation between these three factors (Table 3.4) revealed that factor 1 and 2 is positively correlated with moderate coefficient value 0.46, which is also significant at 0.01 level. On the other hand, factor 3 has a very low correlation with both factor 1 and 2. Cronbach's alpha for factor 1 is 0.89, which is good enough. Furthermore reliability coefficient of factor 2 and 3 are measured as 0.71 and 0.61 respectively. Thus, the correlation between all these factors and the reliability coefficient revealed that factor 3 is not correlated with factor 1 and 2; however, the Cronbach's alpha with 0.61 is acceptable but not good enough. Because of this, we decided to discard the factor 3 (with 3 items) from the scale.

Once it was decided to use the two factors with 18 items, we conducted inter-item correlation for both the factors (sub-scales). The standardized Cronbach's alpha for the 13 items in the Sharing scale was 0.898, while for the five items adaptation scale was 0.734. In Table 3.5 and 3.6, the values in the column labelled Corrected

Item-Total Correlation are the correlations between each item and the total score from the questionnaire. In a reliable scale all items should correlate with the total. We used the advice of Field (2009) to look for items with less than 0.3 to identify, if any item does not correlate very well with the overall scale. Interestingly for all the items, item-total correlations are above 0.3.

**Table 3.4:** Correlations between three factors

		Factor 1 (Sharing)	Factor 2 (Adaptation)	Factor 3 (Awareness)
Factor 1 (Sharing)	Pearson Correlation Sig. (2-tailed)	1		
Factor 2 (Adaptation)	Pearson Correlation Sig. (2-tailed)	.466** .000	1	
Factor 3 (Awareness)	Pearson Correlation Sig. (2-tailed)	.231* .012	.169 .069	1

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

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

**Table 3.5:** Inter-item Correlation – Sharing of OER Sub-scale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q7	52.6838	34.942	<b>.499</b>	.364	<b>.889</b>
Q8	52.5726	35.195	<b>.564</b>	.443	<b>.887</b>
Q9	52.6410	34.663	<b>.560</b>	.478	<b>.887</b>
Q10	52.7265	33.287	<b>.688</b>	.532	<b>.881</b>
Q11	52.8974	33.041	<b>.571</b>	.447	<b>.886</b>
Q12	52.8034	32.556	<b>.656</b>	.500	<b>.882</b>
Q13	53.1624	32.603	<b>.492</b>	.277	<b>.893</b>
Q15	52.8205	32.459	<b>.706</b>	.631	<b>.879</b>
Q16	52.9573	32.576	<b>.650</b>	.548	<b>.882</b>
Q17	52.7692	34.369	<b>.632</b>	.457	<b>.884</b>
Q18	52.8291	33.091	<b>.639</b>	.449	<b>.883</b>
Q19	52.9316	33.530	<b>.539</b>	.376	<b>.888</b>
Q23	52.9744	33.611	<b>.583</b>	.385	<b>.885</b>

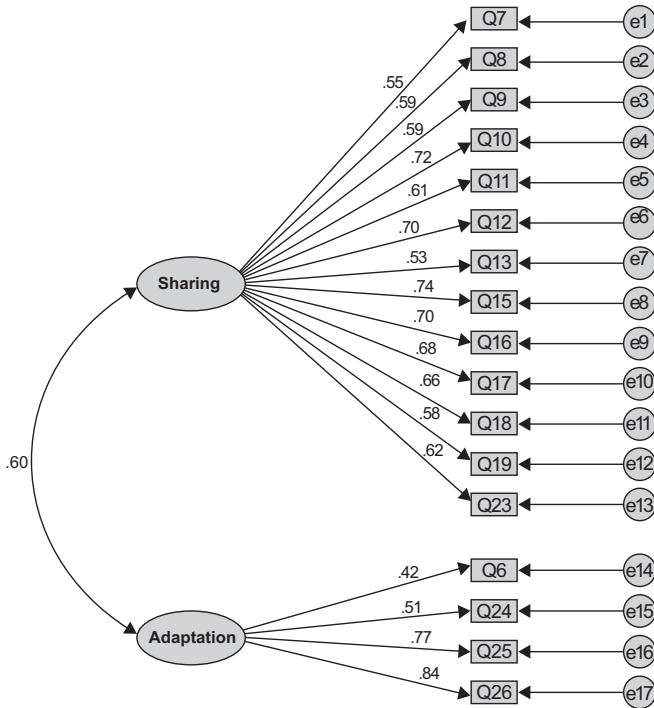
**Table 3.6:** Inter-item Correlation – Adaptation Sub-scale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	16.1453	6.487	<b>.396</b>	.169	<b>.715</b>
Q6	16.2821	7.153	<b>.441</b>	.219	<b>.676</b>
Q24	15.9145	7.303	<b>.521</b>	.311	<b>.646</b>
Q25	15.8803	7.434	<b>.483</b>	.474	<b>.660</b>
Q26	15.8120	7.378	<b>.588</b>	.532	<b>.629</b>

Once we were confident about the sub-scales, we conducted inter-item correlation for all the 18 items in the scale, and only one item showed correlation value of less than 0.3 (i.e. item 1 from the sub-scale Adaptation with 0.170). Further, the result indicated that deleting the item from the scale would increase the reliability score to 0.897. Therefore, the final number of items in the scale is 17 (with 13 items for Sharing and 4 items for Adaptation). For the sub-scales, the reliability co-efficient (Cronbach's  $\alpha$ ) is 0.893 and 0.715 for Sharing and Adaptation, respectively.

### 3.3.4 Confirmatory Factor Analysis

While the optimization process and reliability tests revealed a 17 item scale with high validity and reliability, we also conducted Confirmatory Factor Analysis (CFA) on the data set as in the beginning we had assumed three factors based on literature review and conducted the exploratory factor analysis. The process of scale development resulted in a two factor scale, and we wanted to analyse if the two factor model is a good fit. Thus, we followed Structural Equation Modelling (SEM) using SPSS AMOS. The SEM is used commonly to test whether measures of a construct are consistent with the researchers' assumption of the nature of the construct. Figure 3.1 shows the Path diagram of the CFA, which shows that the two constructs (sharing and adaptation) are correlated. There are several ways of determining model fit, and the common measure is to follow the chi-square ( $\chi^2$ ) goodness of fit. In this case the  $\chi^2$  value of 204,548 at 118 degree of freedom is high rejecting the model fit. However  $\chi^2$  is affected by the sample size, therefore  $\chi^2 / df$  ratio which in this case is 1.73 is used as a measure of good fit. Kline (2005) recommended that as a rule of thumb,  $\chi^2 / df$  values of 3.0 or less signify a good fit of the model. We further used the Root Mean Square Error Approximation (RMSEA) statistics for analyzing the model fit. For RMSEA, choosing a proper cut off value is critically important, and a widely used convention is that  $\leq 0.05$  refers to close fit,  $\leq 0.08$  mediocre fit, and  $> 0.10$  poor fit (see, e.g., Browne & Cudeck, 1992; MacCallum, Browne, & Sugawara, 1996). For our data the RMSEA value is 0.08, which indicates the model presents a mediocre fit and the proposed two factor model is plausible.



Chi-square	204.548
DF	118
Significance	0.001
CMIN/DF	1.733
RMSEA	0.080

**Figure 3.1:** Path Diagram of the Model

### 3.4 Discussions

The development of ATOER scale<sup>6</sup> with 17 items and two factors following a consultative process with valid and reliable statistics show that the scale can be used to measure what it is supposed to measure, i.e. attitude towards OER. While we started the analysis with only 117 responses, and considered it may be a limitation, the final scale with 17 items satisfactorily fall within the acceptable limit of sample size (Tinsley & Tinsley, 1987). The CVR score for the final scale is 0.9, and the Cronbach's reliability co-efficient  $\alpha$  is 0.897.

It is interesting to note that based on the literature review, we assumed a three factor model of attitude towards OER, and during the reliability tests, we dropped the items

<sup>6</sup> [http://roer.cemca.org.in/sites/default/files/ckfinder/userfiles/files/ATOER\\_Standardized%20Scale.pdf](http://roer.cemca.org.in/sites/default/files/ckfinder/userfiles/files/ATOER_Standardized%20Scale.pdf)

related to awareness. In retrospect, this looks obvious as mere awareness may not have influence on the overall attitude, and those sharing and adaptation behaviour are certainly manifestation of attitude towards OER. This has significance for the OER practitioners, as only advocacy and increasing awareness of OER may not help promote the cause of OER.

The two factors model using the data in the study revealed a mediocre fit, and therefore, we proffer that the scale is acceptable on the basis of its other psychometric properties. However, further tests may be needed with more data and other contexts to test the model fit. We could have further conducted modification indices to come-up with an acceptable model fit. However, as the exploratory factor analysis and reliability tests are sufficient for any scale development, we assume that the mediocre fit presents a plausible model that could be further tested by other researchers using the scale developed in this study.

The scale will help institutions to plan use of OER in teaching and learning by identifying positive and negative faculty attitudes. Policy makers and planners will be in a better position to manage change and implement an organization-wide OER strategy with an empirical understanding of the ground realities. As attitudes naturally change over time, it is possible for institutional administrators to change any negative pre-disposition among faculty through interventional information communication, training and implementing projects related to OER.

# Attitudes towards OER

## 4.1 Attitudes and OER

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Attitude is a key cognitive component that refers to an individual's favourable or unfavourable perceptions with respect to a specific subject/object (Ajzen, 1989). It is argued that attitudes influence our intentions to engage in behaviours, but that attitudes must be specific to a behaviour to have predictive power (Ajzen, & Fishbein, 1980).

Attitude is defined as “a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person or situation” (Mansour, 2012, p. 124). An individual acts and responds to specific stimuli under the influence of his/her attitude. Zimbardo and Leippe (1991) explored the interconnections within an attitude system, which include cognition, affect and behaviour. An evaluative or affective response to an object may be treated as an attitude (Thurstone & Chave, 1929).

In the context of OER, it is anticipated that attitudes are latent and not directly observable, but that they nonetheless guide actions and behaviours that are observable (Simonson, 1979). Teachers' attitudes towards the sharing of learning content are important for promoting their use of OER and their further contribution to the OER movement. Social learning theory (SLT) suggests that teachers' social environment, perceptions and peers' tendency to contribute are factors that determine an individual's level of contribution to a specific cause.

SLT extends these ideas by incorporating the roles of individuality and learning, and their interaction with people's attitudes, in terms of human behaviour (Wood & Bandura, 1989). SLT views behaviour as a reciprocal interaction between cognitive, environmental and behavioural processes. Thus, SLT recognises the influence of environmental factors and considers the individual's cognition as well as social influences and interactions. This approach proposes that behavioural learning occurs through both direct experience and observations of others (Bandura, 1989). There are several models available for adopting a new idea or technology, some of the more popular being the *technology acceptance model* (TAM), the *theory of reasoned action* (TRA) and the *theory of planned behaviour* (TPB). The underpinning assumption among all these theories is that social behaviours are volitional, thereby allowing

behavioural intentions to become a predictor of behaviour. The TAM represents the antecedents of behaviours that involve technology use. The acceptance of word-processor applications was first tested by the development of this model (Davis, 1989). The TAM is a multi-attribute approach, proposing that perceived usefulness and perceived ease of use are the key components in people's formation of attitudes towards technology use, consequently influencing their intentions and leading to behavioural outcomes.

The TRA (Fishbein & Ajzen, 1975) and the TPB (Ajzen, 1985) are the most common models for predicting and explaining information-sharing behaviours and intentions (Kuo & Young, 2008). In these theories, an individual's favourable or unfavourable attitude predicts their performance of a definite behaviour. It is suggested that these attitudes are based on beliefs concerning behavioural costs and benefits. Once these beliefs about outcomes are assessed, they become attitudes to effect intentions to act. Once established, subjective norms and beliefs about the expectation influence the individual's intentions to act.

According to Ajzen (1985), the last major predictor of behavioural intent is *perceived behaviour control* (PBC), which comprises control of belief and perceived power. According to TPB, PBC can predict behaviour over and above intentions when one is examining behaviours that are not under complete volitional control. Together, the three independent TPB factors incorporate *personal, social and external factors*. Each factor is assumed to be belief based, which leads to apparent variation in behavioural choice between individuals (Armitage & Conner, 2001).

On these premises, the attitudes of teachers towards the concept of OER are measured according to a theory of reasoned action covering intention, belief, habit and evaluation of likely outcomes. In the OER movement, knowledge-sharing behaviour is a product of positive attitudes and can help teachers in their professional development.

While looking at the literature to find research on attitudes, we included the theoretical framework of attitudes to identify relevant, substantial literature. There have been several studies on teachers' attitude towards OER, covering various factors that do or do not encourage them in contributing to OER. Some of the themes that have emerged in discussion are *awareness of OER, sharing and borrowing, and adoption and use of OER*. A *non-sharing* attitude also emerged as a distinct theme for gaining a comprehensive understanding of teachers' stances towards OER.

#### **4.1.1 Awareness of OER**

Various studies have found awareness to be one of the major components of teachers' attitudes toward OER. These studies have investigated and assessed teachers' attitudes in relation to their awareness of and participation in the development of OER. Some studies have revealed that many teachers are not even aware of the concept and meaning of OER; others are aware of the concept but unsure about copyright. There



are also teachers who have knowledge of both OER and copyright but are unable to share or use their resources because they lack technological skills.

A recent study by Jameela (2014) attempted to determine teachers' awareness of OER. The study targeted a group teaching at teacher training institutes affiliated with the University of Calicut. This study revealed that awareness about OER is relatively poor, so OER are not properly used and shared by teachers. Prasad and Usagawa (2014), in their study in South Pacific, found that the majority of the teachers (82%) admitted having an awareness of OER but insufficient knowledge of its benefits. Regardless of teachers' familiarity with OER, 31.25% reported never to have used OER, while of the 68.75% who claimed to have used OER, only 12.50% utilised OER to a great extent. In another study, 79% of teachers responded that they had never included OER in their courses, while 21% used various OER repositories, such as the Directory of Open Access Journals (DOAJ), MIT OpenCourseWare, Khan Academy and Google Scholar, when preparing learning resources (Mtebe & Raisamo, 2014b). A recent study in South Africa found that 73.5% of the teaching staff reported being aware of OER and that this high level of awareness was accompanied by comprehensive understanding (Hart, Chetty, & Archer, 2015).

Awareness of OER is relatively less widespread amongst academics than awareness of other digital resources (Rolfe, 2012), although OER are considered "a bottom-up phenomenon, where the managerial level of the institutions is not involved and not aware of the activities going on" (Hylén 2006, p. 52). Some teachers understand the term OER but are not particularly concerned about the benefits of OER for education (Rolfe, 2012). Similarly, Reed's study (2012) noted that 32% of respondents were aware of Jorum, while only 19% were aware of the term "open educational resources." In a recent study, 73.5% of the instructors were aware of the OER movement, but the majority of participants had rarely or never used OER to enhance their courses (Mtebe & Raisamo, 2014b). The concept of OER is not necessarily clear to teachers; they usually download materials — particularly images or multimedia — from the Internet (Masterman & Wild, 2011).

There is a correlation between teachers' educational values and their tendency to be involved with open education practices. Karunanayaka and Naidu (2013) reflected on the perceptions and perspective of teachers towards the concept and awareness of OER at different stages of a capacity-building process — the initial stage, midway and at the end. Initially, the OER concept was strange to many teachers. They became aware of OER and gained knowledge due to their engagement with workshops based on OER. They developed new knowledge, perceptions and attitudes towards OER gradually. Their first perceptions of OER were very basic (i.e., freely available resources from the Internet). However, by the end of the capacity-building exercise, the participants had improved their understanding about open licensing, open scholarship, open badges, OER-based learning and OER-based course design.

In a study in Sri Lanka, Karunanayaka (2012) found that OER has different meanings, including “resources that are freely accessible to be used by anyone,” “shared education resources” and “reusable digital materials” for teaching/learning/research and so forth. However, the majority (72.2%) of the respondents either had not heard of OER or had no prior experience in using them. A small percentage (27.8%) claimed awareness of certain OER initiatives — e.g., OCW, MERLOT and Jorum.

For teachers, the concept of OER is a two-way process, offering the benefits of reusing and of sharing. Some teachers conceptualise OER in terms of a pot from which they can simply pull out materials to use. Others view OER as “free materials on the Web” and have no knowledge of open licensing (Masterman & Wild, 2011). Teachers also lack knowledge of technology, copyright issues and intellectual property rights. Mtebe and Raisamo (2014a) found that 82% of teachers had shared course notes with other instructors, while 73% were aware of OER and 84.6% were willing to share their course notes freely on the Internet. Teachers in this study mainly lacked knowledge of copyright and intellectual property issues.

Venkaiah (2008) studied the attitudes and perceptions of distance teachers towards OER and found high levels of awareness, although the levels of involvement in OER activities were inadequate, as OER development and use in India are low compared to in developed countries.

It seems that although the significance of OER is rapidly increasing, lack of awareness and knowledge of how and where to search for OER hinder its proliferation and adaptation. In their study of teachers, Brent, Gibbs and Gruszczynska (2012) confirmed that copyright was not perceived as a significant issue in higher education, with 55% of the respondents indicating that they did not pay attention to licensing, because they were using the materials for educational purposes. A further group of 12% agreed that they did not consider it necessary to seek permission to use online materials. An OECD (2007) study indicated that although many teachers were willing to share, they were hesitant due to concerns over losing their copyright. Hence, raising awareness about copyright and intellectual property rights could facilitate the use and reuse of OER (Clements & Pawlowski, 2012).

#### **4.1.2 Sharing and Borrowing**

Teachers have been sharing projector transparencies and, later, PowerPoint presentations for quite some time, so sharing of educational resources is not a “new phenomenon” (Attwell & Pumilia, 2007). Resources shared by teachers are denoted as reusable learning objects (RLOs), open courseware (OCW), open content and/or OER. The OECD report *Giving Knowledge for Free* (2007) emphasised that OER present “a radically new approach to sharing, at a time when effective use of knowledge is seen more and more as the key to economic success, for both individuals and nations” (p. 9). There are various drivers of change, including technological, legal, social and economic, when it comes to individuals and institutions supporting the use, creation and sharing of OER (Geser, 2007; OECD, 2007). OER can help an

organisation to maintain records of the internal and external use of its resources. Hylén (2006) looked at the matter from an individual's standpoint and found that open sharing boosted the sharer's public profile, reputation and professional satisfaction.

A recent study on faculty incentives for sharing course material indicated that teachers would share more if they knew who would be using their work and knew that their copyright would be preserved and their content not altered (Kursun, Cagiltay, & Can, 2014). The last point indicates the importance of using, in some cases, non-derivative licences. It also shows that teachers are ready to share but neither fully convinced about the benefits of OER reuse nor confident about allowing others to use their work to create derivatives.

Several researchers have explored the possible determinants of sharing and borrowing behaviour as these relate to OER. Bates, Loddington, Manuel and Oppenheim (2007) and Rolfe (2012) examined the attitudes of university teachers about sharing and borrowing OER. They identified that teachers' concerns about sharing their teaching materials were based on beliefs about (i) open education, (ii) economic factors and (iii) how sharing could enhance the reputation of both the institution and the individual. New staff members were more concerned over copyright and were more positive about borrowing resources, due to the cost and time saved, whereas senior staff had difficulty adapting to the idea of OER and therefore preferred to work in isolation and use their own resources without borrowing from or sharing with others (Rolfe, 2012).

The results of the study by Rolfe (2012) also indicated that some staff shared and borrowed learning resources mostly with their close working colleagues, and that female staff members shared and borrowed more than male staff. Sharing within and outside a particular organisation has also been investigated. Reed (2012) found that 57% of the respondents in that study were willing to share their resources outside their organisation or university. However, they were divided into two main categories: sharing with any not-for-profit users (42%) and sharing with anybody (15%). Recently, Veletsianos (2015) reported on a study in a North American university that found faculty members often shared scholarly materials online for free, but they frequently did so without associated open licences (i.e., without engaging in open practices), which led the researchers to conclude that while individual factors may influence the decision to share, the institutional contexts and technology of sharing could help improve sharing behaviour. Davis et al. (2010) identified a few benefits of sharing resources within the university: using a virtual learning environment to share resources avoids duplication of efforts, and university senior officials can ensure the quality of courses, reward teachers and help identify gaps in curriculum areas. The study also identified three common services as benefits of sharing: hosting, organisation and community. Hosting sharing sites in a university allows non-technical users to put complex content online. Sharing within the organisation has been viewed as an opportunity to learn from senior colleagues and increase local language information on the Internet. Sharing also enables exposure to a larger community of users through the profile page of the contributor (Kursun et al., 2014).

Hilton and Wiley (2010) reported that authors believed all scholars have a professional responsibility to make their works as widely available, without price barriers, as is possible, and that authors wanted wider visibility of their work, which is possible through the Web and by making their work available through open licences. Sharing provided additional opportunities to reach new audience easily. The respondents reported in the study also believed in giving back to the community, which provided them with artistic and moral satisfaction. Schroter, Tite and Smith (2005) explored authors' attitudes towards open access publishing and their intentions to submit their work to different journals. The study indicated that the benefits of open access publishing include: easier and faster literature searching; reduced costs in terms of time savings, photocopying, interlibrary loans and subscriptions; faster dissemination of results to a wider audience; and more equitable access.

Karunanayaka (2012), in a study on the perception of teachers, principals and teacher educators regarding sharing, found that the majority of teachers had positive attitudes about sharing educational resources because doing so enhanced a good teacher's reputation and saved time and money. There were some negative responses, including that sharing and using required "re-working," which also indicates that some teachers are not ready to accept sharing if doing so means extra work. In the study by Venkaiah (2008) that reported positive attitudes towards OER in Indian universities, 89.52% of the respondent teachers opined that OER would save teachers time.

### **4.1.3 Adoption and Use of OER**

Factors associated with the adoption, use and reuse of OER also determine teachers' attitudes towards engaging in OER. Free availability and reusability, reduced cost, and ease of use and reuse are major reasons for teachers to adopt and use OER. In addition, teachers' technological competencies and ICT skills also influence their decisions to adopt and use OER.

Within the academic world, it is widely believed that "knowledge is for public good," to benefit all individuals according to their potential and capacity (Hussain, Chandio, Sindher, & Hussain, 2013). *Free availability and reusability* are therefore essential components of adopting and using OER. In a study by Hussain et al. (2013), 85.7% of respondents acknowledged that OER were freely available and therefore could be easily reused, according to their requirements. Kelly (2014) discussed two potential benefits of OER: (i) the development of competence in the creators of OER to design their materials to meet the perceived needs of educators, and (ii) the support of instructional communications by the inclusion of OER in lesson planning and curriculum development (Kelly, 2014). Chae's and Jenkins's (2015) findings indicated six major benefits, including cost savings for students, enhanced ability to respond to emerging instructional situations as they occurred, increased ability to foster and sustain collaboration, more diverse course content, and opportunities for increased reflection on teaching practices.

A recent study consisting of university students of Korea National Open University analysed adult learners' intentions to use OER and revealed that both perceived ease of use and job fit played important and positive roles in affecting the behavioural intention to use OER. Moreover, it was found that personal usefulness had no effect on intention to use. Hence, the majority of adult learners were found to prefer OER content that they found interesting and could easily understand, such as special lectures by experts or a key issue in a particular field, rather than content directly related to learning (Kim, Lee, Lee, & Shon, 2015).

*Cost reduction* is the most significant factor influencing whether faculty adopt OER. For many classes, textbooks have been and continue to be more expensive than tuition, thereby constituting a significant obstacle to access (Zaltman, Duncan, & Holbek, 1973). Another study found that cost and access factors influenced open learning (Hussain et al., 2013). The latter revealed that some OER, because they were digital, saved the users in travel cost, as the materials could be accessed from home or the workplace. In addition, significant cost reduction was also reported by avoiding photocopying materials and purchasing books and other instructional resources.

*Perceived quality of the content* contributes to faculty adoption of open resources. Perception of quality is derived from various sources, including pedagogical approaches, recommendations and peer review. Additionally, teachers' perception about quality of instruction and learning may contribute toward determining whether or not they contribute to OER (Black, 1992). Black also found that faculty who were not in favour of open learning and did not treat it as equivalent to traditional learning were not ready to adopt and use OER.

Teachers are usually apprehensive about the quality of OER and other materials available on the Internet, particularly because they are responsible for ensuring the quality of the chosen OER and how they integrate these resources into their teaching activities (Butcher, 2011; Dinevski, 2008). These researchers recommend that adoption and use of OER can begin once teachers have quality concepts explained to them.

*Ease of use* has emerged as an important influence upon faculty decisions to adopt and use OER. It is assumed that OER can eliminate the burden of carrying a heavy copy of a book, which can instead be available digitally. In addition, innovative digital resources can easily be assimilated into new course content (Osika, Johnson, & Buteau, 2009). Although the time and effort required for reusing and remixing resources are potential challenges, teachers in these studies preferred to adopt OER because they were accessible at a reduced cost.

Other previous studies also have examined the difference between the impact of traditional learning and open learning on attitudes to openness. Hoy and Jalovick (1979) reported on the attitudes and behaviours of elementary and middle school teachers, finding that positive teacher attitudes regarding adopting and using open learning resources enhanced open classroom practices.

Hodgkinson-Williams and Paskevicius (2012a) used Moore and Benbasat's extension of Rogers' (1995) Theory of Perceived Attributes. Moore and Benbasat (1991) included "ease of use" along with "image" and "voluntariness" to study the adoption of information technology innovation. Hodgkinson-Williams and Paskevicius (2012a) reported that students' adoption of OER is related to a number of interdependent practices, including: the ease of using technology to find alternative materials; a culture of sharing; institutional image; and platform visibility.

*Technological friendliness* is another factor in the decision to use OER. Tabata and Johnsrud (2008) applied diffusion of innovation theory to look at faculty members' participation in the use of technology and their attitudes towards the adoption of innovations in a public post-secondary system. A five-point rating scale covered four dimensions — technology use, attitude toward technology, attitude toward distance education and adoption of innovations — and revealed that when faculty had a positive perception of technology, they were more likely to use OER. Spotts and Bowman (1995) noted that as faculty become proficient with technology, their use of it increases. Mtebe and Raisamo (2014b) in their study in Tanzania reported a lack of ICT infrastructure as one of the challenges teachers faced in adopting and using OER. Similar findings were reported by Samzugui and Mwinymbegu (2013), who revealed that poor Internet connectivity was a reason for low adoption and use of OER. Lack of awareness about copyright issues has also been identified as an obstacle for OER implementation (Hoosen, 2012; Percy & Van Belle, 2012).

ICT competencies were found to be an important factor for teachers to develop positive attitudes about contributing to and using OER. Teachers who are skilled with and knowledgeable about one technology are more comfortable and ready to use a different technology (Kagima & Hausafus, 2001). In addition, certain ways of use may define weak or strong OER adoption and/or contribution. These relate to functions whereby teachers can search for materials, find content and make them available for their classes. For some teachers, strong adoption of OER relates to actively contributing to and/or modifying resources, and updating links as well as tagging materials on the Web (Kerres & Heinen, 2015). A recent study revealed that activities relating to the use of OER (accessing, redistributing, reusing) are far more frequent than activities relating to contributing to OER (revision, remixing, developing) (Hart et al., 2015). Notably, faculty felt strongly that they would only use the work of others if they were allowed to adapt the materials for their own purposes and context; on the other hand, 59.5% of respondents indicated that they only felt comfortable sharing their work if others required written permission to modify it (Hart et al., 2015).

Other studies also have explored the attitudes of staff to *reusing* existing content. When teaching staff were asked about their willingness to reuse content in the future, the majority of them were willing without being aware of rights clearance (Reed, 2012). A positive environment and appropriate openly licensed resources were found to be other factors encouraging reuse (Pegler, 2012).

A teacher's decision to use and adapt OER also depends on whether the *resource is trustworthy* or not in the context of level and appropriateness. The need to rewrite inaccurate resources deters some teachers from using OER (Richter, 2011). In addition to this effort expectancy factor, performance expectancy and social influence were also found to have a significant positive effect on teachers' intention to adopt and use OER (Mtebe & Raisamo, 2014a).

Lastly, *professional knowledge* plays a vital role in the use, reuse and adaptation of OER. In the process of preparing a lesson, teachers engage directly with OER and, if necessary, adapt them. Reflection upon professional practice after the lesson further engages them to refine and adapt OER by sharing their insights with others (Beaven, 2013).

Lack of awareness about OER is a major concern, as uninformed faculty members are not able to take full advantage of OER in their teaching. Those who are aware of OER are sometimes not entirely aware of their effective usage and face difficulties in understanding matters of authorship, licensing and pedagogical value. Some teachers find the sharing and borrowing of educational resources problematic. Other factors mitigating against the use and adoption of OER include concerns about their cost effectiveness, ease of use and quality. The absence of recognition, rewards and incentives is another problem, as are issues with training in innovative technology, and the availability and reliability of IT resources.

## 4.2 Teachers' Attitudes towards OER

Data on respondents' attitudes towards OER were gathered using the ATOER scale in the questionnaire. While the questionnaire contained more items in the scale, reporting on attitudes drew upon only the 17 items in the standardised scale (see Appendix 1).

The analyses of the overall means and range (Table 4.1) on the ATOER scale items indicated that respondents had positive attitudes towards OER ( $M = 4.31$ ,  $SD = .468$ ).

**Table 4.1:** Overall Analysis of ATOER Scale

Overall Analysis	Statistics
N	117
Items	17
Mean	4.31
Std. Error of Mean	.04
Std. Deviation	.46
Minimum	2.94
Maximum	5.00

Table 4.2 presents statistics related to the 13 items in the “sharing OER” sub-scale. The attitude scores ranged from 4.06 to 4.65, indicating that the respondents were positive about sharing OER. The item with highest mean score was about the pleasure that the respondents felt when someone adopted/adapted their educational resources (M = 4.65). Similarly, they accepted that sharing educational resources helped them gain feedback (M = 4.58) and therefore might also improve their professional respect (M = 4.54) by enhancing personal and institutional reputation as well (M = 4.50). The respondents also felt that sharing resources disseminated their ideas (M = 4.29) and enhanced their confidence. Sharing made them feel that they were an important part of a larger community (M = 4.46). Sharing OER also increased their network and sphere of influence (M = 4.42) and brought them recognition at the global level (M = 4.41). They also accepted that sharing OER promotes collaboration and consortia (M = 4.25). Respondents believed that sharing learning materials was part of their responsibility as teachers (M = 4.06). They also indicated that sharing helped them feel a sense of achievement when others used their work (M = 4.40), and they believed their sharing behaviour would encourage others to create and share resources as OER (M = 4.27).

**Table 4.2:** Average of ATOER Sub-scale Items on “Sharing of OER”

Sr. No.	The Item Statements (Sharing of OER)	Range	Minimum	Maximum	Mean		Std. Dev.
					Statistic	Std. Error	
1.	Sharing of educational resources improves my professional respect.	4	1	5	4.54	0.05	0.62
2.	It gives me pleasure if someone adopts/adapts my educational resources.	3	2	5	4.65	0.04	0.52
3.	Sharing helps me to get feedback.	2	3	5	4.58	0.05	0.60
4.	Sharing enhances my personal and organizational reputation.	3	2	5	4.5	0.06	0.66
5.	Sharing of educational resources increases my profile amongst peers and others.	3	2	5	4.33	0.07	0.8

*Contd...*



Sr. No.	The Item Statements (Sharing of OER)	Range	Minimum	Maximum	Mean		Std. Dev.
					Statistic	Std. Error	
6.	OER increase my network and sphere of influence.	4	1	5	4.42	0.07	0.78
7.	As a teacher, it is my responsibility to share all educational resources created by me.	4	1	5	4.06	0.08	0.97
8.	OER improve my chance of recognition at a global level.	4	1	5	4.41	0.06	0.74
9.	I believe that sharing educational materials as OER will encourage others to do so as well.	3	2	5	4.27	0.07	0.78
10.	Sharing enhances my confidence, as I see myself as part of a larger community.	3	2	5	4.46	0.05	0.58
11.	When others use my OER, it improves my sense of achievement.	3	2	5	4.4	0.06	0.73
12.	OER help to disseminate my ideas.	4	1	5	4.29	0.07	0.77
13.	OER promote collaboration and consortia.	3	2	5	4.25	0.06	0.72

The analysis of these teachers' attitudes towards the adaptation and use of OER (Table 4.3) shows that all the participating teachers had positive attitudes towards adapting and using OER, with means ranging from 3.72 to 4.19. Most of the respondents indicated that their competencies in and knowledge of OER would help them to participate or adopt OER ( $M = 4.19$ ). They also indicated that knowledge of intellectual property rights is important in understanding OER ( $M = 3.72$ ). As OER increasingly are digital in nature, they believed that ICT skills are important for adopting and using OER ( $M = 4.09$ ). They used OER when delivering courses to fulfil the academic requirements of their students ( $M = 4.12$ ).

**Table 4.3:** Average of ATOER Scale Items on “Adaptation and Use of OER”

Sr. No.	The Item Statement (Adaptation and Use of OER)	Range	Minimum	Maximum	Mean		Std. Dev.
					Statistic	Std. Error	
1.	I have knowledge of intellectual property rights to understand OER.	4	1	5	3.72	0.09	0.97
2.	I am efficient in information communication technology (ICT) skills to adopt and use OER.	3	2	5	4.09	0.07	0.85
3.	I adopt OER for my teaching as they fulfil academic requirement of my students.	3	2	5	4.12	0.07	0.85
4.	My own competencies and knowledge towards OER help me to participate or adopt OER.	3	2	5	4.19	0.07	0.76

**Table 4.4:** Distribution of ATOER with Weighted Score and Rank

Items of ATOER	Median	Mode	Strongly Disagree	Disagree	Un Decided	Agree	Strongly Agree	Weighted Score	Weighted Rank	Skewness	Kurtosis
1	5	5	0	0	3	34	80	545	1	-1.2	.44
2	5	5	0	2	1	40	74	537	2	-1.66	3.9
3	5	5	0	1	5	40	71	532	3	-1.27	1.58
4	5	5	0	2	5	42	68	527	4	-1.36	2.08
5	4	5	0	1	2	56	58	522	5	-.79	1.18
6	5	5	1	3	6	42	65	518	6	-1.69	3.66
7	5	5	0	3	9	42	63	516	7	-1.21	1.22
8	5	5	1	2	5	50	59	515	8	-1.59	4.15
9	4	5	1	4	7	48	57	507	9	-1.47	2.75
10	4	5	0	5	8	51	53	503	10	-1.13	1.23
11	4	5	0	3	15	46	53	500	11	-.85	.16
12	4	4	0	3	10	58	46	498	12	-.85	.85

*Contd...*

Items of ATOER	Median	Mode	Strongly Disagree	Disagree	Un Decided	Agree	Strongly Agree	Weighted Score	Weighted Rank	Skewness	Kurtosis
13	4	4	0	5	10	59	43	491	13	-.93	.95
14	4	4	0	8	12	54	43	483	14	-.92	.43
15	4	4	0	8	13	56	40	479	15	-.86	.37
16	4	4	2	8	15	47	45	476	16	-1.05	.76
17	4	4	2	16	16	61	22	436	17	-.76	.03

We also applied statistical tests to determine whether the distribution of attitude (weighted score) was the same across the sharing and adaptation sub-scales. Table 4.4 shows that respondents were more positive about sharing OER than about adaptation and use. In order to further confirm this difference, a Mann-Whitney U Test was performed to test the hypothesis that the distribution of items was the same across categories in the sample. The result is significant at the 0.05 level ( $p= 0.045$ ) which confirms that respondents agreed/strongly agreed about “sharing” more than about “adaptation” factors (Table 4.5). This is also evident by the lower ranks of adaptation items in Table 4.7. There was a marginal preference for sharing materials rather than using materials created by others, and this is an important finding. However, the kurtosis value of above 3 for some items in Table 4.4 shows that the data are not distributed normally for all the items. This allows us to use non-parametric tests to analyse our data.

**Table 4.5:** Hypothesis Test Summary

Null Hypothesis	Test	Sig.	Decision
The distribution of item is the same across categories of group.	Independent-Samples Mann-Whitney U Test	.045 <sup>1</sup>	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

<sup>1</sup>Exact significance is displayed for this test.

### 4.3 Differences in Attitudes towards OER

Overall, the attitudes of the respondents towards OER were positive. However, in order to find answers to the research questions about possible differences in attitude with various demographic variables, including gender, age, designation, discipline, highest qualification, teaching experience, nature of institutions, OER user and OER contributor, we conducted a set of tests, which are reported below. Interestingly, none of the tests show any significant relationships, and we suggest that the respondents’ attitudes towards OER were not significantly different across the demographic variables.

## Gender

Table 4.6 reveals the pattern of relationship between respondents' gender and their attitude towards OER. Of the males, 98.5% had a positive attitude towards OER, while 98% of the females did. The chi-square test revealed that  $\chi^2$  (2, N = 117) = 0.146,  $p > .05$ , so there was no difference in the attitude of male and female respondents toward OER.

**Table 4.6:** Gender and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
Gender	Male	Count	1	37	29	67
		% within Gender	1.5%	55.2%	43.3%	100.0%
		% within Median Attitude	50.0%	58.7%	55.8%	57.3%
	Female	Count	1	26	23	50
		% within Gender	2.0%	52.0%	46.0%	100.0%
		% within Median Attitude	50.0%	41.3%	44.2%	42.7%
Total	Count	2	63	52	117	
	% within Gender	1.7%	53.8%	44.4%	100.0%	
	% within Median Attitude	100.0%	100.0%	100.0%	100.0%	

Chi-square = .146, df = 2, N = 117,  $p = 0.93$ .

## Age

Table 4.7 shows that respondents in the age group under 35 were more positive towards OER than the others. Amongst the 13 teachers who were 50 years or older, 76.9% had a positive attitude. A two-tailed chi-square test revealed  $\chi^2$  (4, N = 117) = 7.322,  $p > 0.05$ , indicating that there is no significant evidence to conclude that there was a difference in attitude towards OER amongst different age groups.

**Table 4.7:** Age and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
Age	< 35 years	Count	2	34	24	60
		% within Age	3.3%	56.7%	40.0%	100.0%
	36–50 years	Count	0	19	25	44
		% within Age	0.0%	43.2%	56.8%	100.0%
	51+ years	Count	0	10	3	13
		% within Age	0.0%	76.9%	23.1%	100.0%
Total	Count	2	63	52	117	
	% within Age	1.7%	53.8%	44.4%	100.0%	

Chi-square = 7.322, df = 4, N = 117,  $p = 0.120$ .

## Discipline

Table 4.8 shows the pattern of attitude towards OER according to the discipline grouping of the respondents. Most of the teachers (59 out of 117) were from humanities and social sciences backgrounds, including education and law. Amongst these, 52.5% gave a strongly positive response to OER, while 45.8% gave a positive response. Among engineering and technology teachers, 76.9% indicated a positive attitude towards OER. The chi-square test revealed  $\chi^2 (8, N = 117) = 9.907, p > 0.05$ , indicating that any difference in attitude towards OER according to respondents' discipline was not statistically significant. Thus, for this sample, attitude towards OER was not related to any disciplinary knowledge.

**Table 4.8:** Discipline and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
Discipline	<b>Humanities and Social Sciences (including Education and Law)</b>	Count	1	27	31	59
		% within Discipline	1.7%	45.8%	52.5%	100.0%
	<b>Management and Commerce</b>	Count	0	5	6	11
		% within Discipline	0.0%	45.5%	54.5%	100.0%
	<b>Natural Sciences</b>	Count	0	10	10	20
		% within Discipline	0.0%	50.0%	50.0%	100.0%
	<b>Engineering and Technology</b>	Count	1	20	5	26
		% within Discipline	3.8%	76.9%	19.2%	100.0%
	<b>Medical and Health Sciences</b>	Count	0	1	0	1
		% within Discipline	0.0%	100.0%	0.0%	100.0%
	<b>Total</b>	Count	2	63	52	117
		%	1.7%	53.8%	44.4%	100%

Chi-square = 9.907, df = 8, N = 117, p = 0.272.

## Highest Qualification

The range of responses in terms of the respondents' qualification level are depicted in Table 4.9, which reveals that 56.8% of respondents with a bachelor's/master's degree and 51.6% with a PhD degree had a positive attitude towards OER. Furthermore, statistical testing shows that there is no significant difference between teachers' attitude towards OER and their qualification level ( $\chi^2 (4, N = 117) = 4.021, p > 0.05$ ).

**Table 4.9:** Higher Qualification and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
Highest Qualification of Teachers	<b>Bachelor and Master's Degrees</b>	Count	2	25	17	44
		% within Highest qualification	4.5%	56.8%	38.6%	100.0%
	<b>MPhil</b>	Count	0	5	4	9
		% within Highest Qualification	0.0%	55.6%	44.4%	100.0%
	<b>PhD</b>	Count	0	33	31	64
		% within Highest Qualification	0.0%	51.6%	48.4%	100.0%
	Total	Count	2	63	52	117
		%	1.7%	53.8%	44.4%	100.0%

Chi-square = 4.021, df = 4, N = 117, p = 0.403.

## Teaching Experience

Table 4.10 below shows the respondents' teaching experience and their attitudes towards OER. It reveals that 100% of the teachers with experience of 16–35 years had positive or strongly positive attitudes towards OER. Furthermore, the chi-square test revealed no difference in attitude towards OER amongst respondent groups with different years of teaching experiences ( $\chi^2$  (8, N = 117) = 3.609, p > 0.05).

**Table 4.10:** Teaching Experience and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
Teaching Experience	<b>0–5 years</b>	Count	1	20	12	33
		% within Teaching Experience	3.0%	60.6%	36.4%	100.0%
	<b>6–15 years</b>	Count	1	23	24	48
		% within Teaching Experience	2.1%	47.9%	50.0%	100.0%
	<b>16–25 years</b>	Count	0	12	12	24
		% within Teaching Experience	0.0%	50.0%	50.0%	100.0%

*Contd...*

		Attitude			
		Neutral	Positive	Highly Positive	Total
<b>26–35 years</b>	Count	0	7	3	10
	% within Teaching Experience	0.0%	70.0%	30.0%	100.0%
<b>More than 35 years</b>	Count	0	1	1	2
	% within Teaching Experience	0.0%	50.0%	50.0%	100.0%
<b>Total</b>	Count	2	63	52	117
	% within Teaching Experience	1.7%	53.8%	44.4%	100.0%

Chi-square = 3.609, df = 8, N = 117, p = 0.891.

### Nature of Institutions

The cross-tabulation shown in Table 4.11 reveals that 100% of respondents in face-to-face teaching institutions and dual-mode institutions had positive/highly positive attitudes towards OER, whereas 94.9% of respondents at distance education institutions had positive/highly positive attitudes. The chi-square test revealed no significant difference in attitudes towards OER according to the nature of institutions ( $\chi^2$  (4, N = 117) = 5.201, p > 0.05).

**Table 4.11:** Nature of Institution and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
<b>Nature of Institution</b>	<b>Face-to-face Teaching</b>	Count	0	33	25	58
		% within Nature of Institution	0.0%	56.9%	43.1%	100.0%
	<b>Distance Education</b>	Count	2	18	19	39
		% within Nature of Institution	5.1%	46.2%	48.7%	100.0%
	<b>Dual-mode Teaching</b>	Count	0	12	7	19
		% within Nature of Institution	0.0%	63.2%	36.8%	100.0%
<b>Total</b>	Count	2	63	51	116	
	%	1.7%	54.3%	44.0%	100.0%	

Chi-square = 5.201, df = 4, N = 116, p = 0.267.

## Use of OER

Among respondents who were users of OER, 98.8% had a positive attitude towards OER, compared with 97% of non-users (Table 4.12). Chi-square test results indicated that teachers' attitude towards OER was not significantly different between users and non-users ( $\chi^2 (2, N = 114) = 0.546, p > 0.05$ ).

**Table 4.12:** OER Use and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
<b>Previous OER Use</b>	<b>No</b>	Count	1	17	15	33
		% within Previous OER Use	3.0%	51.5%	45.5%	100.0%
		% within MEDIAN ATTITUDE	50.0%	27.0%	29.4%	28.4%
<b>Yes</b>		Count	1	46	36	83
		% within Previous OER Use	1.2%	55.4%	43.4%	100.0%
		% within MEDIAN ATTITUDE	50.0%	73.0%	70.6%	71.6%
<b>Total</b>		Count	2	63	51	116
		% within Previous OER Use	1.7%	54.3%	44.0%	100.0%
		% within MEDIAN ATTITUDE	100.0%	100.0%	100.0%	100.0%

Chi-square = 0.546, df = 2, N = 114, p = 0.761.

## Contribution to OER

All the teachers who contributed to OER had positive/highly positive attitudes towards OER. In comparison, 97.6% of those who had never contributed also had positive/highly positive attitudes (Table 4.13). The chi-square test revealed that attitude towards OER was not significantly different between contributors and non-contributors of OER ( $\chi^2 (2, N = 114) = 1.32, p > 0.05$ ).



**Table 4.13:** Contribution to OER and Attitude Cross-tabulation

		Attitude			Total	
		Neutral	Positive	Highly Positive		
<b>Previous OER Contribution</b>	<b>No</b>	Count	2	46	34	82
		% within Previous OER Contribution	2.4%	56.1%	41.5%	100.0%
	<b>Yes</b>	Count	0	16	16	32
		% within Previous OER Contribution	0.0%	50.0%	50.0%	100.0%
<b>Total</b>	Count	2	62	50	114	
	% within Previous OER Contribution	1.8%	54.4%	43.9%	100.0%	

Chi-square = 1.32, df = 2, N = 114, p = 0.517.

## 4.4 Discussions

Overall, higher education teachers of India as sampled in this study have positive attitudes towards OER. They prefer sharing their own educational materials rather than adapting materials prepared by others, and their attitudes towards OER are not significantly different across any of the demographic variables. Teachers in the study indicated that they would share educational materials for the pleasure of sharing (Hylén, 2006). They are also inclined to share to improve the reputation of their institutions as well as to build their professional image and reputation (Karunanayaka, 2012). The respondents in the study had positive attitudes and felt that sharing is an inherent responsibility of a teacher. However, we also found that their attitudes towards the adaptation of OER were not as strong as their sharing attitudes. This may be due to the fact that most of the respondents identified themselves as non-contributors to OER. An issue that emerged from the attitudes analysis is the importance of teachers understanding copyright and open licences, as has been observed in other studies (Hart et al., 2015; Pegler, 2012; Reed, 2012). We also see that the respondents' attitudes towards OER adaptation may be influenced by their ability to use ICT effectively (Kagima & Hausafus, 2001; Kerres & Heinen, 2015).

Qualitative data collected through the JAM sessions during the workshops also complemented the statistical results of the ATOER scale. We present here a sample of the statements made by the respondents during the workshops:

I will use freely accessible documents, material and multiple sources that are available related to my specialisation.

[OER are] useful for learning, teaching and research purposes in various ways to enrich my knowledge.

I am positive about OER because the poor community of people who don't have resources to afford engineering or other courses which are of high cost can be benefitted from OER.

A large number of respondents indicated OER are valuable due to their availability and free access. Others were also positive about OER due to its potential to enhance quality, save money and time, and improve sharing and collaboration. The following sample statements illustrate some of these attitudes:

[I]t will enable the faculty to do more research in their discipline and also in ODL... as they will have more time.

Education will become more competitive and hence quality will be enhanced, as now the resources will be easily accessible.

OER could be up-to-date... excellent in content and quality.

The discussions also revealed that respondents were more concerned about quality, and they often expressed concerns related to infrastructural barriers. OER as an idea and set of practices was highly accepted by this group of teachers. It is important to harness this positive attitude towards OER in order to promote the increased use and adaptation of OER in India.

# Motivations to Use and Contribute OER

## 5.1 Motivations to Use OER

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Studies on motivation examine why people think and behave as they do. People do certain things to satisfy their needs, which motivate them to behave in particular ways. Motivation can be intrinsic and/or extrinsic (Ryan & Deci, 2000). According to Ryan and Deci (2000), an intrinsically motivated person is moved to act for the fun or challenge entailed rather than because of external prods, pressures or rewards. In contrast, extrinsic motivation is a construct that pertains whenever an activity is done to attain some separable outcome, such as pay, promotion, feedback, better working conditions or other benefits.

An individual can be motivated or demotivated by different things. It is essential to reduce demotivators and inculcate motivating factors into a system to help people perform optimally. Rolfe (2012) has stated that “understanding the motivations and characteristics of potential users is important to develop strong and sustainable strategies and practices” (p. 10) for OER.

Social exchange theory (SET), a derivative of SLT, suggests that behaviours are also motivated by costs and benefits — in other words, perceived usefulness. Satisfaction is an intrinsic cost and benefits motivation, while financial gains or grades are extrinsic. Hung, Durcikova, Lai and Lin (2011) found that the primary extrinsic motivator behind knowledge sharing was based not only on financial benefit but also on social reputation. Similarly, a study by Kankanhalli, Tan and Wei (2005) found that self-efficacy and enjoyment derived from helping others were key intrinsic motivators for knowledge contribution to electronic repositories. The motivation to help others irrespective of potential costs or lack of extrinsic gains can be described as altruistic.

Research has shown that sharing behaviour can arise from several motives, some of which are related to revenue, prestige or reputation, self-efficacy and self-confidence. Cabrera, Collins and Salgado (2006) found that teachers are more inclined to share when they consider themselves adequately skilled and believe they will be adding value through their work. In addition, reputation, altruism and reciprocity are factors prompting teachers to share. Reputation refers to the institutional, national

or international recognition that teachers get by sharing their materials as OER. Wang and Noe (2010) called this “impression management” and noted that sharing can effectively build one’s reputation as a sharing person. In the field of online communities, Tiwana and Bush (2001) and Hemetsberger (2002) found “reputation points” to be an incentive for sharing knowledge. An OECD (2007) report also identified that some faculty may try to impress their colleagues by exhibiting their competencies, thereby gaining a higher reputation or “egoboo” within the open community.

Altruism is another intrinsic motivating factor, as the teacher experiences happiness by sharing without any desire for an external reward. There is personal satisfaction in knowing that one’s materials are available and used all over the world, and it is a pleasure to develop things together with peers and share with others (OECD, 2007). Conversely, the OECD findings also suggested that practical considerations were more important for teachers than altruistic concerns — for example, assisting developing countries, providing outreach to disadvantaged communities or reducing costs for students (OCED, 2007). Reciprocity entails that once a teacher shares content as OER, others will follow suit, so the teacher feels they are setting an example. This builds trust, which is crucial to co-operation and knowledge sharing (Chiu, Hsu, & Wang, 2006; Dirks & Ferrin, 2001; Jones & George, 1998; Mayer, Davis, & Schoorman, 1995).

Some researchers have examined the functional roles of trust in OER. Trust is a widely acclaimed, desirable attribute for teamwork and efficiency in communicating OER. There are five domains of trust in OER: cognitive, affective, metacognitive, environment and management (Kawachi, 2014a). Observers have emphasised that content should be reliable (cognitive) and presented in a user-friendly, conversational style (affective), that end-users should recommend the OER to others (metacognitive), that a copyright licence should be attached (environment) and that appropriate publicity is required (management).

Self-directed learning (SDL) has been found to be a major reason for teachers to use MIT’s OpenCourseWare, to “improve” or “enhance personal knowledge” or to “explore” areas outside one’s professional field (MIT, 2005). This learning approach increases teachers’ motivation to learn, since they experience a sense of independence while sharing. This process keeps them engaged, and they apply it along with their skills to further develop their knowledge and engage in lifelong learning (Saxena, 2013).

Saxena (2013) further identified various kinds of SDL modes that enable teachers to share through personal learning networks, using blogs and/or social networking platforms such as Twitter, Facebook and the like. Self-assessment and self-publishing are also used by teachers to share their ideas and work with real audiences. OER represented in the OpenLearn<sup>7</sup> platform incorporate material containing tasks that help with SDL and are offered through online learning environments (McAndrew, 2011).

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<sup>7</sup> <http://www.open.edu/openlearn/>

Jacobi, Jelgerhuis and Woert (2013) in trend reports also underlined that sharing OER brings the potential for flexibility and SDL amongst academicians, giving them the freedom to choose what they want to learn and how they want to learn it. Personal development and employability are important motives for engaging in open education. Hussain et al. (2013) found adults using OER wanted to augment their learning by blending new information with their (social) life experience.

Hussain et al. (2013) further found that the use of OER promotes self-directedness, and that users become self-regulated, self-confident and self-motivated. Improving readability, communication skills, understanding and comprehension through the use of OER are further benefits. In India, SDL has been highlighted in the context of lifelong learning. Several initiatives in India, such as eGyanKosh<sup>8</sup> at IGNOU and the Teachers of India Portal<sup>9</sup> at the Azim Premji Foundation, grant access to online learning resources with a diverse range of content to suit different segments of education, including lifelong learning (Das, 2011). OER promote SDL and thus facilitate identity construction among users (Tuomi, 2013).

Teachers' engagement with OER also enhances their pedagogical skills when they share. Being involved in OER training programmes, where they share and learn from others, may induce innovation and reduce isolation. OER helps teachers adopt new curricula and engage in professional development, and it enhances their recognition and sense of responsibility (Petrides, Jimes, Middleton-Detzner, & Howell, 2010).

Windle, Wharrad, McCormick, Lavery and Taylor (2010) shared their experiences of open sharing of reusable learning objects (RLOs) in the health sciences. They reported that a "sense of belonging, shared purpose, empowerment and activity, are the greatest drivers for participation in sharing of resources" (p. 7). This study also explored three issues deemed important for OER: sense of achievability, sense of ownership and sense of support. OER empower teachers to achieve their goals by sharing knowledge and can become part of their professional identity (Wild, 2012).

Further, involving others has been identified as a benefit in sharing resources. "Sharing is the ability to engage a much wider range of stakeholders in educational resource development, and thus to bring whole new areas of experience, perspective and knowledge into the educational arena" (Windle et al., 2010, p. 7). In another study, Seonghee and Boryung (2008) found that sharing behaviour is related to individual perceptions and to the reward system associated with sharing.

### **5.1.1 Intrinsic Motivators**

According to Ryan and Deci (2000), intrinsic motivation is defined as the doing of an activity for its inherent satisfactions and pleasures, rather than for some external consequence. Altruism, as the internal satisfaction or joy derived from an activity, is a

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<sup>8</sup> <http://egyankosh.ac.in/>

<sup>9</sup> <http://www.teachersofindia.org/en>

major aspect of intrinsic motivation in the use of OER. From this perspective, some people are involved with OER simply to do some good (Browne, Holding, Howell, & Rodway-Dyer, 2010; Clements & Pawlowski, 2012; Gaskell, 2011; Pegler, 2012), or to contribute to society (Clements & Pawlowski, 2012; Tromp & Long, 2013), or for the pleasure of being involved in peer production, or to stimulate innovation, or to share with others for creative, educational, scientific or research purposes (D'Antoni & Savage, 2009). The joy of being involved with OER may be the satisfaction derived from helping bring education to disadvantaged communities (Hylén, 2006) and non-traditional learners, and assisting developing countries (Hylén, 2006), without expecting anything in return. Some faculty members and institutions are motivated to use OER to increase their reputation (D'Antoni & Savage, 2009; Hall & Keynes, 2011; Rolfe, 2012) at both individual and institutional levels. Veletsianos's (2015) findings suggested that individual motivators are significant drivers of openness in the higher education context; the faculty members of North American universities in that study created and used/reused OER in the form of courses, workshops, training materials, assignments, activities and syllabi, often sharing them on social media sites.

Some people have an innate willingness to share (OECD, 2007) and are more comfortable (Beaven, 2013) with sharing than others, resulting in them sharing their teaching and learning materials, which may then be institutionalised as OER. This group of people believe it is a basic academic value to share knowledge (Browne et al., 2010; Gaskell, 2011; Hilton & Wiley, 2010; Pegler, 2012). Such activities improve the quality of educational resources (Browne et al., 2010; Harishankar, 2012; Hilton & Wiley, 2010) and instruction (Tabata & Johnsrud, 2008). OER are also preferred by some teachers because they create various opportunities to learn (Coughlan, Pitt, & McAndrew, 2013) by providing increased exposure (Hilton & Wiley, 2010), enhancing capacities to learn, advancing teaching–learning practices (Caswell, Henson, Jensen, & Wiley, 2008), empowering people with quality materials and disseminating knowledge (Kelly, 2014). Some people experience OEP as a potential networking environment and treat them as a source of knowledge and potential learning ties (Schreurs et al., 2014).

OER practitioners believe that there is little value in keeping educational resources closed, as open resources can actualise the real essence of teaching and learning. OER also provide practitioners with opportunities to experiment with new technologies and innovations (Hall & Keynes, 2011) and increase their opportunities to reach the educationally underserved (Caswell et al., 2008). The effectiveness of teaching and learning using OER is a motivator, as they save time (Butcher & Hoosen, 2012), money (Rolfe, 2012) and energy (Smith, 2013) — for teachers and for students. OER also give faculty members greater control over their own learning, in their own time and at their own pace (Butcher & Hoosen, 2012), and OER promote education and research as public activities (Harishankar, 2012). Access to the best material (Harishankar, 2012; Hylén, 2006), created through collaboration amongst colleagues and students, is also an inspirational factor in the use and promotion of OER. Involvement with OER enhances the practitioners' personal knowledge (Browne et al., 2010; Hylén, 2006), helps create social knowledge (Gaskell, 2011),

keeps information current (Caswell et al., 2008; Dhanarajan & Porter, 2013) and facilitates individuals' plans for future study (Hylén, 2006). OER open up new opportunities for collaboration and the co-construction of knowledge beyond institutional boundaries (Schreurs et al., 2014), which can motivate teachers to create and share OER.

### **5.1.2 Extrinsic Motivation**

Most people's activities are not always intrinsically motivated. Extrinsic motivation refers to a stimulus that directs an activity done to accomplish some separable external objective. "Unlike some perspectives that view extrinsically motivated behaviour as invariably non-autonomous, Self Determination Theory proposes that extrinsic motivation can vary greatly in the degree to which it is autonomous" (Ryan & Deci, 2000).

Some of the prime external motivators are institutional/organisational incentives (Yuan, MacNeill, & Krann, 2008). These can be in the form of appraisal scores (Harishankar, 2012; Olcott, 2012), monetary benefits, promotion and so on. In a recent study (Prasad & Usagawa, 2014), teachers identified their motivators for using OER as: finding something that would meet their instructional needs; achieving independence from a content provider; gaining credit towards promotion; obtaining current materials; furthering their professional development; receiving peer recognition; and gaining prestige/status.

Peer recognition (Harishankar, 2012; Hars & Ou, 2002; Reed, 2012; Rolfe, 2012; Terrasse, Marinova, Greller, & Schwertel, 2012) and publicity (D'Antoni, & Savage, 2009) are further motivations for using OER. The scope of peers in OER is not restricted to one's own institution but instead spans the whole world; peers can form a virtual group over the Internet to share and discuss OER content. This enhances the reputation of the contributor (D'Antoni & Savage, 2009) and of the parent institution, potentially bringing global recognition and esteem to both. In the parent institution, such an individual is considered an ambassador of OER (Harishankar, 2012) and a resource person to consult for guidance.

Due to the inherent factor of receiving recognition in a group, socially interactive situations such as joint approaches (Reed, 2012), collaborations among experts (Coughlan et al., 2013; Davis et al., 2010; Hall & Keynes, 2011; Harishankar, 2012; Terrasse et al., 2012), learning from each other (Coughlan et al., 2013) and social learning (Beaven, 2009) themselves become motivating factors for the uptake and use of OER.

These socially interactive and collaborative situations also provide opportunities for sharing solutions and strategies (Coughlan et al., 2013), disseminating research and scholarship (Prior, 2011), fostering new partnerships (Hall & Keynes, 2011), gaining additional recognition (Glennie, Harley, Butcher, & Wyk, 2012), establishing scaffolding for inexperienced faculty to design their courses (Kursun et al., 2014) and engaging in professional development (Jacobi et al., 2013) amongst people and

institutions. This sharing of expertise and knowledge satisfies the desire for “egoboo” (D’Antoni & Savage, 2009), which is an external motivational factor. Well-established and functional IT services (OECD, 2007), including Internet bandwidth (Davis et al., 2010; Mtebe & Raisamo, 2014a), enhance awareness and ease of sharing.

Factors related to the quality of OER content that enhance teachers’ motivation to use OER include: authenticity and accuracy of sources (Hussain et al., 2013), currency of content (Terrasse et al., 2012), contributions to universities where educational resources are scarce, support for lifelong learning (Kursun et al., 2014) and relevance of the knowledge for producing desired behavioural outcomes (Terrasse et al., 2012).

The ability to provide quality material (Clements & Pawlowski, 2012; Coughlan et al., 2013; Harishankar, 2012; Hilton & Wiley, 2010; Mtebe & Raisamo, 2014a; Terrasse et al., 2012) at very little or virtually no cost (Coughlan et al., 2013; Hylén, 2006; Kelly, 2014; OECD, 2007; Pegler, 2012; Prasad & Usagawa, 2014) is another motivation. The broad adoption of OER could lead to free textbooks for students, with a total annual savings in the United States alone of approximately one billion dollars (Hilton, Robinson, Wiley, & Ackerman, 2014); such a prospect may motivate some faculty to produce and share OER for philanthropic reasons. According to a recent study by Chae and Jenkins (2015), faculty members’ most important motivations for using OER are cost minimization, ease of availability and pedagogical freedom in their teaching practice.

Involvement in OER makes a person visible throughout the world, which acts as an advertisement (Harishankar, 2012) and increases the visibility of that individual as well as their institution (Glennie et al., 2012; Terrasse et al., 2012). Moreover, it helps faculty archive their own course materials (Kursun et al., 2014).

OER platforms are also a showcase (Pegler, 2012) for academics to present the world with a glimpse of their best work, thereby enhancing their reputation (Browne et al., 2010; Hall & Keynes, 2011; Hars & Ou, 2002; Rolfe, 2012), professional image (Das, 2011) and profile. Universities and institutions can leverage such initiatives to influence students’ selection of institutions (Caswell et al., 2008) and boost their recruitment of the best students (Hall & Keynes, 2011).

Sharing a book via an open licence increases the book’s exposure and reach (Hilton & Wiley, 2010); the same goes for teaching material, which may sometimes be used as pre-commercial publication publicity (D’Antoni & Savage, 2009). Releasing materials as OER also facilitates their reproduction (OECD, 2007), fostering the on-demand publishing of books. The beta version of such material is usually open for feedback, comments and ratings from colleagues (Terrasse et al., 2012), experts and students. Their suggestions and amendments can be incorporated in the final version of the material, thus enriching the end-users’ learning experiences (Caswell et al., 2008).

Creative Commons licensing facilitates the use and sharing of materials (OECD, 2007), with various combinations of licensing conditions fostering the reuse, revision,



remixing and redistribution of OER materials. The availability of OER in various formats, as well as ease of conversion from one format to another, further encourages the use of OER (Terrasse et al., 2012).

This wide range of internal and external motivations combine to create a situation that is conducive to the uptake of OER. Such motivators need to be put in place and stimulated in order to encourage the adoption of OER by individuals and institutions.

Studies of teachers' motivations for using and adopting OER in their teaching-learning processes have revealed a long list of intrinsic and extrinsic motivations that encourage teachers to apply OER in their educational processes. Some of them are altruistic, including: the positive benefits of OER in practice, the academic value of sharing and disseminating knowledge, the creation of learning opportunities, the effective utilisation of available time, the benefits of anywhere-anytime access, the updating of current knowledge in a given field, the provision of opportunities for collaboration and the co-construction of knowledge.

## 5.2 Teachers' Motivation Regarding OER

We studied the motivations of higher education teachers to use and adapt OER, in order to identify enabling factors that will encourage the use, reuse, creation, sharing or adaptation of OER. Mean, standard deviations and ranges were calculated on 19 OER motivation-related, Likert-type items. The analyses of the overall mean for the motivation items, as shown in Table 5.1, indicates that teachers' responses were inclined towards agreement with all the items related to motivation regarding OER ( $M = 3.97$ ,  $SD = 1.166$ ).

**Table 5.1:** Overall Analysis of Motivation

Overall Analysis	Statistics
N	117
Items	19
Mean	3.97
Std. Error of Mean	0.1
Std. Deviation	1.16
Minimum	1.00
Maximum	5.00

Table 5.2 displays the 19 items in the Likert scale to assess the respondents' motivation to use and adapt OER. While motivation can be categorised as intrinsic or extrinsic, the list of motivator statements largely included intrinsic statements, with only a few individual benefits that are extrinsic in nature. We used a different categorisation for analysis, as that gave us more scope to identify what the respondents believed to be their motivations to use and adapt OER. The most important category of factors were social and altruistic. The respondents believed that sharing knowledge ( $M = 4.70$ ), increasing access to education ( $M = 4.55$ ), improving students' learning ( $M = 4.53$ ),

Table 5.2: Motivation to Use and Adapt OER

Statements (Motivation to Use and Adapt OER)	Range	Min.	Max.	Mean		Std. Dev.
				Statistic	Std. Error	
<b>Social/Altruistic</b>						
Sharing knowledge is a basic academic value.	2.00	3.00	5.00	4.70	0.04	0.49
OER will help developing countries increase access to education.	3.00	2.00	5.00	4.55	0.06	0.64
I believe that OER are “good” for people, as OER improve their learning.	2.00	3.00	5.00	4.53	0.05	0.56
I try to contribute to OER to give back to society.	3.00	2.00	5.00	4.25	0.06	0.67
Through OER, I can reach disadvantaged communities.	4.00	1.00	5.00	4.09	0.09	0.99
<b>Learning</b>						
OER give me opportunities to learn new things.	3.00	2.00	5.00	4.51	0.06	0.65
OER cater to the innate desire to learn, improve and progress.	3.00	2.00	5.00	4.48	0.05	0.63
I like receiving comments and feedback from experts and senior colleagues on OER I have created.	3.00	2.00	5.00	4.46	0.06	0.71
<b>Access, Cost and Time</b>						
OER provide access to the best materials and teachers.	4.00	1.00	5.00	3.90	0.08	0.88
OER are less expensive.	4.00	1.00	5.00	4.40	0.06	0.72
OER save my time.	3.00	2.00	5.00	4.27	0.075	0.80
<b>Collaboration</b>						
OER provide us with opportunities to establish new partnerships.	3.00	2.00	5.00	4.25	0.06	0.74
I like to be involved in peer production of OER.	3.00	2.00	5.00	4.22	0.06	0.70
<b>Individual Benefits</b>						
OER improve professional image.	3.00	2.00	5.00	4.18	0.06	0.69
OER increase my self-confidence.	3.00	2.00	5.00	4.11	0.06	0.72

*Contd...*

Statements (Motivation to Use and Adapt OER)	Range	Min.	Max.	Mean		Std. Dev.
				Statistic	Std. Error	
Involvement in OER will bring me recognition.	3.00	2.00	5.00	4.05	0.07	0.85
Receiving appropriate credit will help me uptake OER.	4.00	1.00	5.00	3.95	0.09	1.04
<b>OER Technology and Knowledge</b>						
I know about my intellectual property rights under Creative Commons licences.	4.00	1.00	5.00	3.98	0.07	0.83
Technology associated with OER is easy.	3.00	2.00	5.00	4.10	0.07	0.78

giving back to society ( $M = 4.25$ ) and reaching disadvantaged communities ( $M = 4.09$ ) were reasons for using and adapting OER. The next category of factors is about learning, which is largely intrinsic in nature. Most of the respondents believed that OER give them opportunities to learn new things ( $M = 4.51$ ) and cater to their innate desire to learn, improve and progress ( $M = 4.48$ ), and they liked receiving comments and feedback from experts and senior colleagues regarding their work with OER ( $M = 4.46$ ). Access, costs and time (ACT) were also strong motivators. Saving time and reducing or eliminating cost were important motivators, while providing access to the best resources and teachers by using OER was another motivation. They also believed that OER provides opportunities to collaborate and produce materials with peers, which was a motivator for many. Knowing about Creative Commons licensing was another motivating factor—which makes sense, because if someone does not know about these licences, he/she will not use them. Knowledge of licensing encourages teachers to find relevant open materials. Respondents also believed that the technologies available to create OER are straightforward, which is encouraging. The individual benefits that can be categorised as extrinsic are related to recognition ( $M = 4.05$ ), credit ( $M = 3.95$ ), image building ( $M = 4.18$ ) and confidence development ( $M = 4.11$ ). This is important, as respondents believed that receiving credit for OER work in the same way they do for research papers would encourage them to engage in more OER work. They also believed that being recognised for OER work as well as building one's reputation and image are motivations for using and adapting OER.

Analysis of the motivation items in terms of weighted score and rank (Table 5.3) indicates that the items related to extrinsic factors were not the highest ranked, although some of them—such as credit, recognition and professional image—do have a score nearing 4 in the scale, as we see in Table 5.2. This is also an indicator that teachers' use of OER is largely influenced and motivated by intrinsic values. However, giving external motivation in terms of credit equivalent to what is granted for research papers, or recognition to boost their professional image, would help with their uptake of OER.

**Table 5.3:** Distribution of Motivation with Weighted Score and Rank

Motivation Statements	Median	Mode	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Weighted Score	Weighted Rank
Sharing knowledge is a basic academic value.	5	5	0	0	2	30	85	551	1
OER will help developing countries increase access to education.	5	5	0	2	4	38	73	533	2
I believe that OER are “good” for people, as they improves their learning.	5	5	0	0	4	46	67	531	3
OER give me opportunities to learn new things.	5	5	0	2	4	43	68	528	4
OER cater to the innate desire to learn, improve and progress.	5	5	0	1	6	45	65	525	5
I like receiving comments and feedback from experts and seniors on OER I have created.	5	5	0	3	6	42	66	522	6
OER are less expensive.	5	5	1	1	7	48	59	511	7
I try to contribute to OER to give back to society.	4	4	0	1	12	60	44	498	8
OER provide us with opportunities for establishing new partnerships.	4	4	0	4	9	57	47	498	9
OER save my time.	4	5	0	5	11	46	53	492	10
I like to be involved in peer production of OER.	4	4	0	1	15	56	43	486	11
OER improve my professional image.	4	4	0	3	10	66	37	485	12
OER increase my self-confidence.	4	4	0	3	15	63	35	478	13
Involvement in OER will give me recognition.	4	4	0	9	12	59	37	475	14
Technology associated with OER is easy.	4	4	0	4	18	55	38	472	15
Through OER, I can reach disadvantaged communities.	4	5	2	8	15	42	48	471	16
I know about my intellectual property rights under Creative Commons licences.	4	4	1	6	17	62	30	462	17
Receiving appropriate credit will help me take up OER.	4	5	2	12	18	41	43	459	18
OER provide access to the best materials and teachers.	4	4	1	5	30	48	32	453	19

### 5.3 Differences in Motivation to Use and Adapt OER

In order to understand differences in motivation for using and adapting OER, we conducted a series of chi-square tests for gender, age, designation, subject discipline, highest qualification, teaching experience, nature of institution, OER user and OER contributor. Largely, the results show that there was significant difference in motivation amongst age groups and highest qualification levels, whereas the other variables had no bearing.

#### Gender

Table 5.4 indicates that 97% of the male respondents either agreed or strongly agreed with the statements, while 92% of the female respondents had similar views. The chi-square test revealed ( $\chi^2 (2, N = 117) = 1.53, p >.05$ ) no relationship between gender and motivation factors.

**Table 5.4:** Gender and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Gender	Male	Count	2	41	24	67
		% within Gender	3.0%	61.2%	35.8%	100.0%
	Female	Count	4	28	18	50
		% within Gender	8.0%	56.0%	36.0%	100.0%
Total	Count	6	69	42	117	
	%	5.1%	59.0%	35.9%	100.0%	

Chi-square = 1.535, df = 2, N = 117, p = 0.464.

#### Age

Respondents' age distribution in terms of their motivation to use and adapt OER is shown in Table 5.5, which indicates that 93% of respondents in the age group of <35 years either agreed or strongly agreed with the statements in aggregate. Amongst respondents aged 51 years and above, 100% either agreed or strongly agreed, while more than half of the respondents (56.8%) in the middle age group (35–50 years) strongly agreed with the motivation statements in the questionnaire. The statistics here are interesting — most of the respondents identified and expressed their views of the items on the Likert scale as either agree or strongly agree. Teachers in the age group of 51 and above showed 100%, but the strongly agree in that group was only about 15%. The chi-square test revealed ( $\chi^2 (4, N = 117) = 15.273, p < 0.05$ ) that there was significant difference in motivation to use and adapt OER amongst the different age groups.

**Table 5.5:** Age and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Age	<b>&lt; 35 years</b>	Count	4	41	15	60
		% within Age	6.7%	68.3%	25.0%	100.0%
	<b>36-50 years</b>	Count	2	17	25	44
		% within Age	4.5%	38.6%	56.8%	100.0%
	<b>51+ years</b>	Count	0	11	2	13
		% within Age	0.0%	84.6%	15.4%	100.0%
Total	Count	6	69	42	117	
	% within Age	5.1%	59.0%	35.9%	100%	

Chi-square = 15.273, df = 4, N = 117, p = 0.004.

## Professional Designation

Table 5.6 shows respondents' professional designation in relation to their use and adaptation of OER. This also presents their level/position in the universities covered in the study. The "others" in the table also included academic staff supporting the

**Table 5.6:** Designation and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Designation	<b>Assistant Professor</b>	Count	3	44	24	71
		% within Designation	4.2%	62.0%	33.8%	100.0%
	<b>Associate Professor</b>	Count	2	8	7	17
		% within Designation	11.8%	47.1%	41.2%	100.0%
	<b>Professor</b>	Count	0	5	2	7
		% within Designation	0.0%	71.4%	28.6%	100.0%
	<b>Others</b>	Count	1	12	9	22
		% within Designation	4.5%	54.5%	40.9%	100.0%
	Total	Count	6	69	42	117
		%	5.1%	59.0%	35.9%	100.0%

Chi-square = 3.198, df = 6, N = 117, p = 0.784.

teaching and learning activities in the institutions covered. The respondents were largely at the level of assistant professor. Among assistant professors, 62% and 33.8% expressed agreement and strong agreement, respectively, regarding their motivation to use and adapt OER. There were only seven professors in the sample, most of

whom agreed with the motivation statements. Conversely, 47.1% of the associate professors agreed and 41.2% strongly agreed. The chi-square test revealed ( $\chi^2$  (6, N = 117) = 3.19,  $p > .05$ ) no significant correlation between respondents' academic level and their motivation with respect to OER.

## Discipline

Most of the teachers in the present study were from the humanities and social sciences (including education and law); almost half of these (49.2%) agreed with the motivation statements, and 44.1% strongly agreed (Table 5.7). The majority of teachers (76.9%) in the engineering and technology fields also agreed with the motivation statements. The chi-square test revealed ( $\chi^2$  (8, N = 117) = 10.54,  $p > .05$ ) no significant difference in motivation according to disciplinary orientation.

**Table 5.7:** Discipline and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Discipline	<b>Humanities and Social Sciences (including Education and Law)</b>	Count	4	29	26	59
		% within Discipline	6.8%	49.2%	44.1%	100.0%
	<b>Management and Commerce</b>	Count	0	6	5	11
		% within Discipline	0.0%	54.5%	45.5%	100.0%
	<b>Natural Sciences</b>	Count	0	13	7	20
		% within Discipline	0.0%	65.0%	35.0%	100.0%
	<b>Engineering and Technology</b>	Count	2	20	4	26
		% within Discipline	7.7%	76.9%	15.4%	100.0%
	<b>Medical and Health Sciences</b>	Count	0	1	0	1
		% within Discipline	0.0%	100.0%	0.0%	100.0%
	<b>Total</b>	Count	6	69	42	117
		%	5.1%	59.0%	35.9%	100.0%

Chi-square = 10.549, df = 8, N = 117,  $p = 0.229$ .

## Highest Qualification

Table 5.8 show that most of the respondents in the present study had a PhD; 51.6% of these agreed and 46.9% strongly agreed with the statements regarding motivations for using and adapting OER. By comparison, 91% of respondents with bachelor's

and/or master's degrees either agreed or strongly agreed. The chi-square test revealed ( $\chi^2$  (4, N = 117) = 10.2,  $p < .05$ ) a significant correlation between respondents' motivation towards using and adapting OER and their highest qualification.

**Table 5.8:** Teachers' Highest Qualification and Motivation Cross-tabulation

		Motivation			Total	
		Neutral	Positive	Highly Positive		
Highest Qualification	Bachelor and Master's Degrees	Count	4	29	11	44
		% within Highest Qualification	9.1%	65.9%	25.0%	100.0%
	MPhil	Count	1	7	1	9
		% within Highest Qualification	11.1%	77.8%	11.1%	100.0%
	PhD	Count	1	33	30	64
		% within Highest Qualification	1.6%	51.6%	46.9%	100.0%
Total	Count	6	69	42	117	
	%	5.1%	59.0%	35.9%	100.0%	

Chi-square = 10.201, df = 4, N = 117,  $p = 0.037$ .

## Teaching Experience

Table 5.9 shows the distribution of responses in terms of years of teaching experience and motivation towards OER. Of the respondents with teaching experience of six to 15 years, 58.3% agreed with the motivation statements, while 39.6% strongly agreed. Overall, the majority of respondents agreed. The chi-square test revealed ( $\chi^2$  (8, N = 117) = 9.64,  $p > .05$ ) no significant difference in the motivation of respondent groups with different lengths of teaching experience.

## Type of Institution

The data in Table 5.10 reveal that 60.3% of teachers from face-to-face teaching institutions in the study agreed with the motivation statements, compared with 61.5% from distance teaching institutions; 52.6% from dual-mode institutions agreed and 42.1% strongly agreed. For the most part, respondents across the institutions agreed, and the chi-square test revealed ( $\chi^2$  (4, N = 116) = 1.48,  $p > .05$ ) no difference in motivation across the institutions.



**Table 5.9:** Teaching Experience and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Teaching Experience	0–5 years	Count	4	22	7	33
		% within Teaching Experience	12.1%	66.7%	21.2%	100.0%
	6–15 years	Count	1	28	19	48
		% within Teaching Experience	2.1%	58.3%	39.6%	100.0%
	16–25 years	Count	1	11	12	24
		% within Teaching Experience	4.2%	45.8%	50.0%	100.0%
	26–35 years	Count	0	7	3	10
		% within Teaching Experience	0.0%	70.0%	30.0%	100.0%
	More than 35 years	Count	0	1	1	2
		% within Teaching Experience	0.0%	50.0%	50.0%	100.0%
Total	Count	6	69	42	117	
	%	5.1%	59.0%	35.9%	100.0%	

Chi-square = 9.645, df = 8, N = 117, p = 0.291.

**Table 5.10:** Nature of Institutions and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Nature of Institution	Face-to-face Teaching	Count	2	35	21	58
		% within Nature of Institution	3.4%	60.3%	36.2%	100.0%
	Distance Education	Count	3	24	12	39
		% within Nature of Institution	7.7%	61.5%	30.8%	100.0%
	Dual-mode teaching	Count	1	10	8	19
		% within Nature of Institution	5.3%	52.6%	42.1%	100.0%
Total	Count	6	69	41	116	
	%	5.2%	59.5%	35.3%	100.0%	

Chi-square = 1.486, df = 4, N = 116, p = 0.829.

## User and Non-users of OER

Table 5.11 shows that the majority of the respondents had previously used OER. Amongst these users, 59% agreed with the statements related to motivation towards OER, while 37.3% of them strongly agreed. Amongst those who had never used OER, 60.6% agreed and 30.3% strongly agreed. The chi-square test revealed ( $\chi^2$  (2, N = 116) = 1.71,  $p > .05$ ) no significant difference between the motivation levels of users and non-users.

**Table 5.11:** Use of OER and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Highly Agree		
Previous OER Use	No	Count	3	20	10	33
		% within Previous OER Use	9.1%	60.6%	30.3%	100.0%
	Yes	Count	3	49	31	83
		% within Previous OER Use	3.6%	59.0%	37.3%	100.0%
Total	Count	6	69	41	116	
	%	5.2%	59.5%	35.3%	100.0%	

Chi-Square = 1.711, df = 2, N = 116,  $p = 0.425$

## Contributors of OER

Table 5.12 shows that the majority of respondents had never contributed OER. Nonetheless, they had strong motivation to use and adapt OER; 64.6% of non-contributors and 46.9% of contributors agreed with the motivation statements, while 30.5% of non-contributors and 46.0% of contributors strongly agreed. The chi-square test revealed ( $\chi^2$  (2, N = 114) = 3.06,  $p > .05$ ) no significant difference between the motivations of contributors and non-contributors.

**Table 5.12:** Contributors of OER and Motivation Cross-tabulation

		Motivation			Total	
		Undecided	Agree	Strongly Agree		
Previous OER Contribution	No	Count	4	53	25	82
		% within Previous OER Contribution	4.9%	64.6%	30.5%	100.0%
	Yes	Count	2	15	15	32
		% within Previous OER Contribution	6.3%	46.9%	46.9%	100.0%
Total	Count	6	68	40	114	
	% within	5.3%	59.6%	35.1%	100.0%	

Chi-square = 3.061, df = 2, N = 114,  $p = 0.216$ .

## 5.4 Analysis of the Interactive Workshop Session

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In order to analyse further the motivations of the respondents to use and adapt OER, we conducted interactive sessions during the workshop (as described earlier), where we collected responses from some of participants and created an engaging environment for promoting the idea of OER for development. We used several questions to initiate dialogue and elicit responses. Some of the questions were: Do you have knowledge of OER? Why do teachers need a knowledge of OER? What benefits do you envisage gaining by using OER in teaching? What types of resources are useful in teaching and learning? What would you do to encourage yourself to share and create resources? What should your institution do, to further motivate you to use and contribute OER? The responses were diverse in the different workshops. We present a sample of these responses below.

### Extent of Knowledge about Licensing

Licenses differentiate OER from resources that are not open. During the workshop, we explained this to the participants. However, during the interactive session, it became clear that most had no previous knowledge about copyright and licensing and had not previously heard about Creative Commons. Some also expressed concern about misuse of online materials and confusion about the “public domain” concept. A few of the workshop participants’ comments follow:

I never heard even this word — Creative Commons license — before.

I usually used to access Wikipedia and see that licence underneath every page, but I wasn’t aware about it.

Before this workshop, I was always concerned would I be violating anyone’s copyrights or is it plagiarism or am I copying things which I should not. I have been paraphrasing materials and providing acknowledgement or citation... but, the license give[s] an opportunity to use the materials as such.

With knowledge of licensing, respondents in the workshop believed they could now create and share educational materials confidently, without fear of copyright infringement.

### Extent of Knowledge about OER

Knowledge about OER is necessary to use such resources for teaching and learning. We found that knowledge of OER was relatively low in the groups at the four institutions. However, some participants identified Wikipedia as OER, and some mentioned using Creative Commons licences in Slideshare.net to share their work. One respondent said:

[W]hen I started using Internet sources, for my teaching–learning activity and also for my research work, I have used OERs without knowing that they are OERs.

The teachers were using and sharing these resources without realising that they came under the OER umbrella, and they never bothered about the associated licences. However, interaction in the workshop changed some of their views about how to adopt OER:

Last time when we prepared the materials for our university, I was not aware of the OER. So we went in a very traditional way, referring to the available books in the print media and writing lesson... [N]ow, when revision of these courses starts, I will first search for OER.

One respondent believed that OER could be a “game changer” in education:

We can reuse, remix, remake and redistribute... [T]hese are of major significance for contextualising and improving learning.

While knowledge of licensing and OER are necessary to use and adapt OER, they are not sufficient condition for teachers to do so. The teachers’ intrinsic and extrinsic motivations encourage them to use and adapt OER.

## **Intrinsic Motivation towards OER**

As in the survey findings, most respondents were intrinsically motivated. They believed that using OER in their teaching and learning would help learners as well as themselves. They also believed OER are good for people, and they indicated that sharing educational materials is a basic academic value (Browne et al., 2010; Gaskell, 2011; Hilton & Wiley, 2010; Pegler, 2012).

OER could be a good source of learning for me.

[M]ost of the articles which I upload to the web are for the benefit of learners.

The respondents said that knowledge should be shared, as sharing is the best way of improving the educational system and making positive changes in society (Clements & Pawlowski, 2012; Tromp & Long, 2013).

I don’t have any problem in sharing my materials as open resources, because I also use materials created by others.

[K]nowledge is to share; if someone is getting the benefits, then it should be shared. Not only knowledge, our experience should also be shared.

[P]eople will be benefitted if I share... and I have been doing so.

In the Indian context, creating and sharing knowledge in indigenous languages, such as Hindi and Urdu, also has a positive impact. The teachers therefore want to create materials in their own languages or adapt the best materials to their contexts.

I’ll prefer to write on the topics upon which nothing is available. Yesterday I have registered on WikiEducator so I would like to write on those topics which are untouched. Secondly, I would like to write in Urdu so that Urdu literature students can be more benefitted.

Some teachers also believed that OER would help them to update their knowledge and learning experiences (Butcher & Hoosen, 2012). Many participants preferred to use and contribute to OER for self-satisfaction. They expressed that they feel happy while sharing (Hylén, 2006), as it is their role as teachers to share knowledge that informs them and their students.

I would love to share, as sharing is a human tendency, so I will share my materials to one and all without any incentives. It's not extrinsic motivation; I am intrinsically motivated, so I will share for serving humanity.

I am really very much interested; whatever I know, I just want to share it with others, just give it to others. I never like keeping or hiding things. I am of the opinion that India is a country which has been giving knowledge to the world even before this written form came into existence; India is the only country which has been using OER through oral transmission, as Vedas have been given to the world. Whoever comes and learns, we are free to give, so in that way I am really interested to give my resources.

Some of the respondents expressed that OER sharing in India will help the disadvantaged members of Indian society, because OER are accessible to those without access to formal education and therefore are helpful for disseminating knowledge through open and distance learning modes.

Naturally, OER can help us to share our material to [a] wider population... [I]t will be accessible across the globe.

[T]his is for social movement, this is for social cause and this is for the betterment of the world as a whole.

Overall, the majority of participants expressed that OER creation would be dependent on teachers' intrinsic motivation.

## **Extrinsic Motivation towards OER**

By and large, respondents were not aware of OER before the workshops; they were also intrinsically motivated to use and adapt OER. However, the respondents also expressed some extrinsic motivations for OER uptake. Most indicated the importance of policy — institutional or governmental — to increase the use and adaptation of OER. One respondent said:

[P]olicy can enhance. As an individual we cannot make that difference, but if it is like an institutional policy then definitely it will impact a lot and will reach more number of people... that policy will definitely be helpful for the institution to help the faculty members easily use OER.

When analysing the questionnaire, we found that extrinsic motivations, such as recognition (Harishankar, 2012; Hars & Ou, 2002; Reed, 2012; Rolfé, 2012), institutional reputation, professional development, institutional incentives (Olcott, 2012), and infrastructural and financial support were less important than intrinsic motivations; overall, respondents were allured to financial gain or incentives from

the institution to use and adapt OER. They also felt that OER creation should be considered equivalent to the work required for research papers and therefore should result in credit towards promotion; in India, the Academic Performance Index (API) is used to determine promotions. Respondents felt that such recognition would promote the use and adaptation of OER in India. One participant said that to encourage institutions to use and adapt OER,

Financial assistance could also be provided to the institutions to improve...  
[I]f no financial benefit or grant will be given, they will not think about that [OER].  
If you [the institution] show some interest and give some money to develop, then they [teachers] will come forward in order to utilise that opportunity.

Other respondents commented:

[A] university like ours which is catering [to] the needs of Urdu medium students, if it creates open access material then we will also become famous like others.

[U]sers must acknowledge, they must recognise and they must give the due credit that is due to me.

It will enrich my résumé if it is accepted or counted in API score.

## Need for Additional Support

Many respondents expressed their desire to receive additional support to use and adapt OER. They appreciated that the workshops, too, played a motivating role. However, a three-day workshop was not enough, and they indicated the need for regular training. They also indicated that student training was essential for the OER movement to succeed.

I feel awareness should be created among the learners to use OER.

From the perspective of contributor, proper knowledge, subject expertise, technical expertise, all is needed.

One teacher briefly discussed the need for OER training to support future developments:

[D]efinitely more training is required. This three-day workshop has given some kind of eye opening, and we have just seen the periphery of the concept of OER . . . if we get more knowledge about OER that will help us to contribute wholeheartedly.

## 5.5 Discussions

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Analysing the motivation of the respondents towards the use and adaptation of OER revealed that teachers were highly motivated to use, create and share OER for different academic, professional and individual purposes. They recognised that workshops organised as part of the project helped them become aware of the emerging platform of OER that could be integrated into their teaching and learning

experiences. Clements and Pawlowski (2012) discussed that raising awareness could promote the use and reuse of OER. Awareness and knowledge of OER emerged as a precondition for motivation towards OER. However, with respect to what motivated them to use and adapt OER, a variety of enabling reasons were identified. These were mostly intrinsic, but several extrinsic motivations would also play an important role in promoting the uptake of OER in India. These include recognition that could contribute to the teachers' recruitment and/or promotion, and opportunities for professional development, networking and image building. Many previous studies (Harishankar, 2012; Hars & Ou, 2002; Petrides et al., 2010; Reed, 2012; Rolfe, 2012; Terrasse et al., 2012; Tiwana & Bush, 2001; Wang & Noe, 2010) have also emphasised that recognition of OER work could promote OER practices in different contexts. While most of the questionnaire respondents indicated that they agreed or strongly agreed with the motivation statements, analyses also revealed that the respondents' qualification level and age played significant roles in their motivation to use and adapt OER. Respondents with doctoral degrees were more motivated to use and adapt OER than those who held only master's degrees, while younger teachers were more motivated to use and adapt OER than senior teachers. The former finding could be due to these academics' increased confidence and better skills in using the available literature, due to their research experience. However, the age factor could be related to ICT skills. In order to promote the uptake of OER in India, it is important to devise mechanisms that would boost teachers' intrinsic motivation, and also create enabling policies and mechanisms to recognise and reward individual work and foster a professional network of OER practitioners.

# Quality Perceptions of OER

## 6.1 Quality of OER

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“Quality” has been a salient subject of discussion in academic literature. There is near unanimity that quality assurance (QA) is no longer a matter of option or debate but rather one of absolute necessity. The unanimity ceases and divergence emerges once the methodologies for ensuring quality and determining its parameters are discussed. There are, indeed, many different paths and tools for QA in higher education (Mishra, 2007). While quality is viewed in general as “fitness for purpose and “continuous improvement,” the question of teachers’ perception of quality is important in the context of them using OER prepared by another individual. Within an organisation, quality is the result of a transparent, participatory negotiation process (Pawlowski, 2007). In the context of OER, the production values of OER are as important as the resources’ discoverability, accessibility and availability. This study therefore considers quality a characteristic that may have bearings on how teachers use and contribute to OER.

Schroter et al. (2005) found that although most of the teachers in their study favoured open access, only some of them submitted their work to open access journals. Their reasons for not submitting papers to such journals was related to the authors’ concerns about the journals’ perceived quality. It is believed that OER are “useful for improving teaching quality in areas such as providing illustrations, teaching difficult subjects, and supporting student progression” (Nikoi & Armellini, 2012, p. 174). But teachers remain concerned about the reliability and quality of OER content (Richter & Ehlers, 2010). Many in such studies expressed the fear that “resources were not good enough to be shared openly and that by releasing teaching materials they were making themselves vulnerable to receiving critical review from their colleagues” (Brent et al., 2012, p. 6).

There are several quality frameworks in the context of digital learning materials. Kawachi (2013, 2014a) explored 15 such frameworks in detail and introduced the TIPS Framework for OER QA.

*Accurate and authentic* information is the foremost criterion for determining the quality of OER. In a recent study, 82.6% of respondents agreed that OER provide



accurate and authentic information and come from reliable sources (Hussain et al., 2013). Hence, *appropriateness of content* and regular *updating* seem to be very important for all teachers/users. Dhanarajan and Timmers (1992) examined quality concerns from the user's perspective and identified ten issues, including curriculum/content, instructional design, academic standard, technical considerations, licensing arrangements and assessment strategies. These are also critical elements in determining the *appropriateness* of OER.

Appropriateness is about making resources taken from somewhere else suitable for one's own teaching (Wild, 2012). This very significant criterion of OER quality is also acknowledged in the phrase *fitness for purpose*, which sums up a series of responses related to the appropriateness of resources for a particular need. Respondents in a study by Brent and colleagues (2012) referred to this concept with phrases such as "relevance to topic," "quality of fit" for teaching and learning requirements, and "fit to my needs." Other respondents described quality with terms such as "academically rigorous" and "well informed." In addition, they made reference to "clarity," "accuracy" and "reliability." Many respondents also stated "ease of access," "easy to find," "user-friendly" and "readily accessible" as salient features of the quality resources they were seeking.

With respect to OER quality, "clarity" has been categorised under *pedagogic intent* (Wild, 2012). In some cases, it is difficult to find appropriate OER suitable for teaching purposes. From a teacher's perspective, the use of OER is dependent on the teaching objectives encompassed by the subject matter and adequate coverage of a specific topic (Atenas, Rojas, & Perez, 2012). Therefore, the notion of "*remixing*" is often posited as a way to ensure flexibility and relevance for divergent community contexts and pedagogical practices (Knox, 2013). Kanjilal (2013) also discussed relevance or fitness for use and pedagogic value as quality parameters for OER.

*Relevance and trust* of content are perceived as fundamental aspects of OER quality. Mtebe and Raisamo (2014b) found that the majority of facilitators in their study could not trace relevant resources according to their contextual needs. Moreover, some were not sure about the quality of OER, as the content was sometimes incomplete or not comprehensive.

Teachers show a strong inclination to use OER from their own institution, deeming it to be reliable (Brent et al., 2012). The existence of an institutional QA process encourages such trust (Dropper & Draaijer, 2013). Trust determines the value placed on the content and resources, which in turn can enhance an institution's reputation (Conrad, Mackintosh, McGreal, Murphy, & Witthaus, 2013). A report published by JISC (McGill, Falconer, Dempster, Littlejohn, & Beetham, 2013) similarly drew attention towards the essentiality of trust in establishing the quality of OER.

Clements and Pawlowski (2012) reported that 80% of respondents indicated they trusted institutions with a good reputation, and 50% mentioned that quality for them meant the resources came from an institution with a good reputation. This supports the notion that trust and quality are interlinked. Perceived quality of OER depends on the creators of content from these learning institutions. Thus, trust in

the institutions where individuals are producing learning content can facilitate high-quality OER and consequently reuse of OER (Clements & Pawlowski, 2012).

*Reusability* is a key aspect of quality for OER users. Context-free OER enable teachers to easily reuse and adapt materials. If OER can provide a framework for high-quality lessons, teachers can use their skills to improvise and adjust the OER for their own contexts. Pawlowski and Zimmermann (2007) described five key features in the process of OER reuse by teachers: search-ability, appropriateness, adaptability, sharing and reusability. The OER movement needs to consider such quality-related factors, as they offer teachers flexibility.

One of the issues peculiar to the reuse of resources is that their creators retain very little or no control over quality. There is the potential for reused learning resources to be improved, but equally, their quality can be degraded (Pegler, 2012).

Educational materials should be easy to find, and users should be able to download, integrate and adapt them across platforms (Yuan, MacNeill, & Kraan, 2008). It is believed that educational organisations and educators are often persuaded to integrate innovations with traditional institutional structures. Thus, aligning formal OER with traditional academic structures for recognition is somewhat complex. OER can take the form of a course or a single lesson, but it needs to have a specific purpose. Content instances can be compiled into lessons and lessons into modules. Further, these units can be accumulated to create a course, and a course may lead to a full programme. All of these at their various levels of granularity can be OER (McGreal, 2012). But this process requires scientific review by subject matter experts. Hence, peer review has been seen as a component of QA (Atenas & Havemann, 2013, 2014). Peer review based on approved criteria is considered appropriate for educational purposes (Musunuru, 2012). Clements, Pawlowski and Manouselis (2015) contributed a QA framework for learning object repositories, which revealed that collaborative instruments are most important for the QA of these repositories. They further discussed that expert review can be useful for evaluating some parts of the resources to be shared in a repository, but it is not an economical approach. Thus, they focused their findings on community participation in the creation of content and collaborative instruments, via peer reviews, comments and rankings.

Community participation in the review process leads to open users' reviews, which can make significant contributions to the evaluation of OER. This is achieved by having users comment on the resources available on the repository platform. Open peer review helps improve the quality of OER (Hilton & Wiley, 2010). It has also been indicated that due to peer review, contributors become conscious of the fact that their materials are scrutinised and used by a large audience around the world, and this motivates them to review and update their materials as required.

There are two approaches to quality: institutional and individual. The former uses institutional reputation to convince the user that the materials are of good quality. Institutions therefore must use internal quality mechanisms before their learning

material is shared (Musunuru, 2012). But some express concern over how an institution can ensure that its contribution is duly recognised. To this end, institutions need to put in place clear and transparent copyright policies and guidelines so that open licences are used as a starting point (Rolfe, 2012). Certainly, the role of individuals is key to the sustainability of OER in the long run, but institutions need to extend necessary support and resources to incorporate OER into educational practices (Atkins, Brown, & Hammond, 2007).

To enhance OER quality, it is essential to ensure a critical mass of active, engaged users and increased usability. OER require paying attention not only to the “product” but to understanding users’ requirements and refining the resources’ value for numerous user communities. The argument for such a method is that quality is not naturally embedded in learning resources but rather is a contextual phenomenon. Only the user can decide about its usefulness in a specific learning situation.

It has been found that OER can be a catalyst for change in teaching practices and in the lives of those who may not be able to afford tuition fees. Teachers have a better perception of OER quality when four standards are followed during its development: technical, linguistic, cultural and pedagogical (Wiley, 2007).

To sum up, there are diverse ways of approaching the issue of quality in OER. It can be done via a centrally designed procedure or within a decentralised system. Teachers play a significant role in developing and/or using OER in their own contexts and building a systematic approach to integrating OER in their institutions. Therefore, their belief in and perception of the quality of OER will significantly influence how OER are used in an institution or by individual teachers.

Quality issues are complex in the field of OER. While there is an increasing tendency to view educational materials produced by others through a critical lens, the intrinsic nature of OER enables improved quality due to the opportunity to contextualise materials so they are “fit for purpose.” There are several quality frameworks for educational materials. However, guidelines for assuring the quality of OER are limited. A range of issues influence teachers’ perceptions of OER quality, including the source of the material, trust, accuracy and accessibility. Reusability is also considered an important quality issue. Some teachers exhibit a “not invented here” syndrome, and other believe that using materials developed by others is inherently undesirable.

## 6.2 Perceptions of OER Quality

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The respondents’ perceptions of OER quality were studied using statistical analyses of their responses to 13 Likert-type quality statements collected through the questionnaire, and also using their input provided during the panel discussions at the workshops. Table 6.1 shows the overall results, which indicate that most of the teachers cared about the quality of OER ( $M = 3.99$ ,  $SD = 0.78$ ).

**Table 6.1:** Overall Analysis of Quality

Overall Analysis	Statistics
N	117
Items	13
Mean	3.99
Std. Error of Mean	0.07
Std. Deviation	0.78
Minimum	1.00
Maximum	5.00

Table 6.2 presents the 13 items in the Likert scale used to assess perceptions of OER quality. The range of means, from 3.49 to 4.46, reveals that most of the respondents

**Table 6.2:** Perceptions of OER Quality

Statements	Range	Minimum	Maximum	Mean		Std. Dev.
				Statistic	Std. Error	
OER saves teachers' time.	3.00	2.00	5.00	4.23	.06	.73
OER bring down the cost of learning materials.	4.00	1.00	5.00	4.37	.07	.77
OER are free resources available through open licences.	4.00	1.00	5.00	4.41	.07	.81
I don't need permission to reuse OER.	4.00	1.00	5.00	3.76	.11	1.19
I often use OER, which fulfil the <b>pedagogical needs</b> of the teaching–learning process.	3.00	2.00	5.00	4.07	.07	.81
If OER are <b>appropriate</b> in their content, I prefer to use them.	4.00	1.00	5.00	4.46	.06	.71
I prefer to use OER from <b>trustworthy</b> sources.	3.00	2.00	5.00	4.37	.072	.78
Open licensing of OER enables <b>continuous quality improvements</b> .	4.00	1.00	5.00	4.17	.08	.89
I use trustworthy OER from <b>reputed</b> institutions.	4.00	1.00	5.00	4.09	.09	.99
Lack of <b>peer review</b> of OER makes them susceptible to poor quality.	4.00	1.00	5.00	3.74	.09	1.05
OER help developing countries obtain quality materials.	4.00	1.00	5.00	4.05	.07	.81
The quality of OER is questionable.	4.00	1.00	5.00	3.49	.1	1.11
OER need <b>localisation</b> .	4.00	1.00	5.00	3.97	.1	1.14

agreed with the statements. Respondents felt that if OER were appropriate, they would use them ( $M = 4.46$ ). This indicates that respondents used their own criteria for appropriate, which is in tune with the philosophy of openness. They also perceived OER as free resources available under open licences ( $M = 4.41$ ), and they believed that OER bring down the cost of materials ( $M = 4.37$ ) and save time ( $M = 4.23$ ). Apart from appropriateness, the next important quality issue was the trustworthiness of the OER source ( $M = 4.37$ ). Another indicator of quality was whether the particular resource supports the pedagogical needs of the teaching–learning process ( $M = 4.07$ ). In addition, materials released by well-recognised institutions were also considered of high quality ( $M = 4.09$ ). The respondents also believed that open licensing enables continuous quality improvement ( $M = 4.17$ ). Accordingly, OER should be considered opportunities to improve educational resources and assist developing countries such as India to have quality materials ( $M = 4.05$ ). Respondents also agreed that OER need to be localised ( $M = 3.97$ ) and that lack of peer review makes resources susceptible to poor quality ( $M = 3.74$ ). In other words, the availability of OER mean they can be localised and contextualised to improve quality, but OER also should undergo the rigour of peer review. Notably, the respondents were neutral as to the quality of existing materials ( $M = 3.49$ ).

### 6.3 Differences in Perceptions of OER Quality

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In order to understand the differences in perception of OER quality, we conducted a set of statistical tests, taking into account several variables (gender, age, professional designation, subject of studies, highest qualification, teaching experience, nature of institution, OER user and OER contributor). Interestingly, none of these demographic variables revealed significant differences in perceptions of OER quality, apart from whether the respondent was an OER contributor.

#### Gender

Table 6.3 shows the relationship between gender and perceptions of OER quality. The proportions of male and female respondents answering positively about OER quality were 53.7% and 72%, respectively. On the other hand, 43.3% of male respondents strongly agreed with the statements about OER quality, compared with 24% of female respondents. Chi-square tests revealed ( $\chi^2 (2, N = 117) = 4.67, p > .05$ ) no significant difference between male and female respondents' perception of OER quality.

#### Age

In terms of age, almost two-thirds of the respondents (68.3%) under age 35 agreed with the quality statements, while half of the respondents aged 36 to 50 (52.3%) expressed the same view (Table 6.4). Respondents in the 36–50 group (43.2%) strongly agreed with the quality statements regarding OER. However, the chi-square test revealed no significant difference amongst the respondent age groups regarding their perceptions of OER quality ( $\chi^2 (4, N = 117) = 3.31, p > .05$ ).

**Table 6.3:** Gender and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
<b>Gender</b>	<b>Male</b>	Count	2	36	29	67
		% within Gender	3.0%	53.7%	43.3%	100.0%
	<b>Female</b>	Count	2	36	12	50
		% within Gender	4.0%	72.0%	24.0%	100.0%
<b>Total</b>	Count	4	72	41	117	
	%	3.4%	61.5%	35.0%	100.0%	

Chi-square = 4.67, df = 2, N = 117, p = 0.096.

**Table 6.4:** Age and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
<b>Age</b>	<b>&lt;35 years</b>	Count	2	41	17	60
		% within Age	3.3%	68.3%	28.3%	100.0%
	<b>36–50 years</b>	Count	2	23	19	44
		% within Age	4.5%	52.3%	43.2%	100.0%
	<b>51 years and above</b>	Count	0	8	5	13
		% within Age	0.0%	61.5%	38.5%	100.0%
<b>Total</b>	Count	4	72	41	117	
	%	3.4%	61.5%	35.0%	100.0%	

Chi-square = 3.31, df = 4, N = 117, p = 0.50.

## Professional Designation

Table 6.5 presents the pattern of distribution of respondents' professional designation/level and their perceptions of OER quality. Among assistant professors, 64.8% and 32.4% expressed agreement and strong agreement, respectively, that OER are of good quality. There were only seven professors among the sample, and most of them agreed with the quality statements. On the other hand, 52.9% of the associate professors agreed and 41.2% strongly agreed with the quality statements. The chi-square test revealed ( $\chi^2$  (6, N = 117) = 1.52, p > .05) no difference in perception of OER quality with respect to the respondents' professional designation level.

**Table 6.5:** Designation and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
Designation	<b>Assistant Professor</b>	Count	2	46	23	71
		% within Designation	2.8%	64.8%	32.4%	100.0%
	<b>Associate Professor</b>	Count	1	9	7	17
		% within Designation	5.9%	52.9%	41.2%	100.0%
	<b>Professor</b>	Count	0	4	3	7
		% within Designation	0.0%	57.1%	42.9%	100.0%
	<b>Others</b>	Count	1	13	8	22
		% within Designation	4.5%	59.1%	36.4%	100.0%
	<b>Total</b>	Count	4	72	41	117
		%	3.4%	61.5%	35.0%	100.0%

Chi-square = 1.52, df = 6, N = 117, p = 0.958.

## Discipline

Most of the respondents in the study were from the humanities and social sciences (including education and law), of which 61% and 31% indicated agreement and strong agreement, respectively, with the quality statements (Table 6.6). The majority of the respondents from management and commerce (72.7%) and the natural sciences (70%) also agreed with the quality statements. The chi-square test revealed ( $\chi^2$  (8, N = 117) = 8.96,  $p > .05$ ) no significant difference in perception of OER quality amongst the different disciplinary groups.

## Highest Qualification

Table 6.7 shows that most of the respondents in the study had a PhD; of these; 60.9% and 37.5%, respectively, agreed or strongly agreed with the statements regarding perception of OER quality. On the other hand, 61.4% of the respondents with bachelor's and/or master's degrees agreed and 31.8% strongly agreed with the statements. The chi-square test revealed ( $\chi^2$  (4, N = 117) = 2.73,  $p > .05$ ) no significant difference in perception of OER quality amongst respondents with different qualifications.

**Table 6.6:** Discipline and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
Discipline	<b>Humanities and Social Sciences (including Education and Law)</b>	Count	0	36	23	59
		% within Discipline	0.0%	61.0%	39.0%	100.0%
	<b>Management and Commerce</b>	Count	1	8	2	11
		% within Discipline	9.1%	72.7%	18.2%	100.0%
	<b>Natural Sciences</b>	Count	1	14	5	20
		% within Discipline	5.0%	70.0%	25.0%	100.0%
	<b>Engineering and Technology and Veterinary Science</b>	Count	2	14	10	26
		% within Discipline	7.7%	53.8%	38.5%	100.0%
	<b>Medical and Health Sciences</b>	Count	0	0	1	1
		% within Discipline	0.0%	0.0%	100.0%	100.0%
	<b>Total</b>	Count	4	72	41	117
		%	3.4%	61.5%	35.0%	100.0%

Chi-square = 8.96, df = 8, N = 117, p = 0.345.

**Table 6.7:** Highest Qualification and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
Highest Qualification	<b>Bachelor's and Master's Degrees</b>	Count	3	27	14	44
		% within Highest Qualification	6.8%	61.4%	31.8%	100.0%
	<b>MPhil</b>	Count	0	6	3	9
		% within Highest Qualification	0.0%	66.7%	33.3%	100.0%
	<b>PhD</b>	Count	1	39	24	64
		% within Highest Qualification	1.6%	60.9%	37.5%	100.0%
<b>Total</b>	Count	4	72	41	117	
	%	3.4%	61.5%	35.0%	100.0%	

Chi-square = 2.73, df = 4, N = 117, p = 0.604.



## Teaching Experience

Table 6.8 shows the distribution of responses in terms of years of teaching experience and perceptions about OER quality. The majority of the respondents had six to 15 years of experience; of these individuals, 56.3% and 43.8%, respectively, agreed or strongly agreed with the quality statements. Overall, the majority of the respondents agreed with the statements related to OER quality. The chi-square test revealed ( $\chi^2$  (8, N = 117) = 10.24,  $p > .05$ ) no significant difference in perception of OER quality amongst respondents with different amounts of teaching experience.

## Type of Institution

Table 6.9 reveals that 62.1% of the respondents from face-to-face teaching institutions and 61.5% of the respondents from distance teaching institutions agreed with the quality statements about OER. On the other hand, 57.9% from dual-mode institutions agreed, while 42.1% strongly agreed. The chi-square test revealed ( $\chi^2$  (4, N = 116) = 4.70,  $p > .05$ ) no significant difference in perceptions of OER quality amongst respondents from different types of institutions.

**Table 6.8:** Teaching Experience and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
Teaching Experience	0–5 years	Count	2	24	7	33
		% within Teaching Experience	6.1%	72.7%	21.2%	100.0%
	6–15 years	Count	0	27	21	48
		% within Teaching Experience	0.0%	56.3%	43.8%	100.0%
	16–25 years	Count	2	14	8	24
		% within Teaching Experience	8.3%	58.3%	33.3%	100.0%
	26–35 years	Count	0	5	5	10
		% within Teaching Experience	0.0%	50.0%	50.0%	100.0%
	More than 35 years	Count	0	2	0	2
		% within Teaching Experience	0.0%	100.0%	0.0%	100.0%
Total	Count	4	72	41	117	
	%	3.4%	61.5%	35.0%	100.0%	

Chi-square = 10.24, df = 8, N = 117,  $p = 0.248$ .

**Table 6.9:** Nature of Institution and Quality of OER Cross-tabulation

			Median Quality			Total
			Undecided	Agree	Strongly Agree	
Type of Institution	Face-to-face Teaching	Count	4	36	18	58
		% within Type of Institution	6.9%	62.1%	31.0%	100.0%
	Distance Education	Count	0	24	15	39
		% within Type of Institution	0.0%	61.5%	38.5%	100.0%
	Dual-mode Teaching	Count	0	11	8	19
		% within Type of Institution	0.0%	57.9%	42.1%	100.0%
Total	Count	4	71	41	116	
	%	3.4%	61.2%	35.3%	100.0%	

Chi-square = 4.70, df = 4, N = 116, p = 0.320.

## OER Users

Table 6.10 shows that the majority of respondents were users of OER, of whom 62.7% agreed with the statements related to OER quality and 33.7% strongly agreed. Of those who had never used OER, 60.6% agreed and 36.4% strongly agreed with the statements about OER quality. The chi-square test revealed ( $\chi^2$  (2, N = 116) = 0.08,  $p > .05$ ) no significant difference in perception about OER quality between users and non-users of OER.

**Table 6.10:** OER Use and Quality of OER Cross-tabulation

			Median Quality			Total
			Undecided	Agree	Strongly Agree	
Previous OER Use	No	Count	1	20	12	33
		% within Previous OER Use	3.0%	60.6%	36.4%	100.0%
	Yes	Count	3	52	28	83
		% within Previous OER Use	3.6%	62.7%	33.7%	100.0%
Total	Count	4	72	40	116	
	%	3.4%	62.1%	34.5%	100.0%	

Chi-square = 0.08, df = 2, N = 116, p = 0.958.

## OER Contributors

The majority of the respondents had never contributed OER; among them, 69.5% and 29.3%, respectively, agreed or strongly agreed with the statements about OER quality. On the other hand, half of the OER contributors were strongly in agreement with and 40% agreed with the statements (Table 6.12). The chi-square test indicated a significant difference in perceptions of OER quality between contributors and non-

contributors ( $\chi^2 (2, N = 114) = 10.31, p < .01$ ). This indicates that non-contributors were more concerned about OER quality than contributors, although both groups largely agreed on quality concerns.

**Table 6.11:** Previous OER Contribution and Quality of OER Cross-tabulation

		Median Quality			Total	
		Undecided	Agree	Strongly Agree		
<b>Previous OER Contribution</b>	<b>No</b>	Count	1	57	24	82
		% within Previous OER Contribution	1.2%	69.5%	29.3%	100.0%
	<b>Yes</b>	Count	3	13	16	32
		% within Previous OER Contribution	9.4%	40.6%	50.0%	100.0%
<b>Total</b>	Count	4	70	40	114	
	%	3.5%	61.4%	35.1%	100.0%	

Chi-square = 10.31, df = 2, N = 114, p = 0.006.

## 6.4 Analysis of the Workshop Session on OER Quality

In order to analyse the teachers' perceptions of OER quality, we organised a panel discussion on quality in an engaged environment during the workshops, where we collected responses from some of the participants. The panellists were drawn from the participants and were asked to articulate their views on OER quality, while the other participants challenged them with questions and comments. We captured these discussions as qualitative data. In this session, concerns were raised about definitions of quality, indicators of OER quality, the need for quality in OER and who should ensure quality in OER.

These sessions revealed that quality is subjectively defined and depends on context. It is an elusive concept, as it can be defined differently by all who measure it and it is affected by the context in which the measurement is taken. The participants claimed to find it difficult to obtain quality materials to support their teaching and learning. Some of the teachers opined:

[S]ome materials are not that well designed, not well structured . . . we must be concerned about content . . . let it be unstructured, but if content is good then fine.

[I]t's only the quality issue which bothers sometimes. If I am going to a very reputed forum, there is information which is not from a very trustworthy source, I may not quote it. I will search for something on which nobody will question. Because if somebody questions, then your credibility depends on that.

There was agreement that accountability for the quality of OER materials lies equally with authors, editors and the institution hosting or uploading these resources. Quality was agreed to be indispensable, as OER can potentially reach a large number

of users. Participants also suggested the adoption of multi-disciplinary approaches and peer reviews, and pointed to the importance of authorial sincerity and of a central monitoring authority. Some also emphasised getting informal feedback from colleagues as highly important to ensure quality.

I am very concerned about quality because writing for me is serious stuff... When I write, I try to share it with my colleagues to receive their feedbacks on what they think, and most of the time it's good.

If I share my ideas with others, I will be getting feedback, and those inputs can make my material more effective and it will improve my confidence that I am sharing with global community.

The participants also discussed where responsibility lies for ensuring OER quality. They felt it resides mainly with the institution, programme or course co-ordinators, and individual educators accountable for education delivery. As some of the teachers emphasised that responsibility for ensuring the quality of OER remains with the institutions developing and promoting OER:

[The] institution as a whole... it's a combination of individuals, and when all individuals start using OER, create and put it on Internet [in a repository], the institution as a whole will have respect for OER.

Quality is necessary. First of all, we should be satisfied about what we have written. Does it fulfil the needs and expectations of the learners? There should be authenticity. Nothing should be wrong in the self-learning materials which we prepare. Secondly, I think there should be an editor or board of editors who check seriously all the text [contents], not only the language. So it should be checked on both levels — individual as well as institutional.

Moreover, respondents discussed the important role of teachers as facilitators in selecting and recommending quality resources to their students. According to some, teachers are accountable for providing a better experience of knowledge creation and sharing. Similarly, institutions need to take leadership in OER quality assurance. Quality can also be assured by review through collaboration. One teacher said:

[C]ollaboration will help [with] building good content and also different thinking... By collaboration, these materials can be well designed and better prepared.

## 6.5 Discussions

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The following are some of this study's important findings related to perceptions of OER quality:

- Respondents used their own criteria of appropriateness to measure OER quality, which is in tune with the philosophy of openness.
- The trustworthiness of OER sources was important for the respondents. The reputation of the source was also a noteworthy matter for them when deciding on quality.

- To be considered quality materials, OER should support the pedagogical needs of the teaching–learning process.
- An open licence is itself an indicator of quality, as it provides the opportunity for continuous improvement.
- Respondents agreed that OER need to be localised and adapted to specific contexts to be fit for purpose.
- OER should undergo the rigour of peer review to be considered quality materials.
- OER quality assurance should be the responsibility of those who prepare the materials, and institutions should create mechanisms to assure quality.

Discussions with respondents revealed that selection of the right kind of OER is important to contextualise them and adapt them so they are fit for purpose. The real measure of a material's quality is based on the students' learning outcomes and whether/how it helps them to learn better. This is supported by Nikoi and Armellini (2012), who believed that OER should enable students to progress. The teachers in the present study pointed out that OER should be learner-centric and created according to the students' level and context. Some of the teachers debated about quality assurance processes and quality indicators at two levels — i.e., quality as product and quality as process. Along with teachers using self-assessment, institutions should have guidelines for quality assessment. Various individuals and institutional efforts, including self-critical evaluation, community participation, peer review and institutional quality assurance policies, can positively ensure the quality of OER. It was further discussed that the process is more important than the product, as the product can be continuously improved and contextualised due to the use of open licences. Reviews by subject experts are also useful to ensure quality (Hilton & Wiley, 2010). Peer review and feedback from large group collaboration are tools for ensuring OER quality. Clements, Pawlowski and Manouselis (2015) supported the collaborative approach to raising the quality of OER, and this method was discussed by many teachers in the present study. Knox (2013) indicated that flexibility and relevance to diverse community contexts are important factors in OER quality. Keeping content up to date was discussed as a quality factor by Terrasse et al. (2012).

We found that many of the issues identified by the respondents were also covered in the CEMCA publication titled *Quality Assurance Guidelines for Open Educational Resources: TIPS Framework* (Kawachi, 2014a). However, the respondents in this study emphasised fitness for purpose as the foremost criterion for assessing the quality of OER (Wild, 2012). The trustworthiness of the source and reputation of the organisation responsible for the OER have also been identified as quality issues (Clements & Pawlowski, 2012; Conrad et al., 2013). The suitability of OER for teaching and learning needs (i.e., pedagogical purposes) was also identified as another quality issue; this is supported by Wiley (2007), who said that by nature, OER are perceived to have better pedagogical standards.

Participants agreed that accountability for OER quality lies equally with authors, editors and the institution hosting or uploading these resources. Musunuru (2012)

in his study also placed importance on institutional efforts to establish the quality of learning materials. While the findings of the present study are consistent with those in the existing literature, we also found that quality perception is related to OER contribution. Those who contribute to OER are probably less obsessed with quality, but they are concerned about quality and make every effort to improve. Those who have never contributed OER are more sceptical about the quality of these resources. This calls for creating strategies to assist teachers in beginning to develop OER rather than simply remaining doubtful.

# Barriers to Use and Contribute OER

## 7.1 Barriers to OER

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Our extensive survey of the related literature yielded a comprehensive picture of the barriers in adopting OER. As per the Technology Adaptation Model (Davis, 1989), perceived ease of use (about a particular technology) and perceived usefulness (of the particular technology) influence behavioural intention to use a particular technology or innovation. Accordingly, barriers to the use of technology can arise:

- When external factors are not able to influence the perceived ease of use;
- When external factors are not able to influence the perceived usefulness;
- When perceived ease of use is not able to manifest itself in perceived usefulness;
- When both perceived ease of use and perceived usefulness are not able to interact to make a change in behavioural intention to use; and
- When behavioural intention fails to implement itself in the actual use of technology.

According to the diffusion of innovation theory (Rogers, 1995), people can be classified into five kinds in terms of their approach to innovation: innovators, early adopters, early majority, late majority and laggards. These people differ in their perspectives on innovation (see Table 7.1). Research shows that only 2.5% people are innovators in the true sense, while 13.5% are early adopters, 34% are early majority and 34% are late majority. About 16% are laggards, and it is very difficult to turn these people towards any innovation (Rogers, 1995). This research indicates that focusing on the early adopters and early majority helps speed up the diffusion of innovation.

**Table 7.1:** Categories of Innovators and Their Behaviour (adapted from Moser, 2007)

	Risk-taking Behaviour	Perception about Barriers	Learning Method	Perception about Learning New Technology
Innovators	High	Take them as challenges and seek innovative solutions	Self-learning	Eager to learn new technology
Early Adopters	Moderate	Accept challenges	Innovators	Forerunners, high propensity to adopt
Early Majority	Average	Adopt technology when initial problems are resolved and a lot of support is available	Early adopters and innovators	Do not want to be left behind, propensity to adopt
Late Majority	Low	Are able to overcome barriers through peer support	Not involved in the process unless forced	Peer pressure, propensity to resist
Laggards	Very low	Are unwilling to seek solutions to barriers	Not involved in the process	Sceptical, high propensity to resist

As one moves from innovators to laggards, the barriers faced may be more or less similar but the efforts, zeal and determination to overcome the barriers decreases progressively. The Technology Adaptation Model and diffusion of innovation theory inform us that innovations are received well and used by stakeholders based on perceived ease of use, perceived usefulness, perceptions about barriers to using the technology/innovation, and other personal characteristics, such as ways of learning and willingness to learn new technology.

OER can be viewed as an innovation in the field of education that increases access to educational opportunities for many and provides access to quality learning materials. Through extensive scrutiny of the related literature, we have identified several categories of barriers to the adoption of OER: institutional; personal; technical; copyright and legal; social, cultural and language; curricular and pedagogical; and economic. It has been observed that no barrier to OER exists in isolation, and various aspects of the barriers interact, act in tandem and influence individual behaviour. A study at the Washington Community and Technical Colleges revealed six major challenges in implementing OER in their classrooms: lack of time, institutional skepticism, lack of technology and skills with technology, feelings of uncertainty regarding the quality of the materials and its perception by others, difficulty in reviewing the materials, and differences in course specifications, such as scope and level of the course. (Chae & Jenkins, 2015)

The institutional barriers range from lack of policy, lack of recognition and incentive mechanisms, and insufficient financial input to lack of training and support mechanisms. Lack of policy results in vagueness and confusion among faculty members about ownership of, credit for and rights over the learning materials produced. The individual barriers largely emerge as an outcome of institutional



barriers. However, lack of technical skills, doubt about the quality of their materials, time constraints around learning new skills and practicing them, the lack of financial gains from the learning materials produced, as well as hosting and uploading of learning materials are some of the other prominent personal barriers. Technical barriers contribute to individual barriers and manifest as institutional barriers. Some of the technical barriers include issues such as poor/unreliable power supplies, inadequate software and incompatibility with various popularly used software and platforms. Curricular and pedagogical barriers concern the incompatibility of curricula with technological innovations in education. Differences in pedagogical approaches, taken up at different levels of education and in different contexts, and their mismatch with innovations, also result in barriers. Cultural barriers relate to the predominant practices and views of the recipients, and the external imposition of technology and innovation from dissimilar cultures; the language of communication also becomes a barrier if it is not understood by the user community. Economic concerns are connected to both individuals and institutions, in different ways. Individuals worry about losing financial benefits they may otherwise gain from their creative works, and institutions are apprehensive about the financial inputs required to establish and run OER initiatives. Potential loss of revenue is also a barrier to the adoption of OER in institutions that depend on the purchase of educational materials for teaching and learning.

### **7.1.1 Institutional Barriers to OER**

Lack of institutional policy on OER (Davis et al., 2010; Hart et al., 2015; Smith, 2013; Terrasse et al., 2012) has been identified as a major barrier to the adoption and use of OER. A clear OER policy removes all doubts pertaining to the use of OER amongst academics and administrators. Lack of policy raises issues such as ownership rights (Davis et al., 2010; Rolfe, 2012) and rights over the publication of the materials (Davis et al., 2010; OECD, 2007; Reed, 2012).

Apart from policy, not recognising and rewarding teachers' use of and contribution to OER is another institutional barrier. Lack of any kind of appraisal, reward and recognition (Glennie et al., 2012; Tabata & Johnsrud, 2008), incentives (Tabata & Johnsrud, 2008; Kursun et al., 2014) or encouragement (Glennie et al., 2012; Yuan et al., 2008) inhibits faculty members from using OER or actively contributing to the institutional OER repository.

An institution's inability/unwillingness to have skilled resource personnel for training (Coughlan et al., 2013), including a mentor or resource person who can help promptly to resolve problems (Jameela, 2014; Karunanayaka & Naidu, 2013), can render teachers unable to use OER. At the institutional level, out-of-date library collections and limited access to paid online databases (Kelly, 2014) also hinder faculty from using and adopting OER.

### 7.1.2 Personal Barriers to OER

The largest number of barriers to OER are encountered at the individual level by people who have the potential to be involved in creating, reusing, revising, remixing and redistributing OER. Most of these personal barriers are related to the knowledge and ICT skills relevant for OER.

Hatakka (2009) compared two developing countries (Bangladesh and Sri Lanka) to understand teachers' level of awareness about OER and IT literacy. Lack of knowledge of open content was most apparent in Bangladesh, as the respondents had low IT literacy and Internet usage. A few respondents were well aware of OER but struggled to find them on the Web or the Internet due to their low IT and informational literacy. Venkaiah (2008) reported that 81.90% of the respondents had difficulty accessing OER web links. Creating OER using Creative Commons licensed learning objects is also a concern for some faculty members (Harishankar, 2013; Mtebe & Raisamo, 2014a). Confusion amongst teachers regarding plagiarism and copyright issues is also a barrier to the adoption and use of OER (Harishankar, 2013). As well, faculty members are sometimes unaware of existing OER materials (Mtebe & Raisamo, 2014a), or find it difficult to search for and obtain suitable and relevant materials (Hart et al., 2015; Mtebe & Raisamo, 2014b). These challenges are a clear sign for institutions to engage in capacity building so as to keep their teachers updated about new developments in technology as well as related areas. Lack of pre-service and in-service training on OER is a prime cause of teachers fearing that they will inadvertently violate copyright. Lack of skills (Beaven, 2013; Coughlan et al., 2013; OECD, 2007; Hylén, 2006; Mtebe & Raisamo, 2014b; Ossiannilsson & Creelman, 2012), training and assistance to produce OER-compatible formats (Coughlan et al., 2013) are also barriers that must be overcome.

*Lack of professional recognition* or reward for producing and sharing OER were also noted as a factor in teachers not sharing OER. Absence of a central channel for sharing within an institution can inhibit the distribution of digital resources (Friesen, 2009; Seonghee & Boryung, 2008). Seonghee and Boryung (2008) noted that failure to share OER was sometimes due to faculty members' ignorance about who would use the OER or how such sharing could be done.

There are also many teachers who do not feel like sharing their resources. One of the determinants is the *time invested* in the development of educational resources. Hew and Hara (2007) found that teachers may be less open about sharing if, after spending a lot of time, they find the benefits to be inadequate. Similar results were reported by Kankanhalli et al. (2005), who found that less sharing occurred if more time was involved in creating the resources. There are concerns that faculty are sometimes so involved in teaching that contributing OER will lead to higher work pressure (Harishankar, 2013), and that they will have less or no time to find suitable materials (Clements & Pawlowski, 2012; Coughlan et al., 2013; Friesen, 2009; Harishankar, 2013; Hart et al., 2015; Hilton & Wiley, 2010; Mtebe & Raisamo, 2014b; Ossiannilsson & Creelman, 2012; Prasad & Usagawa, 2014; Prior, 2011; Rolfe, 2012; Tabata & Johnsrud, 2008) or to engage in innovation,

professional development and experimentation with new technology (Beaven, 2013; Clements & Pawlowski, 2012; Friesen, 2009; Tabata & Johnsrud, 2008; Terrasse et al., 2012). Various other reasons have been cited as well, such as: (a) the amount of time necessary to put the OER into a format that can be shared; (b) a desire to keep the resource from being seen by others; (c) external reward mechanisms for creating OER; (d) a concern that nobody will want to use the OER they create (Hilton & Wiley, 2010).

In addition, possible *loss of appreciation for an individual's unique competencies* is also considered an important factor hindering knowledge sharing (Renzl, 2008). Bakker, Van Emmerik and Euwema (2006) found that teachers were less inclined to share knowledge with colleagues even when they were capable of doing so, for fear of criticism or because they felt their colleagues were more competent. Ossiannilsson and Creelman (2011) have talked about acknowledging the role of the “sage on the stage” and how Internet-based resources may weaken such individuals’ authority. “Pride in ‘my class and ‘my course’ should not be underestimated and this leads to a natural reluctance to share resources and a suspicion of others’ material” (Ossiannilsson & Creelman, 2011, p. 376).

### 7.1.3 Technical Barriers to OER

Technical barriers contribute to some of the individual barriers that later manifest as certain institutional barriers. An inadequate IT infrastructure will give faculty fewer opportunities to interact with OER, resulting in less institutional innovation in the field, which thereby becomes an institutional barrier. The most basic technical barrier faced is a poor or unreliable power supply (Hussain et al, 2013). Even the most motivated person becomes demotivated to work when technology fails due to lack of electricity and/or failure in the timely restoration of power. Inadequate infrastructure in terms of labs, computers (shared or individual) and other required equipment (e.g., audio-video recording devices) also hinders the creation, revision and remixing of OER and becomes a barrier (Coughlan et al., 2013; Dhanarajan & Porter, 2013; Hart et al., 2015; Hylén, 2006; Mtebe & Raisamo, 2014a, 2014b).

Unfamiliar pedagogical terms and formats of materials in repositories (Davis et al., 2010) are further technical barriers, as is a lack of skills in using Web 2.0 technologies as a core of the OER learning environment (Terrasse et al., 2012).

OER is dependent on the Internet for global access, but Internet access is still not affordable for most of the developing and least-developed nations. Poor bandwidth is also sometimes a barrier even when the Internet is accessible (Hussain, 2013; Mtebe & Raisamo, 2014a, 2014b; OECD, 2007). There are also worries about bugs and virus infecting systems (Hussain et al., 2013), leading many users to take a cautious approach when using the Internet, which in turn restricts their access to OER as well as their reuse, remixing and redistribution of these resources. In institutes with some kind of university learning management system (LMS), there are also issues of incompatibility between OER and the LMS (Davis et al., 2010). Compatibility may be related to the software or platform used (Ossiannilsson & Creelman, 2012)

or to the format of files (D'Antoni, 2009; Dhanarajan & Porter, 2013; Yuan et al., 2008). Difficulties with editing and localising the created OER hinders their revision, remixing and redistribution (Pegler, 2012).

#### **7.1.4 Legal Barriers to the Use of OER**

Legal aspects are also a reason that some teachers take a guarded approach to OER. Little knowledge or understanding of Creative Commons or of ownership over OER materials may prevent some from contributing. Rolfe (2012) found that some teachers do not participate due to feelings of insecurity about protecting their work. In addition, a recent study in South Africa noted that the largest factor in faculty members' reluctance to share was their concern that others would make money out of their efforts (Hart et al., 2015).

As mentioned, legal issues mostly pertain to ignorance about Creative Commons licences and the proper use of copyrighted materials. Authors of OER are concerned about violating copyright claims while creating OER materials (Davis et al., 2010; Glennie et al., 2012; Mtebe & Raisamo, 2014b) by using downloaded and reused content without the explicit permission of the author or publisher (Beaven, 2013; Clements & Pawlowski, 2012; Harishankar, 2013; Prior, 2011). The proper attribution of credit for the materials produced is another leading concern for many faculty engaged in OER creation (Harishankar, 2013; Kursun et al., 2014).

Teachers assume that they own the resources that they create, so the issue of *ownership* can be a factor in whether or not they share. Most institutions have a copyright policy for the teaching and assessment resources their faculty create (Davis et al., 2010), granting the institution the right to continue using those resources. There are instances when an employee leaves an institution and deletes or removes the resources they produced, thus preventing the institution from using those materials. Davis et al. (2010) recommended ensuring that teachers have a sufficient understanding of copyright and intellectual property as those relate to the materials they create. Reed (2012) noted similar confusion among faculty about their materials and authorship/ownership rights.

Similar confusion was also highlighted in Rolfe's (2012) research, with 50% of respondents believing that the copyright resided with the university, 16% with the individual and 24% not knowing.

#### **7.1.5 Curricular and Pedagogical Barriers**

Curricular and pedagogical barriers are the outcomes of rigidity with respect to innovation in teaching practices (D'Antoni & Savage, 2009; Friesen, 2009; Hylén, 2006; OECD, 2007; Pegler, 2012; Tabata & Johnsrud, 2008). Lack of innovation can be attributed to lack of skills (OECD, 2007) or to cultural obstacles against sharing (Clements & Pawlowski, 2012; Coughlan et al., 2013). These barriers also emerge from the non-contextual and non-culturally sensitive aspects of some OER (Hart et al., 2015; OECD, 2007). The fallout is that OER sometimes are not

adaptable for specific sets of users (Coughlan et al., 2013) for various reasons, from contextual differences to differences in teaching strategies, curricula and so forth. Kelly (2014) reported that there has been no systematic integration of OER into curricula, and that some educational practitioners may not be aware of even the best-known repositories.

### **7.1.6 Socio-cultural and Linguistic Barriers**

Some barriers emerge from the traditions, socio-cultural norms and attitudes of particular societies — for example, maintenance of the status quo, or unwillingness to embrace something new simply for fear of what people might think of it, or because it may not be acceptable to the majority of the community, or out of uncertainty about the unknown. Traditional methods of teaching–learning and assessment are largely individualistic in nature. They are aimed at the learner in isolation; even when there is a group activity in traditional classrooms, there is limited group learning taking place. The development and use of OER can be a collaborative process, including between teachers and learners, which is an altogether different practice. As mentioned earlier, it has been observed that some teachers are hesitant to share their materials (Davis et al., 2010; Rolfe, 2012) and have less faith in materials created by others (Hilton & Wiley, 2010; Pegler, 2012). Since most of OER materials are currently produced in Western countries and used throughout the world — mainly in developing and least-developed countries — contextual relevance (Mtebe & Raisamo, 2014a; Terrasse et al., 2012) and cultural biases (Clements & Pawlowski, 2012; Coughlan et al., 2013; OECD, 2007; Prior, 2011) are barriers to their adoption. Learning from a screen in a virtual environment (Hussain, 2013) is also seen as a hindrance by some as people who are more used to a traditional classroom teaching–learning environment.

### **7.1.7 Economic Barriers**

Economic barriers are concerns for both individuals and institutions, but in different ways. Individuals worry about lost potential for financial gain from their creative works (Davis et al., 2010), whereas institutions are apprehensive about the financial investment required to establish and run OER initiatives (OECD, 2007; Reed, 2012; Tabata & Johnsrud, 2008). Furthermore, there is no accepted or well-established sustainable business model for OER practice (Butcher & Hoosen, 2012; Friesen, 2009; Terrasse et al., 2012). OER are mostly created and accessed through the Internet, requiring appropriate hardware and platforms (Dhanarajan & Porter, 2013; Hylén, 2006; Kelly, 2014; OECD, 2007; Prior, 2011). Insufficient financial support at the management level (Hart et al., 2015) is also a barrier to engagement with OER. Potential loss of revenue can prevent the adoption of OER in institutions that are dependent on payment for the use of educational materials for teaching and learning. Private-sector universities are more concerned with losing their competitive edge and decreasing their revenue by making their content open (D’Antoni & Savage, 2009; Davis et al., 2010; Glennie et al., 2012; Terrasse et al., 2012).

There are several barriers to the use and adoption of OER. However, all of these barriers co-exist and interact in tandem to influence the behaviour of a given individual. Amongst all these interconnected barriers, personal ones are the most prominent according to most of the studies — including lack of awareness about OER and licensing, the absence of recognition or rewards, concerns about the quality of their own developed materials, lack of training and support, and increased work pressure. Technical barriers are associated with institutional barriers, and the absence of institutional policies on OER is a significant obstacle.

## 7.2 Barriers to Using and Adapting OER

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There are several barriers to OER uptake. While the respondents in this study had relatively positive attitudes and were intrinsically motivated to use and adapt OER, these are not sufficient factors for mainstreaming OER in Indian higher education institutions. We analysed 18 different barriers that may affect OER use and adaption by individual teachers in institutions. These barriers are in different categories, including personal, institutional, technical, legal, economic, linguistic and pedagogical. We asked the respondents to identify only the five top barriers and rank these 1 to 5, from highest barrier to lowest.

These results are presented in Table 7.2, which shows that the most important barrier to OER is lack of understanding of intellectual property licences, copyright and CC licences. This calls for increased capacity building and awareness creation to promote the use of OER. The respondents believed that their current workload is the second most important barrier. If OER are to be mainstreamed, it is important to integrate OER work into the current teaching and learning system. The respondents in this study by and large saw OER as additional work, so they viewed their current workload as a barrier to doing any additional work to develop OER. The third barrier in the list is about recognition and reward. While teachers are intrinsically motivated, these results indicate that teachers would use and adapt OER more if they understood these resources better, had more release time to work on OER, and received recognition for this work. Interestingly, the top three barriers can be classified as “personal barriers,” although the issue of licensing is largely about understanding the legal implications of sharing and using materials. The fourth and fifth barriers are institutional in nature, related to funding and increased technological support. While some of the respondents saw technological issues, pedagogical issues and institutional policy as barriers, these are interestingly not at the top of the list. The “other” barriers mentioned by teachers are related to perceptions of OER quality and lack of awareness about OER.

During the workshops, we organised discussions around barriers to OER as snowball sessions, wherein we collected data on barriers from the respondents. The frequency counts based on these snowball sessions are presented in Table 7.3, and they support the top barriers as determined from the questionnaire data. The analysis revealed that personal barriers (22.47%) were at the top of the list in all the workshops.

Infrastructural barriers came second, with respondents highlighting issues related to access, bandwidth and lack of support as critical barriers. These were followed by issues of quality; respondents were apprehensive about the quality of the OER they might use in their teaching. The legal barriers were largely related to a lack of understanding of OER and copyright, while some also were connected to the challenges in using licences in remix situations.

**Table 7.2:** Analysis and Ranking of Barriers

Barriers	Choices					Cumulative			Weighted	
	1	2	3	4	5	Score	Rank	%	Score	Rank
<b>Lack of understanding of intellectual property licences, copyright and Creative Commons licences.</b>	<b>23</b>	<b>11</b>	<b>7</b>	<b>6</b>	<b>8</b>	<b>55</b>	<b>1</b>	<b>47.00</b>	<b>200</b>	<b>1</b>
Lack of knowledge about using OER in my teaching and learning processes.	7	8	3	7	5	30	8	25.64	95	7
<b>Lack of recognition and rewards system for developing OER.</b>	<b>9</b>	<b>6</b>	<b>13</b>	<b>7</b>	<b>12</b>	<b>47</b>	<b>3</b>	<b>40.17</b>	<b>134</b>	<b>3</b>
<b>Lack of financial resources at the institution to invest in OER.</b>	<b>1</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>4</b>	<b>35</b>	<b>5</b>	<b>29.91</b>	<b>99</b>	<b>5</b>
<b>Lack of technological support to resolve my problems.</b>	<b>7</b>	<b>9</b>	<b>3</b>	<b>13</b>	<b>6</b>	<b>38</b>	<b>4</b>	<b>32.48</b>	<b>112</b>	<b>4</b>
Inability to find existing OER on topics of interest to me.	7	6	7	4	4	28	10	23.93	92	8
Lack of confidence about the quality of my work.	1	3	5	3	4	16	15	13.68	42	16
Incompatibility of OER with my university learning management system (LMS).	3	3	4	4	3	17	14	14.53	50	13
Difficulty with remixing OER for specific users.	6	6	2	6	4	24	11	20.51	76	11
Unavailability of OER in my native language.	3	4	1	2	9	19	13	16.24	47	14
Lack of ICT skills required to create OER.	4	3	7	4	4	22	12	18.80	65	12
Lack of institutional policy on OER.	3	6	9	8	7	33	6	28.21	89	9

*Contd...*

Barriers	Choices					Cumulative			Weighted	
	1	2	3	4	5	Score	Rank	%	Score	Rank
Non-user-friendly OER platforms.	1	3	4	4	2	14	16	11.97	39	17
Poor technical infrastructure.	4	5	7	7	6	29	9	24.79	81	10
Difficulty in collaboration.	3	1	5	5	3	17	14	14.53	47	14
Inadequate bandwidth.	1	4	4	3	4	16	15	13.68	43	15
<b>Current workload.</b>	<b>20</b>	<b>13</b>	<b>6</b>	<b>5</b>	<b>7</b>	<b>51</b>	<b>2</b>	<b>43.59</b>	<b>187</b>	<b>2</b>
Lack of time.	6	7	7	6	5	31	7	26.50	96	6
Other barriers.	0	1	0	0	1	2	17	1.71	5	18

**Table 7.3:** Barriers: Frequency as Determine in Workshop Sessions

Barriers	Workshop 1	Workshop 2	Workshop 3	Workshop 4	Total	%
Personal barriers	12	10	11	7	40	22.47
Infrastructural barriers	7	8	7	5	27	15.17
Quality issues	3	5	4	5	17	9.55
Legal barriers	4	7	4	2	17	9.55
Lack of awareness	6	5	3	2	16	8.99
Technical skill barriers	6	3	4	2	15	8.43
Institutional barriers	10	2	1	1	14	7.87
Cultural and language barriers	4	0	5	2	11	6.18
Pedagogical barriers	2	0	4	1	7	3.93
Workload/lack of time	4	0	1	1	6	3.37
Financial/economic barriers	2	0	2	1	5	2.81
Lack of expertise	1	0	1	0	2	1.12
Lack of feedback	0	0	0	1	1	0.56
<b>Total</b>	<b>61</b>	<b>40</b>	<b>47</b>	<b>30</b>	<b>178</b>	



## 7.3 Barriers to OER and Different Variables

We also analysed whether there was a pattern of barriers to OER in the data set in terms of demographic variables, including gender, age, professional designation, discipline, highest qualification, teaching experience, nature of institution, and the respondents' OER use and OER contribution. These results are reported below.

### Gender

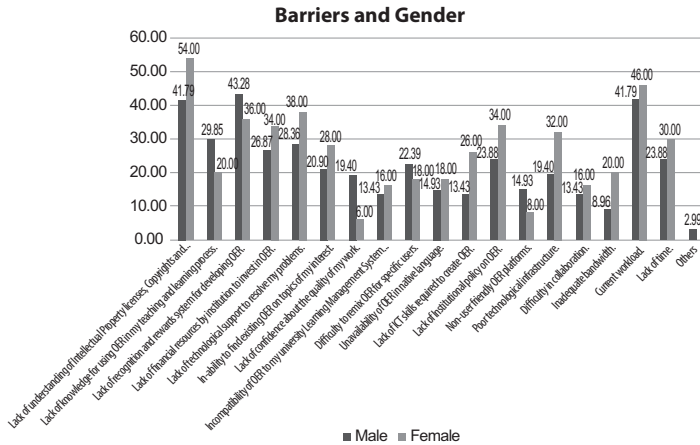


Figure 7.1: OER barriers and gender

Figure 7.1 shows the distribution of barriers identified by male ( $n = 67$ ) and female ( $n = 50$ ) respondents. It is interesting to note that for the male respondents, lack of recognition and reward was the number one barrier (43.28%), while for the female respondents, it was lack of knowledge of copyright and licensing issues (54%). Amongst the male respondents, both lack of knowledge of copyright and licensing and lack of time were the joint number two barriers, at 41.7% each, while for the female respondents, it was lack of time (46%). Was there a significant difference in barriers to OER between male and female respondents? The results of the chi-square revealed ( $\chi^2 (18, N = 117) = 17.46, p > .05$ ) that the distribution in the sample did not differ significantly between the genders.

### Age

When we analysed the responses according to the age groupings of the participants, we found some interesting results. Respondents younger than 35 ( $n = 60$ ) indicated knowledge of copyright and licensing to be the top barrier (58.33%), while they identified lack of recognition and reward (48.33%) and current workload (31.67%) as the second and third top barriers (Table 7.4). For the respondents in the 36–50 age group ( $n = 44$ ), technical and personal barriers were prominent, with 50% indicating bandwidth issues and 36.36% indicating lack of ICT skills. Respondents in the age group of 51 and above ( $n = 10$ ) indicated workload to be the biggest barrier (90%),

followed by lack of knowledge about using OER for teaching and learning (60%). Interestingly, personal barriers related to lack of confidence in one's own material, and technical barriers due to non-user-friendly platforms, were indicated by 50% of the respondents in this group. While older teachers are considered to be experienced in teaching, in this study they were not confident about sharing their written materials as OER. This could be due to the fact that the teachers in this sample have been heavily dependent on existing textbooks and have not written teaching and learning materials. Why this is so in the case of teachers aged 51 and above is important to explore further. However, considering the relatively small number of respondents, this finding cannot be generalised.

**Table 7.4:** Age and Barriers to OER

Barriers	<35 years	36-50 years	51 Years & above
Lack of understanding of Intellectual Property licenses, Copyrights and Creative Commons licenses.	58.33	11.36	30.00
Lack of knowledge for using OER in my teaching and learning process.	35.00	34.09	20.00
Lack of recognition and rewards system for developing OER.	48.33	31.82	60.00
Lack of financial resources by institution to invest in OER.	25.00	29.55	30.00
Lack of technological support to resolve my problems.	35.00	29.55	20.00
In-ability to find existing OER on topics of my interest.	21.67	13.64	-
Lack of confidence about the quality of my work.	16.67	15.91	50.00
Incompatibility of OER to my university Learning Management System (LMS).	8.33	22.73	20.00
Difficulty to remix OER for specific users.	20.00	20.45	-
Unavailability of OER in native language.	13.33	18.18	20.00
Lack of ICT skills required to create OER.	20.00	36.36	20.00
Lack of Institutional policy on OER.	25.00	4.55	20.00
Non-user friendly OER platforms.	11.67	31.82	50.00
Poor technical infrastructure.	20.00	18.18	30.00
Difficulty in collaboration.	6.67	11.36	50.00
Inadequate bandwidth.	15.00	50.00	20.00
Current workload.	31.67	27.27	90.00
Lack of time.	25.00	-	40.00
Other barriers	3.33	-	-

Multiple responses. Figures in percentages

## Professional Level

Table 7.5 shows the distribution of barriers to OER in relation to the professional level of the participants (assistant professor, associate professor, professor and other).

**Table 7.5:** Professional level and barriers to OER

Barriers	Asst Professor	Associate Professor	Professor	Others
Lack of understanding of Intellectual Property licenses, Copyrights and Creative Commons licenses.	52.11	23.53	42.86	50.00
Lack of knowledge for using OER in my teaching and learning process.	26.76	23.53	14.29	27.27
Lack of recognition and rewards system for developing OER.	49.30	29.41	14.29	27.27
Lack of financial resources by institution to invest in OER.	32.39	41.18	28.57	13.64
Lack of technological support to resolve my problems.	32.39	17.65	14.29	13.64
In-ability to find existing OER on topics of my interest.	25.35	17.65	14.29	27.27
Lack of confidence about the quality of my work.	18.31	5.88	0.00	9.09
Incompatibility of OER to my university Learning Management System (LMS).	11.27	35.29	28.57	4.55
Difficulty to remix OER for specific users.	21.13	17.65	28.57	18.18
Unavailability of OER in native language.	15.49	17.65	14.29	18.18
Lack of ICT skills required to create OER.	21.13	23.53	-	13.64
Lack of Institutional policy on OER.	23.94	17.65	42.86	45.45
Non-user friendly OER platforms.	9.86	11.76	28.57	13.64
Poor technical infrastructure.	19.72	35.29	42.86	27.27
Difficulty in collaboration.	12.68	23.53	-	18.18
Inadequate bandwidth.	9.86	11.76	42.86	18.18
Current workload.	33.80	47.06	42.86	72.73
Lack of time.	23.94	23.53	28.57	36.36
Other barriers	2.82	-	-	-

Multiple responses. Figures in percentages

The group “other” included media professionals and other academic professionals at the level of assistant professors. In the group of assistant professor (n = 71), which is the entry level in higher education, the top barrier is lack of knowledge of copyright and licensing (52.11%), followed by recognition and reward (49.3%) and current workload (33.8%). At the associate professor level (n = 17), the top barriers are current workload (47.06%), lack of funding at the institutional level for OER work (41.18%) and poor technical infrastructure in the institution (35.29%). At the professor level (n = 7), the top barriers are current workload, lack of institutional OER policy, inadequate bandwidth, poor technical infrastructure, and copyright and licensing issues, all at 42.86%. In the group of other (n = 22), which included mostly media and other academic staff, the biggest barrier is current workload (72.3%),

followed by copyright and licensing issues (50%). Lack of institutional OER policy (45.45%) is the third barrier for this group of respondents. The others group in the study were at the level of assistant professor; their role was to provide teaching support, so it is important to note that they indicated high levels of pressure from their current workload in comparison to assistant professors.

## Discipline

Table 7.6 provides an overview of the distribution of OER barriers in relation to the respondents' disciplines. Amongst the respondents in the humanities and social sciences (n = 59), about 50% consider their current workload a barrier to using and adapting OER. This is followed by lack of understanding of copyright and licensing (44.07%), which is also a top barrier for respondents in management and commerce (63.64%) and in engineering and technology (53.85%). For the management and commerce respondents, the next most important barrier is lack of institutional OER policy (45.45%).

**Table 7.6:** Discipline and barriers to OER

Barriers	Humanities and Social Sciences (including Education and Law)	Management and Commerce	Natural Sciences	Engineering and Technology	Medical and Health Science
Lack of understanding of Intellectual Property licenses, Copyrights and Creative Commons licenses.	44.07	63.64	35.00	53.85	-
Lack of knowledge for using OER in my teaching and learning process.	20.34	27.27	15.00	42.31	100.00
Lack of recognition and rewards system for developing OER.	40.68	18.18	25.00	57.69	-
Lack of financial resources by institution to invest in OER.	28.81	18.18	40.00	30.77	-
Lack of technological support to resolve my problems.	33.90	18.18	35.00	34.62	-

*Contd...*

Barriers	Humanities and Social Sciences (including Education and Law)	Management and Commerce	Natural Sciences	Engineering and Technology	Medical and Health Science
In-ability to find existing OER on topics of my interest.	20.34	36.36	20.00	30.77	-
Lack of confidence about the quality of my work.	16.95	9.09	20.00	3.85	-
Incompatibility of OER to my university Learning Management System (LMS).	11.86	9.09	15.00	19.23	100.00
Difficulty to remix OER for specific users.	23.73	-	10.00	26.92	-
Unavailability of OER in native language.	18.64	27.27	20.00	-	100.00
Lack of ICT skills required to create OER.	25.42	-	20.00	11.54	-
Lack of Institutional policy on OER.	33.90	45.45	30.00	7.69	-
Non-user friendly OER platforms.	10.17	-	20.00	15.38	-
Poor technical infrastructure.	32.20	36.36	20.00	7.69	-
Difficulty in collaboration.	16.95	9.09	15.00	11.54	-
Inadequate bandwidth.	18.64	9.09	10.00	7.69	-
Current workload.	49.15	36.36	50.00	26.92	100.00
Lack of time.	18.64	36.36	40.00	30.77	-
Other barriers	-	-	-	7.69	100.00

Multiple responses. Figures in percentages

## Highest Qualification

Table 7.7 shows that the majority of the respondents had PhDs (n = 64), followed by master's or bachelor's degree holders (n = 44) and a few MPhil degree holders (n = 9).

Amongst the master's/bachelor's degree holders, the responses are quite evenly distributed, all of them being below 25% except current workload (29.55%) and lack of understanding of copyright and licensing issues (29.55%). For the PhD holders, current workload (43.75%) is the top barrier, followed by lack of institutional financial resources for OER (35.94%). Other important barriers for them are lack of technical support (34.38%) and lack of recognition and reward (34.38%). Respondents with an MPhil also indicated licensing and copyright (66.67%) as the main barrier, followed by lack of recognition and reward (55.56%) and lack of confidence in their own work (55.56%).

**Table 7.7:** Highest qualification and barriers to OER

Barriers	Bachelor/ Masters	MPhil	PhD
Lack of understanding of Intellectual Property licenses, Copyrights and Creative Commons licenses.	29.55	66.67	42.19
Lack of knowledge for using OER in my teaching and learning process.	34.09	22.22	15.63
Lack of recognition and rewards system for developing OER.	38.64	55.56	34.38
Lack of financial resources by institution to invest in OER.	22.73	22.22	35.94
Lack of technological support to resolve my problems.	25.00	22.22	34.38
In-ability to find existing OER on topics of my interest.	20.45	11.11	25.00
Lack of confidence about the quality of my work.	4.55	55.56	14.06
Incompatibility of OER to my university Learning Management System (LMS).	11.36	-	17.19
Difficulty to remix OER for specific users.	15.91	33.33	20.31
Unavailability of OER in native language.	9.09	11.11	21.88
Lack of ICT skills required to create OER.	11.36	44.44	17.19
Lack of Institutional policy on OER.	20.45	33.33	29.69
Non-user friendly OER platforms.	9.09	-	15.63
Poor technical infrastructure.	15.91	44.44	28.13
Difficulty in collaboration.	2.27	22.22	20.31
Inadequate bandwidth.	9.09	22.22	14.06
Current workload.	29.55	33.33	43.75
Lack of time.	20.45	-	26.56
Other barriers	4.55	-	-

Multiple responses. Figures in percentages

### *Teaching Experience*

Table 7.8 shows the distribution of barriers to OER in terms of the respondents' years of teaching experience. Amongst teachers with zero to five years of experience

(n = 33), lack of technical support (21.21%) in the institution is a big barrier. It is also a relatively big barrier for respondents with teaching experience of six to 15 years (n = 48). However, for this group of respondents, the top priority is lack of understanding of copyright and licensing (50%), followed by lack of recognition and reward (45.83%). In the group with 16–25 years of experience (n = 24), the top barrier is workload (58.33%), followed by lack of institutional OER policy (41.67%) and lack of time (41.67%). In the group with 26–35 years of teaching experience (n = 10), the top barrier is current workload (70%).

### ***Type of Institution***

Table 7.9 depicts the distribution of barriers to OER according to the respondents' type of institution (face-to-face teaching: n = 59; distance teaching: n = 39; dual-mode teaching: n = 19). Across the different types of institutions, the top barrier is lack of understanding of copyright and licensing issues. However, the second highest barrier in distance education institutions (51.28%) and dual-mode institutions (42.11%) is the respondents' workload, while for respondents in face-to-face institutions, the second highest barrier is lack of recognition and reward (42.37%).

**Table 7.8:** Teaching Experience and Distribution of Barriers to OER

Barriers	0–5 Years	6–15 Years	16–25 Years	26–35 Years	More than 35 Years
Lack of understanding of intellectual property licences, copyright and Creative Commons licences.	12.12	50.00	37.50	30.00	0.00
Lack of knowledge about using OER in my teaching and learning processes.	12.12	33.33	8.33	10.00	100.00
Lack of recognition and rewards system for developing OER.	18.18	45.83	33.33	10.00	0.00
Lack of institutional financial resources to invest in OER.	12.12	25.00	37.50	30.00	0.00
Lack of technological support to resolve my problems.	21.21	31.25	20.83	10.00	50.00
Inability to find existing OER on topics of interest to me.	15.15	20.83	29.17	0.00	0.00
Lack of confidence about the quality of my work.	3.03	22.92	0.00	0.00	0.00
Incompatibility of OER with my university learning management system (LMS).	3.03	10.42	20.83	30.00	0.00
Difficulty with remixing OER for specific users.	6.06	16.67	25.00	20.00	0.00
Unavailability of OER in my native language.	6.06	16.67	20.83	10.00	0.00
Lack of ICT skills required to create OER.	9.09	12.50	16.67	0.00	50.00

*Contd...*

Barriers	0–5 Years	6–15 Years	16–25 Years	26–35 Years	More than 35 Years
Lack of institutional policy on OER.	3.03	27.08	41.67	30.00	0.00
Non-user-friendly OER platforms.	9.09	8.33	0.00	50.00	50.00
Poor technical infrastructure.	9.09	22.92	33.33	10.00	0.00
Difficulty in collaboration.	0.00	14.58	20.83	30.00	0.00
Inadequate bandwidth.	6.06	8.33	20.83	10.00	0.00
Current workload.	9.09	37.50	58.33	70.00	0.00
Lack of time.	18.18	14.58	41.67	40.00	0.00
Other barriers;	0.00	2.08	0.00	0.00	0.00

Multiple responses. Figures in percentages

**Table 7.9:** Nature of institution and distribution of barriers to OER

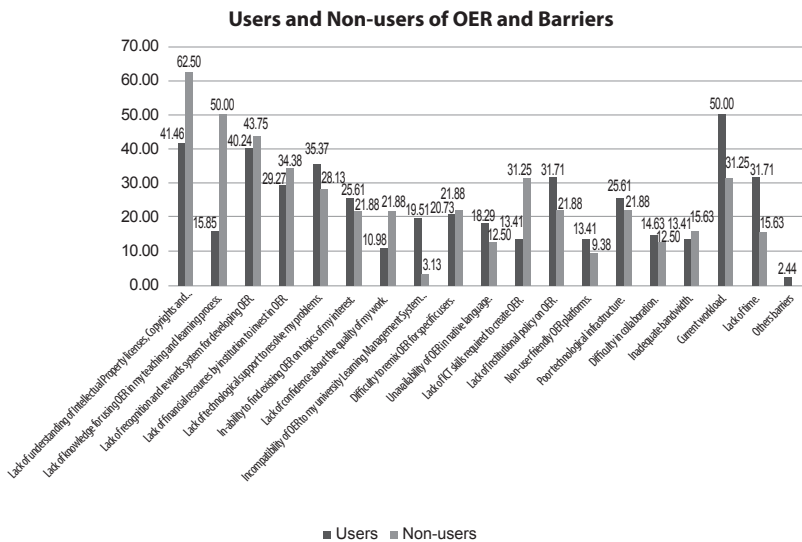
Barriers	Face-to-face teaching	Distance Education	Dual Mode
Lack of understanding of Intellectual Property licenses, Copyrights and Creative Commons licenses.	40.68	53.85	52.63
Lack of knowledge for using OER in my teaching and learning process.	20.34	30.77	31.58
Lack of recognition and rewards system for developing OER.	42.37	46.15	21.05
Lack of financial resources by institution to invest in OER.	40.68	17.95	21.05
Lack of technological support to resolve my problems.	37.29	23.08	36.84
In-ability to find existing OER on topics of my interest.	28.81	20.51	15.79
Lack of confidence about the quality of my work.	10.17	12.82	26.32
Incompatibility of OER to my university Learning Management System (LMS).	23.73	2.56	10.53
Difficulty to remix OER for specific users.	18.64	20.51	26.32
Unavailability of OER in native language.	10.17	17.95	31.58
Lack of ICT skills required to create OER.	15.25	15.38	36.84
Lack of Institutional policy on OER.	28.81	28.21	26.32
Non-user friendly OER platforms.	11.86	12.82	10.53
Poor technical infrastructure.	22.03	23.08	36.84
Difficulty in collaboration.	15.25	17.95	5.26
Inadequate bandwidth.	11.86	15.38	15.79
Current workload.	38.98	51.28	42.11
Lack of time.	32.20	25.64	10.53
Other barriers	3.39	-	-

Multiple responses. Figures in percentages



## OER Users

Figure 7.2 shows the distribution of responses regarding barriers to OER amongst users (n = 82) and non-users (n = 32) of OER. It is important to note that users found workload (50%) to be the top barrier, while non-users considered lack of understanding of copyright and licensing (62.5%) to be the top barrier. For non-users, the next highest barrier is lack of knowledge about using OER in teaching and learning (50%), followed by lack of recognition and reward (43.75%). For OER users, the second highest barrier is lack of understanding of copyright and licensing issues (41.46%), followed by lack of recognition and reward (40.24%). While in percentage terms we see some difference in the distribution, the chi-square test ( $\chi^2$  (18, N = 114) = 29.96,  $p > .05$ ) revealed no significant difference between barriers identified by users and non-users of OER.



**Figure 7.2:** OER users and non-users and barriers to OER

## OER Contributors

Figure 7.3 depicts the distribution of barriers according to OER contributors (n = 32) and non-contributors (n = 82). The top barrier according to contributors is current workload (65.63%), while for the non-contributors it is lack of understanding of copyright and licensing issues (57.32%). The next barrier for contributors is difficulty in remixing materials with different types of licences (31.25%). However, for non-contributors, the second highest barrier is lack of recognition and reward (43.9%), followed by lack of technological support in the institution (35.37%) and current workload (35.37%). The chi-square test revealed ( $\chi^2$  (18, N = 114) = 30.11,  $p < .05$ ) significant differences between what the contributors and non-contributors identified as barriers. It is interesting to note that for the non-users and non-contributors, workload is not a major barrier, while for the users and contributors, workload is a major barrier.

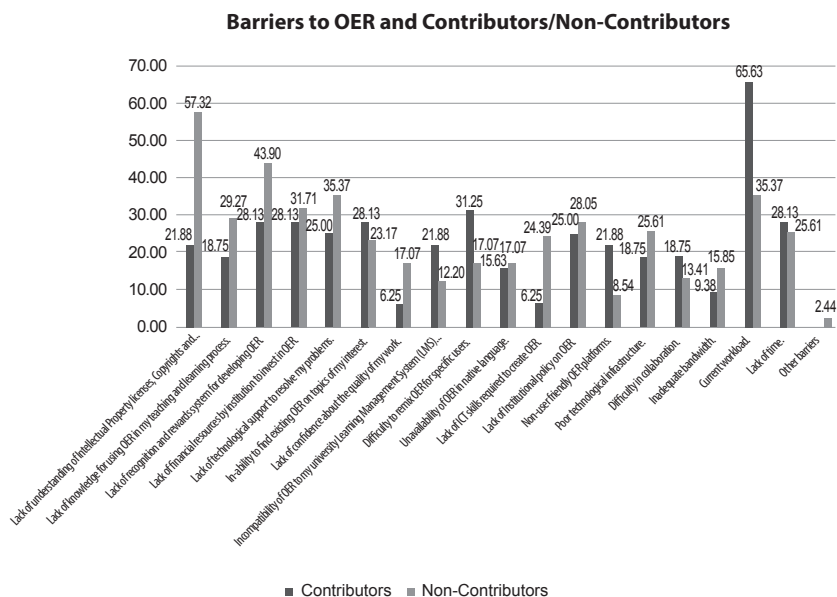


Figure 7.3: OER contributors and non-contributors and barriers to OER

## 7.4 Discussions

Overall, many respondents expressed that understanding licensing and copyright is the major barrier for them in using and adapting OER. Legal barriers are at the top of the list, and this finding is supported by quantitative data from the questionnaire as well as qualitative data from the workshop sessions. Mtebe and Raisamo (2014a) and Harishankar (2013) also showed that with respect to creating OER, Creative Commons licensing is a concern for some faculty members. Respondents also indicated that their current workload is high and they do not have enough time for OER work. Harishankar (2013) also stated that teachers are not able to work with OER due to existing work pressures, which is consistent with the present findings. Most other studies also indicate that teachers lack the time to find suitable materials (Clements & Pawlowski, 2012; Coughlan et al., 2013; Friesen, 2009; Hart et al., 2015; Harishankar, 2013; Hilton & Wiley, 2010; Mtebe & Raisamo, 2014b; Ossiannilsson & Creelman, 2012; Prasad & Usagawa, 2014; Prior, 2011; Rolfe, 2012; Tabata & Johnsrud, 2008). There are also institutional barriers, such as lack of technical support, lack of OER policy, and Internet bandwidth issues. Inadequate infrastructure in terms of labs, computers (shared or individual) and other required equipment (e.g., audio-video recording devices) have already been reported as barriers to creating, revising or remixing OER (Coughlan et al., 2013; Dhanarajan & Porter, 2013; Hart et al., 2015; Hylén, 2006; Mtebe & Raisamo, 2014a, 2014b). Lack of recognition and rewards for OER work were also cited by many as barriers, as in previous studies (Glennie et al., 2012a; Hilton & Wiley, 2010; Hylén, 2006; Tabata

& Johnsrud, 2008; Rolfe, 2012). Some also indicated lack of institutional funds to support OER work. Overall, the barriers are indicators of resistance to change and adaptation. Removal of these barriers will not automatically result in the use and adaptation of OER by teachers. However, their removal will create an enabling environment for OER uptake.

Thus, the barriers to using and contributing OER in the Indian higher education space need to be removed. Training and capacity building are required to help teachers understand OER, copyright and the licensing system. Developing appropriate policies for sharing educational materials, along with providing technical facilities within the institutions, would create the necessary enabling conditions to support teachers in using and adapting OER. Providing incentives in the form of recognition and rewards may also help teachers to adopt OER, although we have seen that most of the teachers are intrinsically motivated.

# Interacting Factors and Activity Theory Lens for OER

## 8.1 Relationships of Attitudes, Motivation and Quality Perceptions

After analysing attitudes, motivations and perceptions of OER quality, we tried to answer the question: Are there relationships amongst teachers' attitudes, motivations and perceptions of OER quality? We looked for correlations. As the data for the barriers were ranked, regression analysis with other variables was not possible.

The correlation coefficient values presented in Table 8.1 indicate the relationships between teachers' attitudes, their motivation to use and adapt OER, and their perceptions of OER quality, by considering pair-wise correlation coefficients. Only motivation and attitudes are moderately correlated ( $r = 0.45$ ). However, this is not significant at the 0.05 level. This could be interpreted to mean that respondents' attitudes towards OER, motivations for using and adapting OER, and perceptions of OER quality are independent of each other.

**Table 8.1:** Correlations amongst Attitudes, Motivations and Perceptions of Quality

		Attitude	Motivation	Quality
<b>Pearson Correlation</b>	Attitude	1.00		
	Motivation	.45	1.00	
	Quality	-.04	.000	1.00

We also conducted a multiple regression analysis to understand whether the mean of individual items of motivation and quality is related to the mean attitude towards OER. While there may not be relationships amongst attitudes, motivation and perceptions of quality, a multiple regression considering mean attitude to be the dependent variable could determine whether there are relationships amongst mean attitude, mean motivation and mean quality. Table 8.2 shows the model summary of the regression analysis, which explains only 20.5% of the variance in the dependent variable (attitude towards OER) and motivations to use and adapt OER as well as perception of OER quality.

**Table 8.2:** Model Summary for Regression Analysis 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.453a	.205	.191	.42125

a. Predictors: (Constant), Mean Quality, Mean Motivation

In Table 8.3, the analysis of variance (ANOVA), the F ratio is higher than the tabulated value at 2, 114 df for this model. This indicates a possible relation amongst some of the items in the predictor variables and the dependent variable.

**Table 8.3:** ANOVA for Regression Analysis 1

Model	Sum of Squares	df	Mean Square	F	Sig.
<b>Regression</b>	5.212	2	2.6	14.68	.000a
<b>1 Residual</b>	20.22	114	.177		
<b>Total</b>	25.44	116			

a. Predictors: Mean Quality, Mean Motivation

**Table 8.4:** Coefficients for Attitude towards OER (Regression Analysis 1)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.757	.344		10.912	.000		
1 Mean	.181	.034	.451	5.396	.000	1.00	1.00
Motivation							
Mean	-.037	.073	-.043	-.512	.610	1.00	1.00
Quality							

Column B in Table 8.4 shows the unstandardised regression coefficients for the regression equation. The regression equation may be constructed as:

$$\text{Mean attitude} = 3.757 + 0.181 \text{ Mean motivation} - 0.037 \text{ Mean quality}$$

The t values indicate that the regression coefficients of constant and mean motivation are significantly different from zero. However, the t value for mean quality is near zero. Therefore, the regression equation shows a relationship between attitude and motivation only. The variable inflation factor (VIF) is well below ten, showing that there is no collinearity.

Since the regression model explained only 20.5% of the variance and indicated relationships between attitude towards OER and motivation to use and adapt OER, we explored step-wise regression to identify items that could explain a higher percentage of mean attitude and predict a model. The model summary (Table 8.5) indicates that models 7, 8 and 9 are plausible, as they depict around 82.4% of the variance (R square). ANOVA (Table 8.6) for models 7, 8, and 9 measures whether or not the equation represents a set of regression coefficients that are statistically

significant from zero. The high F ratio indicates that the equations for models 7, 8 and 9 are statistically significant at less than the 0.05 level of significance.

**Table 8.5:** Model Summary for Regression Analysis 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.676 <sup>a</sup>	.457	.452	.33818
2	.774 <sup>b</sup>	.599	.591	.29204
3	.821 <sup>c</sup>	.674	.665	.26437
4	.849 <sup>d</sup>	.720	.709	.24638
5	.871 <sup>e</sup>	.759	.747	.22977
6	.884 <sup>f</sup>	.781	.768	.21996
7	.894 <sup>g</sup>	.800	.785	.21162
8	.904 <sup>h</sup>	.817	.801	.20349
9	.908 <sup>i</sup>	.824	.807	.20042

- a. Predictors: (Constant), Motivation 17
- b. Predictors: (Constant), Motivation 17, Motivation 8
- c. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13
- d. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16
- e. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19
- f. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1
- g. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1, Motivation 4
- h. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1, Motivation 4, Quality 4
- i. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1, Motivation 4, Quality 4, Motivation 5

**Table 8.6:** ANOVA for Regression Analysis 2

	Model	Sum of Squares	df	Mean Square	F	Sig.
7	Regression	17.505	7	2.501	55.843	.000 <sup>h</sup>
	Residual	4.389	98	.045		
	Total	21.894	105			
8	Regression	17.877	8	2.235	53.968	.000 <sup>i</sup>
	Residual	4.016	97	.041		
	Total	21.894	105			
9	Regression	18.037	9	2.004	49.892	.000 <sup>i</sup>
	Residual	3.856	96	.040		
	Total	21.894	105			

- h. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1, Motivation 4
- i. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1, Motivation 4, Quality 4
- j. Predictors: (Constant), Motivation 17, Motivation 8, Motivation 13, Motivation 16, Motivation 19, Quality 1, Motivation 4, Quality 4, Motivation 5

**Table 8.7:** Coefficients for Attitude towards OER (Model 9)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.696	.183		3.798	.000		
Motivation 17	.128	.035	.205	3.648	.000	.582	1.717
Motivation 8	.119	.035	.173	3.403	.001	.712	1.405
Motivation 13	.081	.026	.157	3.117	.002	.722	1.385
9 Motivation 16	.113	.035	.171	3.208	.002	.646	1.548
Motivation 19	.097	.027	.175	3.604	.000	.779	1.284
Quality 1	.104	.031	.174	3.351	.001	.677	1.476
Motivation 4	.073	.026	.152	2.831	.006	.636	1.572
Quality 4	.058	.018	.145	3.111	.002	.842	1.188
Motivation 5	.083	.041	.111	1.997	.049	.589	1.697

Table 8.7 indicates that the following motivation items and quality items could possibly predict 82.4% of the variance in the respondents' mean attitude towards OER.

#### **Motivation Items:**

- OER provides us with opportunities for establishing new partnerships. (Motivation 17)
- OER gives me opportunities to learn new things. (Motivation 8)
- Involvement in OER will bring me recognition. (Motivation 13)
- I like receiving comments and feedback from experts and senior colleagues on OER I have created. (Motivation 16)
- I know about my intellectual property rights under Creative Commons licences. (Motivation 19)
- Through OER, I can reach disadvantaged communities. (Motivation 4)
- OER will help developing countries increase access to education. (Motivation 5)

#### **Quality Items:**

- OER saves teachers' time. (Quality 4)
- I do not need permission to use OER. (Quality 5)

Thus, we can identify some relationships amongst the mean attitude towards OER and respondents' motivations for using and adapting OER as well as their perceptions of OER quality. Interestingly, we also discovered that certain collaboration-related and individual motivations are stronger than altruistic motivations. This is an important finding, as during interviews, most of the respondents indicated altruistic reasons for using and adapting OER. However, the statistical data indicate a tendency towards the importance of other motivations, such as personal benefits — learning, recognition and collaboration. Similarly, the respondents were critical about OER quality during

interviews. However, this analysis shows two non-important quality indicators to have some influence on attitudes: that OER can save time and do not require permission are possible predictors of attitudes. These are actually characteristics of OER rather than indicators of OER quality. We included these items in the questionnaire to check how the respondents perceived quality. The study indicates that respondents considered time saving and open licences as quality issues, and that they had positive attitudes towards OER.

## 8.2 Activity Theory Lens for OER

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We used the Activity Theory framework to analyse the in-depth interviews of selected workshop participants as well as the qualitative data collected during the workshops. These transcripts were analysed using Dedoose. It is important to note that the purpose of using Activity Theory is to identify contradictions that are inherent in the operation of systems, and thereby identify how to increase teachers' use and adaptation of OER. When a new activity such as OER is introduced into any existing system that predominantly observes the standard copyright regime, many contradictions and alignments will arise that can be interpreted within the triads of Activity Theory. According to Engeström (2001), primary contradictions may result in aggravated secondary contradictions as new elements collide with old practices. Contradictions lead to clarifications and alignments of an organisation's goals with new developments. Engeström and Sanniono (2010) stated that contradictions are the driving forces in transformation.

The *subjects* in this study were largely OER users and OER non-contributors. They had varying degrees of awareness of OER and copyright issues in general. The *tools* discussed were largely related to technology for OER and to the institutional infrastructure for finding and creating OER. The *object* node is related to why the subjects had either used OER or were planning to use OER. What were the concerns and goals that would be addressed and reached through OER? Rules comprise the policies as well as the explicit and implicit practices in organisations that may facilitate or hinder the use and adaptation of OER. *Community* and *division of labour* encompass, respectively, the influences of peers, communities and institutions to enable OER uptake, and the hindrances related to workload, time concerns and labour requirements. Overall, the Activity Theory nodes and their mediation provide a platform on which to analyse the potential of uptake of OER in the context of Indian higher education institutions.

Using the Activity Theory nodes, we created several triads to analyse the interview transcripts. These are discussed below.

### 8.2.1 Subjects–Tools–Objects

Almost all the teachers had access to a computer and the Internet at home as well as at the institution. However, Internet access was problematic, and about 40% of the interview participants paid fees. All had Internet access through mobile and/or Wi-Fi



systems and used either a desktop or a laptop. About 50% had used OER, and none of them had contributed OER. Their reasons for sharing ranged widely. For some, the objective was altruistic — from helping others access knowledge to believing “sharing is good for the country.” For others, sharing was a personal choice to gain recognition and improve their professional image. A sample of their responses follows:

[O]pen educational resources will help particularly our country, because we have a large population and many poor people are there who are not directly having access to education.

[I]n a globalised world, a teacher should not use information or data which is obsolete or out-dated. I use OER to update my teaching.

It saves time; using OER, I can cover the whole syllabus on time.

[M]y objective of using OER is to be different... to get recognition as an innovative teacher who makes extra efforts.

[The] costs of textbooks, especially in engineering subjects, are high, and using OER helps reduce costs.

There were no inherent contradictions in this triad, although teachers’ access to technology needed improvement, especially to reduce their personal investment in Internet costs.

## 8.2.2 Tools–Rules–Division of Labour

In terms of analysing this triad, it is important to note that none of the institutions where we conducted the study had an OER policy, so it was obvious that the interviewees would automatically indicate lack of policy as a barrier to contributing OER. They used OER because doing so saved time, and they could find resources easily. The absence of institutional support for creating learning materials was a problem for many. However, one participant indicated:

Our university has a media centre that helps [with the] production of multimedia materials... but these are not openly available.

In terms of the difficulty in creating OER, one participant summarised the problem as lack of time:

[S]haring is easy but creation is difficult. Sharing is easy and it does not take much time, but creating is something difficult because we are having so many assignments and we have to do so many jobs apart from our regular teaching jobs... so in that process we don’t have much time to prepare or to study different things and then create and contribute.

Some of the participants felt lack of knowledge about OER and licensing was a problem when it came to using OER.

[T]here is apprehension on the part of people to use OER because of various factors, like whether they would be infringing on the copyright laws/rules and then not having proper notion about Creative Commons licensing... people resist to change.

### 8.2.3 Subjects–Rules–Community

The subjects in the study came from different types of institutions, and that played a role in the topics of discussion. One participant in a conventional face-to-face university indicated that when the idea of the OER workshop was initiated, there was overall resistance in the community, because people assumed it would be about distance education:

Awareness in the university is a big problem... before the workshop, 60 to 70 per cent of my colleagues were not aware of OER... The kind of inhibitions and the kind of reservations and the kind of hesitations and doubts we raised when our vice-chancellor informed us about the workshop are indications to that... [W]e thought he was taking us to distance education.

Another participant indicated that not many teachers in her university were aware of OER, which is a big problem for OER creation.

[M]ostly no one is aware of OER... many use the Web facilities [and the] Internet only to check their emails. They are not aware of OER. There are two teachers in ET [educational technology], but they are also not aware.

While they believed that OER in their university and/or department had problems, in the broader disciplinary community, they thought that OER was not a problem as such, although awareness might still be an issue. Most of the interviewees also cited as problematic an absence of rules to support OER and ICT provision. However, some also indicted that their university had support mechanisms for ICT use.

### 8.2.4 Subject–Community–Objects

In this triad, we largely find issues related to how the community looks at institutional goals and the objectives of using OER. Here again, the lack of awareness played an important role. One participant said that teachers in his department understood the value of access to quality materials and that if awareness were improved, greater use of OER might result.

[E]veryone here is educated, and they know the problems of lack of quality materials... but then they are not aware of OER and can't find the OER... This workshop has actually opened our minds. I am sure this will make a difference, and our colleagues as well as we as takers are really going to bring in a change.

### 8.2.5 Objects–Community–Division of Labour

One of the objectives outlined by many of the participants was collaboration. They believed greater awareness about the advantages of OER could lead to greater collaboration in their communities to develop OER, especially in the broader disciplinary communities beyond institutional boundaries.

Collaboration is important because today's teachers are having lot of knowledge in different fields, and when I do something individually, I don't think it can actually

refer to all those necessary or connected issues which maybe one of my colleagues from another department might be able to let me know. In that sense I think institutional collaboration, departmental collaboration and interdepartmental collaboration, all are necessary in order to create very effective OER.

A participant at KKHSOU indicated that she can collaborate with another faculty member from Guwahati University to create OER:

[W]e can exchange our knowledge, we can exchange our views... collaborate in teams with Guwahati university faculty so that educational material prepared is not an individual work.

### 8.2.6 Subject–Rules–Objects

The respondents in the interviews were users of OER but had never contributed OER. The major problem they identified with respect to contribution was the absence of policy for using and contributing OER. While they used OER for personal interest and for altruistic reasons, they believed that having rules supporting OER in their institutions would encourage them to create OER.

One interview participant indicated:

At present there is no prescribed rule as such, but if UGC [the University Grants Commission] can consider giving API scores to OER work... at least innovative material... that would encourage many to create OER.

A teacher in the dual-mode institution said that policy need to be clearly spelled out as they develop materials for distribution to learners.

If we intend to use OER for our SLM [self-learning materials] in [the] future, then yes, as a teacher and as a co-ordinator of a particular course/programme, I would be looking towards my institutions for guidelines... It is not just my responsibility but also the responsibility of the institution.

### 8.2.7 Subject–Rules–Division of Labour

While the subjects believed that OER saves time, the lack of rules in their institutions was a major barrier to using and adapting OER, as there was no support for the staff and no rules about collaborating with others within or outside the organisation. Some of the participants believed OER would help learners receive materials anywhere, especially learners in remote areas, where for various reasons conventional materials either arrive late or do not arrive at all. Such teachers want institutional policies so that OER are available via a platform.

I am working in distance education, so I deal with huge number of learners... [and] some of them may not receive materials on time... I just want to share my materials with my learners, but there is a lack of provision for sharing materials. I am motivated to know how to reach the unreached, as there are deprived learners who can access knowledge easily through the Internet if we can provide a platform.

On the other hand, another participant indicated that learners in remote areas may not have access to the Internet to download OER:

Technological barrier[s] may be there for people to access OER developed by my university... So, [the] university needs to make provisions to provide access to technology.

There are contradictions in these systems. While there has been an urge to share materials using digital technologies, teachers are also concerned about the lack of access in remote areas and believe that universities must do something to rectify this issue.

### **8.2.8 Subject–Objects–Division of Labour**

While the subjects of the interviews were largely users of OER, they found searching for materials time-consuming, and their different roles in the university left them little time to undertake OER work. This was a major concern for most of the respondents.

[O]urs is a conventional [face-to-face teaching] university. We have to teach four subjects, and we are only three teachers in our department. I teach four or five subjects every semester... I am also having additional responsibility as a co-ordinator for the scholarship section, so the only time that I can spend to find relevant OER is at home.

Another participant indicated:

The heavy workload of the faculty members is a barrier... I deal with more than 4,000–5,000 learners in education, so taking counselling classes, assigning homework then conducting different types of activities for the students is a huge task for a single teacher.

One participant from a face-to-face teaching institution stated:

Reduction of workload... every week some two to three hours workload reduction for OER work would encourage teachers to create OER.

### **8.2.9 Tools–Rules–Community**

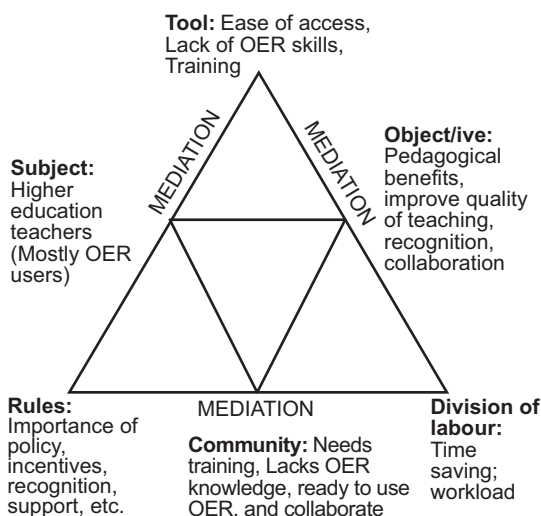
The respondents were more familiar with office tools, email and web searching, but they had little knowledge of how to find OER or the tools that would help them find and use OER. As already noted, the lack of policy and rules about using OER is a major challenge in all the institutions covered in this study. Some of the respondents believed that the teaching community needed to be trained in the appropriate use of technologies.

Lack of technical skills to use OER is a major problem in my department — or for that matter, in my university... As teachers are busy people, they don't have time to search for each and every thing. They need to be trained to make effective use of their time.

As of now, there is no such platform and there is no such infrastructure, and even our website is very pathetic, and the manpower in terms of technology is not that good, and the university is running on support basis that's what hiring [from outside and day to day basis]... The technical people are not much competent, and we ourselves also are not much competent in terms of the advanced technology available that is to be used and applied in this kind of exercise [i.e., OER]. Training would certainly help as well having regular staff who can help teachers to find resources.

A summary of the above discussions is depicted in Figure 8.1. Analysis of this figure reveals several interconnections between respondents' motivations to use and adapt OER and the barriers to them doing so. Most of the respondents (*subjects*) were only users of OER. The tools revealed a broad view that describes the teachers' level of understanding about available tools and techniques for using, creating and sharing OER. Most of the teachers had a basic understanding of Internet and technology usage. They were familiar with MS word, PowerPoint presentations, simple Google searches, and different social networking sites. They accessed the Internet using facilities provided by their institution and also on personal laptops and mobiles at home. Few of them used their own tablet or iPad to access and search the Internet; instead, most used either Wi-Fi, broadband or LAN. Hence, the majority of respondents believed they had easy access to the Internet. However, they had little knowledge of how to find OER. The *objectives* node depicts their motivations for using and adapting OER. The respondents wished to improve the quality of their teaching, gain recognition and collaborate with others. They also wanted to help students reduce the cost of learning materials by finding relevant OER for them. Although their motivations were largely altruistic and intrinsic, we also found that they used OER for personal benefit and due to extrinsic motivations, such as recognition and rewards. Teachers searched for quality material that was appropriate for their students to use and share. Some also indicated that remaining up-to-date was a reason to use OER.

*Rules* related to licensing knowledge or legal awareness revealed that the respondents had a very low level of knowledge about the Creative Commons licensing system and copyright law. In addition, the lack of institutional policies and rules to promote the use of OER was repeatedly cited as a major barrier to using and adopting OER. In terms of *community*, the respondents were concerned about the lack of awareness in their community about how to take full advantage of OER. There were also contradictions in their thinking about using OER to reach the learners in remote areas. Most agreed that teachers in their department would welcome OER, as they recognised the difficulties faced in accessing OER. The use of OER was not related to any specific discipline, as anyone can prepare materials in any subject. Some respondents believed that disciplinary communities can improve the quality of OER, if they are engaged. Another node, *division of labour*, indicates that respondents faced excessive workload, resulting in a lack of time to even find relevant OER and use them. This is important from the perspective of adaptation, which requires more time than just use.



**Figure 8.1:** OER use and contribution in India using the Activity Theory lens

### 8.3 Discussions

The relationships between tools, objects, community, rules and division of labour will collaboratively influence the subjects who use and adapt OER. Thus, the Activity Theory nodes provide a way to analyse the motivation and barrier factors that will help with OER uptake in India. Most of the teachers were concerned about the object/ives node, as they searched for some academic value in using OER. However, the major concern in this sample was lack of appropriate institutional policies about using and contributing OER. In the absence of such policies, most of the nodes in the Activity Theory triads are affected. Many also sought governmental policies to help their institutions use OER. This may take a long time to happen. Another important issue is lack of awareness of OER, which is important from the perspective of community, building a peer group and lobbying for OER policy. In the absence of OER awareness, it is again going to be difficult to develop institutional OER policies. Based on this analysis, if more OER activities are to be promoted in Indian higher education, it is important to focus energy on policy development at the institutional, provincial and national levels. Sustained advocacy and awareness campaigns would help build peer groups who would advocate for OER. Training on OER should also be part of the strategy in institutions. A study by Gaba and Mishra (2015) indicated that OER training is needed immediately, due to the deficient skills of teachers in Asia's distance education institutions. There is also a need to provide adequate time for teachers to find and adapt OER. The respondents had heavy workloads and needed release time to undertake OER activities. As noted, the respondents in the interviews were OER users but had not contributed OER. This may also have affected the study's findings. However, due to the lack of OER policy in general, the findings are applicable for both user and non-user groups.

# Conclusions and Recommendations

## 9.1 Major Findings

We set out to explore why some teachers share and others do not. To solve this puzzle, we worked on the premise that teachers' attitudes and motivations towards OER, as well as their perceptions of OER quality and barriers to OER, could together influence their use and adaptation of these resources. The specific questions to be answered were:

- Q1. How are teachers' attitudes towards OER situated in the context of teaching and learning?*
- Q2. Is there any difference in attitudes towards OER amongst teachers according to different demographic variables?*
- Q3. What are teachers' motivations for using OER and sharing their work as OER?*
- Q4. Amongst different groups of teachers (based on demographic variables), is there any difference in motivation to use OER?*
- Q5. How do teachers perceive OER quality?*
- Q6. What barriers to using OER do teachers perceive?*
- Q7. With respect to using and adapting OER, are there relationships amongst teachers' attitudes, motivations and perceptions of quality?*

Here, we discuss these questions in the light of this study's findings.

**Question 1:** *How are teachers' attitudes towards OER situated in the context of teaching and learning?*

**Question 2:** *Is there any difference in attitudes towards OER amongst teachers according to different demographic variables?*

The study revealed that overall, teachers had positive attitudes towards OER, and their attitudes did not differ significantly across demographic variables. However, their attitude towards sharing was stronger than towards adapting materials developed by others. Most of the respondents would share for the pleasure of sharing and to disseminate their ideas to others. They thought sharing would increase their sphere of influence and their network, leading to recognition at a global level. Sharing

would thereby help them be part of a larger community and provide opportunities for improving their professional standing and their individual and institutional reputations. They also felt that sharing is a responsibility for teachers, and they felt happy to share their work and receive feedback from others. They also believed that such behaviour would encourage others to share. The respondents were not as strongly positive towards adaptation of OER. This was probably due to the sample, most of whom were users and had never contributed OER. It is also possible that these teachers wanted to share their expertise but did not want to adapt materials developed by others for other reasons, or due to the “not-invented-here” syndrome. However, they believed that knowledge of and competency in OER, understanding intellectual property rights and Creative Commons licensing, and proficiency in ICT skills would help with the adaptation of OER that would fulfil the academic requirements of their learners.

***Question 3: What are teachers’ motivations for using OER and sharing their work as OER?***

***Question 4: Amongst different groups of teachers (based on demographic variables), is there any difference in motivation to use OER?***

Teachers in the study were highly motivated to share OER once they had an understanding of these resources. Largely, they were motivated to use and share for altruistic reasons, including their strong positive attitudes towards sharing. This was followed by motivations based on the learning opportunities offered by OER, and the possibility of saving money and time. They also identified collaboration with others as a motive, along with opportunities for improving self-confidence, recognition and professional image. The results of the study show that these teachers were more motivated by intrinsic factors than by extrinsic factors, which aligns with their attitudes about sharing. However, the motivations were not significantly different across different groups of variables, except for age and highest qualification. We found that younger teachers were more motivated than older teachers, and PhD holders were more motivated than those holding simply a master’s degree.

***Question 5: How do teachers perceive OER quality?***

Quality was a major concern for the respondents. They believed the appropriateness of the resources to be a key criteria for quality. OER should be fit for purpose, otherwise they will require adaptation to local contexts. The open licensing that is inherent to OER could help with localisation, thereby lowering costs and saving time. Our key findings in terms of quality are:

- Respondents used their own criteria of appropriateness to measure OER quality, which is in tune with the philosophy of openness.
- The trustworthiness of OER sources was important for the respondents. The reputation of the source was also a matter to note when deciding about quality.
- To be considered quality materials, OER should support the pedagogical needs of the teaching and learning processes.



- An open licence is itself an indicator of quality, as it provides the opportunity for continuous improvement of the resource. However, only some types of open licence fall in this group.
- Respondents also agreed that OER need to be localised and adapted to specific contexts to be fit for purpose.
- OER should undergo the rigour of peer review to be considered quality materials.
- Quality assurance of OER should be the responsibility of those who prepare the materials, and institutions should create mechanisms to assure quality.

Respondents' perceptions of OER quality were not significantly different across different demographic variables, except for OER contributors and non-contributors. We found that non-contributors were more concerned about quality than contributors, although both groups largely agreed on quality concerns. This could be due to the fact that the contributors (i) had a better understanding of the challenges and opportunities than those who had yet to contribute, (ii) were critically evaluating OER before adapting them and (iii) accepted that OER could improve the quality of teaching and learning.

***Question 6: What barriers to using OER do teachers perceive?***

Positive attitude and strong motivation to use and adapt OER are not sufficient. If barriers to using and adapting OER are not removed or at least addressed, the uptake of OER in India will not accelerate. The top barrier identified by the teachers in this study was lack of understanding about licensing and copyright issues. This was followed by their current workload, which restricts the time they can spend on OER work. Most teachers considered OER additional work, as generating and/or adapting OER presently is not integrated into their teaching and learning practices, so they believed that engaging in these activities would require additional time that they do not have. Other barriers include lack of technical support, lack of OER policy, and poor Internet bandwidth at their institutions. Lack of recognition and rewards for OER work were also cited by many as barriers. This aligns with our findings about motivation and attitudes, although the respondents had positive attitudes and were intrinsically motivated to use and adapt OER. Barriers are indicators of resistance to changing and adapting. Removal or reduction of these important barriers will create an enabling environment for the uptake of OER in India.

***Question 7: With respect to using and adapting OER, are there relationships amongst teachers' attitudes, motivations and perceptions of quality?***

The study results do not indicate overall correlations amongst teachers' attitudes, motivations and perceptions of OER quality. However, multiple regression analysis revealed plausible correlations amongst certain motivation items and quality items. The regression model predicts 82.4% of variance in the means attitude towards OER due to several motivation items, including opportunities for partnership, affordances to learn, recognition, receiving feedback, knowledge of licensing and copyright, and reaching the unreached in developing countries. In addition, two quality items were

found to be related to mean attitudes: the openness of OER and the possibility of saving time.

Regression analysis additionally highlighted the importance of personal motivations, such as learning, recognition and collaboration. The respondents also noted two inherent characteristics of OER as quality indicators that could predict teachers' attitudes towards OER. This is an important finding from the perspective of looking at educational resources. If an educational resource is released with an open licence, it can be construed as quality material and there is the opportunity to improve the quality of the resource.

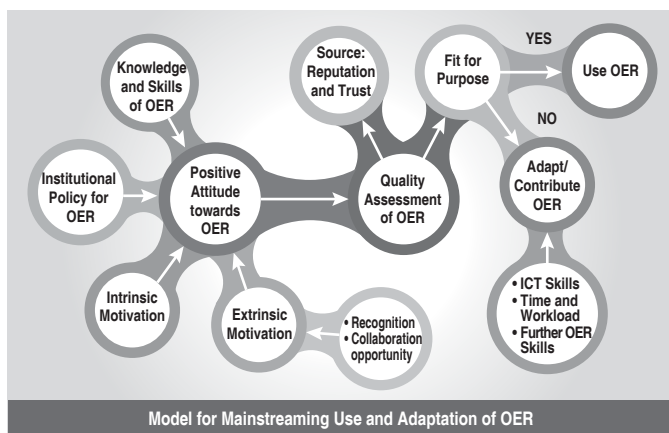
## 9.2 OER and Higher Education Teachers in India

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Based on the findings of the study, we can paint a picture of typical higher education teachers in India. They have a positive attitude towards OER and are also highly motivated to use and adapt OER. They lack knowledge of and skills in creating/using/adapting OER, as well as understanding of copyright and licensing; further, the lack of institutional policy is a barrier for them. While they are intrinsically motivated, they also think that receiving recognition for OER work would help them engage in it. They evaluate the quality of available OER based on whether the resources come from trustworthy sources and are appropriate for use. With more ICT skills and OER knowledge, they probably would further adapt resources for localised needs when the OER were not fit for purpose. We also found that typical Indian higher education teachers believe OER could improve pedagogical practices and quality of learning. Working in the field of OER would help them gain recognition and increase their scope for collaborating with other experts. They also believe that the technologies used for OER are simple and easy to use, but they presently do not have sufficient ICT skills to do so. Their community lacks OER skills and needs training, and their institution should have appropriate policies and clarity regarding support and incentives for OER work. Generally, they are users of OER, but they would like to contribute, provided their current workload is reduced.

Based on the findings of the study, we propose a simple model for promoting the use and adaptation of OER in India (Fig. 9.1).

Higher education teachers in India largely have positive attitudes towards OER and have been using OER knowingly or unknowingly, although adaptation of OER is very limited amongst teachers. Non-contributors are more concerned about the quality of OER. They are also motivated to use and adapt OER for the sake of sharing and believe that sharing should be expected of teachers. Considering that their current workload is a barrier to them devoting time to OER creation, they suggest that institutions provide incentives for OER work, in the form of recognition, reward and promotion points (in API scores). While we see that awareness about OER is not a factor in teachers' attitudes, our findings about motivations and barriers indicate that knowledge and understanding of OER, copyright and open licences are important to promote OER in India. Mtebe and Raisamo (2014a) as well as Harishankar (2013)



**Figure 9.1:** Model for promoting OER in Indian higher education

also showed that faculty members need knowledge of OER and Creative Common licences to create learning objects. Many studies have found that workload is a barrier to OER-related activities (Clements & Pawlowski, 2012; Coughlan et al., 2013; Friesen, 2009; Harishankar, 2013; Hart et al., 2015; Hilton & Wiley, 2010; Mtebe & Raisamo, 2014b; Ossiannilsson & Creelman, 2012; Prasad & Usagawa, 2014; Prior, 2011; Rolfe, 2012; Tabata & Johnsrud, 2008). While teachers are intrinsically motivated, they also need external motivation to contribute and share. Institutional policy is a major barrier in this respect. A clear OER policy framework is required to remove all doubts, among academics and administrators, pertaining to the use of OER. Davis et al. (2010) and Rolfe (2012) also found that a lack of policy raises issues such as ownership rights. The absence of institutional support in terms of any kind of appraisal, reward and recognition has been noted by the research of Glennie et al. (2012) and Tabata and Johnsrud (2008), who identified that this deficiency inhibits faculty members from using OER and from actively contributing to institutional OER repositories. Creating opportunities for collaboration with other institutions could lead to increased uptake of OER. The collaborative creation of resources and peer feedback may encourage teachers to work for OER promotion, as a recent study by Schreurs et al. (2014) found. Teachers also believe that for OER to be of good quality, the source should be trustworthy and the content appropriate for the purpose. However, they believe in deciding on appropriateness according to specific contexts so as to promote a learner-centred approach.

Appropriateness as a measure of quality of educational materials has been identified by Dhanarajan and Timmers (1992), Wild (2012) and Brent et al. (2012). Clements and Pawlowski (2012) reported that quality is a process outcome of a well-regarded institution. Teachers in the present study also indicated that “openness” in itself is a quality and that OER “save time,” which can also be considered factors in promoting quality.

We also found congruence between the findings from the questionnaire data, interviews and data collected during the face-to-face workshops. Teachers use OER

to help learners, including by reducing students' costs. Their main purpose for using OER is to improve both student learning and their personal reputation as innovative teachers. However, institutional rules and policies do not clearly encourage OER use. Teachers' ICT and OER skills also need further sharpening.

To promote the uptake of OER in Indian higher education institutions, a comprehensive strategy at the institutional level is needed. At the national level, the Ministry of Human Resources Development (MHRD) has adopted an open licensing policy<sup>10</sup> for its flagship project "National Mission on Education through ICT" (NME-ICT<sup>11</sup>). However, this being a project policy only, it will not have an impact in terms of institutionalising OER in Indian universities. To date, only three universities have OER policies, yet there still are no visible OER activities in these institutions, due to the policies' lack of clarity. Hence, having an appropriate policy is important but not sufficient. To make OER mainstream in Indian higher education, it is important to develop action plans with adequate funding support. In the next section, we present some recommendations for promoting the uptake of OER in India.

### 9.3 Recommendations

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One of the major objectives of this research was to understand why some teachers share and others do not. We gained a good understanding of this through the research. We know that teachers share largely due to their intrinsic motivation and because they believe sharing is a behaviour to be expected of teachers. However, they also indicated that recognition of their work would help motivate them to use and adapt OER. We found that adaptation of OER was the least common behaviour, largely due to a lack of institutional policy, plus teachers' workload and their consequent lack of time. Since higher education teachers in India are intrinsically motivated and have a positive attitude towards OER, it may be useful to harness these attributes so as to enable the large-scale uptake of OER in Indian higher education institutions. There is a strong need to create an enabling environment for OER in Indian universities. Teachers and educational leaders have very little awareness about the potentials of OER. We believe that Indian teachers would use and adapt OER if they had clarity about the relevant roles, responsibilities, processes, support and purposes, as well as how these align with their institution's mission and vision. Teachers are also concerned about the quality of OER and have indicated that they would like to see appropriateness and trust as important criteria for assessing OER quality. However, it is important to note that quality should be an institutional concern as well, because it contributes to building a university's reputation. Teachers in the study also indicated that their ICT and OER skill levels, as well as their current workloads, are barriers to them using and adapting OER.

On the basis of this study's findings, we proffer a set of recommendations to promote the use and adaptation of OER in the Indian higher education system.

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<sup>10</sup> [http://www.sakshat.ac.in/Document/OER\\_Policy.pdf](http://www.sakshat.ac.in/Document/OER_Policy.pdf)

<sup>11</sup> <http://www.sakshat.ac.in/>

### ***Recommendation 1: Advocacy and Awareness***

Make advocacy for and awareness of OER a top priority, with a particular focus on teachers and senior administrators.

### ***Recommendation 2: Adopt Policies***

Develop and implement institutional OER policies to foster the use of OER and facilitate OER projects by teachers.

### ***Recommendation 3: Provide Incentives and Release Time***

Provide teachers with incentives to engage in OER work, in the form of awards and/or recognition that counts towards promotion; in doing so, give OER work the same weight as research papers).

### ***Recommendation 4: Create QA Mechanism***

Create mechanisms for assuring OER quality by adapting the available quality frameworks.

### ***Recommendation 5: Continuous Professional Development***

Provide teachers with continuous professional development opportunities by regularly organising workshops and training sessions to enhance their ICT and OER skills.

## **9.4 Epilogue**

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During our research, we saw an overwhelmingly positive response to OER from teachers across institutions. We received several queries, and there was little or no resistance to the idea of sharing, especially when public funds are used. The principal investigator did note opposition to OER from the perspectives of innovation and the protection of intellectual property rights. These concerns normally came from senior people with science and engineering backgrounds, who tend to think in terms of patents and the monetisation of innovations. However, there is a wave of enthusiasm for OER amongst teachers, and these practitioners are looking for advice and support in their institutions. Access to knowledge resources and technology has broadened teachers' perspectives, although they remain concerned about quality and to some extent have the “not-invented-here” syndrome when it comes to adapting resources prepared by others. If the findings of this study can be implemented, OER uptake in India will grow much more quickly in the country's 700+ universities.

While we are confident about the findings and their implications, due to the rigour of the study's methodology as well as the triangulation of data from the questionnaire, interviews and workshop interactions, we feel that this area still presents several opportunities for further exploration and experimental research to establish causal relationships. The ATOER scale developed for measuring attitude towards OER is a significant output of this study. While it has satisfactory reliability and validity measures, it may be worthwhile to use the scale to replicate and test the two key aspects of attitudes towards OER — i.e., the sharing and adaptation of OER.

In addition, we understand that the sample size is too small to be broadly applicable in a country with a large population of teachers in over 700 universities. Our results can only be treated as indicative of these teachers' current attitudes and motivations, and their perceptions of OER quality and barriers. The study could be replicated in different institutions to understand the psychological determinants of the dominant players in the creation and use of OER. In fact, the principal investigator has started using the tools developed to collect data from institutions before undertaking policy developments to support OER. Institutions can devise better mechanisms to address barriers and to focus on motivations and issues of quality once they know what their teachers think about OER. Appropriate policies, advocacy and training strategies can be designed based on data. The next important step is taking the OER movement forward. It is important to foster a community of practice (CoP) of higher education teachers interested in OER, who can collaborate and develop courses. While there has been huge investment in content development through the NME-ICT projects, a CoP is vital to revise and update these resources as part of teachers' ongoing work, not least because they cannot always rely upon funding from the central government.

This research has been a journey of knowledge and exploration during which we came to know several teachers whom we would never otherwise have met. It also gave us the opportunity to understand the socio-cultural, academic and economic milieu of these teachers. We can say, decisively, that the teaching communities in Indian higher education institutions are ready for a challenge and poised for action.

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# Questionnaire of the Study

*Questionnaire for Teachers' Attitudes, Motivations and Conceptions of Quality and Barriers to Open Educational Resources in India: A Survey*

## 1. Introduction to this Study

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This study attempts to understand teachers' psychological and behavioral determinants that might influence use or non-use of Open Educational Resources (OERs). We are trying to investigate why some teachers' share their works and some don't, and also why some teachers reuse, revise, remix and redistribute OER. In order to investigate this we have designed this questionnaire consisting of five major parts: **Part-A** seeks general information about the respondents, **Part-B:** cover items related to attitude towards use and adoption of OER, **Part-C:** include items about motivations toward use and adoption of OER, **Part-D:** cover items related to perceptions of quality of OER and **Part-E:** cover items related to barriers to use and adoption of OER.

Kindly spend about 20 minutes to respond to all the questions/items in this questionnaire. All information gathered will be used in aggregate form only, and no individual will be identified in any of the reports from the study.

### Terms used in the Study:

**OER:** Open Educational Resources (OERs) are the materials available freely either in public domain or in an open license to use and adapt for teaching, learning, development and research.

**User:** An individual, who reuses, revises and remixes any OER.

**Non-User:** An individual, who has never reused, revised and remixed any OER.

**Contributor:** An individual, who has created, reused, revised, remixed, and redistributed (shared) OER.

**Non-Contributor:** An individual who has never distributed/ shared educational material in open license. He/she may have used, revised or remixed OER, but not shared with others.

**Attitudes:** Attitude is defined as a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person or situation. In this case the concept and practices of OER.

**Motivation:** Motivation is defined as the process or factor that pushes an individual to accomplish a task. It is necessary to remove de-motivating factors as well as encourage motivating factors to accomplish a task.

**Barriers:** Barrier is defined as a process or factor which hinders an individual to use and contribute OER.

**Quality:** Quality is defined as a characteristic of OER that teachers view from their individual perception of value/worth/fitness of purpose.

Thanks for your support. Please continue with the survey.

## 2. Part-A: General Information

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Please fill in the following details:

1. **Your Name: (Optional) :** \_\_\_\_\_
2. **Your Gender:** Male  Female
3. **Your Age:**

< 25 Years	<input type="checkbox"/>	41-45 Years	<input type="checkbox"/>
26-30 Years	<input type="checkbox"/>	46-50 Years	<input type="checkbox"/>
31-35 Years	<input type="checkbox"/>	56-60 Years	<input type="checkbox"/>
36-40 Years	<input type="checkbox"/>	60-65 Years	<input type="checkbox"/>
4. **Your Email id:** \_\_\_\_\_
5. **Your Designation:**

Lecturer/ Asst. Prof.	<input type="checkbox"/>	Professor	<input type="checkbox"/>
Reader/ Associate Prof.	<input type="checkbox"/>	Other (Please specify):	_____
6. **Your Discipline (✓ major discipline):**

Humanities and Arts	<input type="checkbox"/>	Engineering and Technology	<input type="checkbox"/>
Social Sciences (including Education and Law)	<input type="checkbox"/>	Agriculture and Veterinary Sciences	<input type="checkbox"/>
Management and Commerce	<input type="checkbox"/>	Medical and Health Sciences	<input type="checkbox"/>
Natural Sciences	<input type="checkbox"/>	Other (Please specify):	_____

**7. Your Highest Educational Qualification:**

Master Degree  M.Phil.  Ph.D.

**8. Your Teaching Experience (✓ one group):**

0-5 Years  6-15 Years   
16-25 Years  26- 35 Years   
More than 35 Years

**9. Nature of your job involves (✓ most relevant):**

Face-to-face Teaching  Work-based Training   
Distance Education  Research   
Online Teaching/ Facilitation  Management   
Blended/Hybrid  
(face-to-face and  
Distance/Online)  Other (Please specify):

**10. List three most common languages that you use in teaching:**

1. : 2. :  
3. :

**11. Name of your institution:**

**12. Status of your institution:**

Public/Govt.  Private

**13. Nature of your Institution (✓ any one):**

Face-to-Face Teaching  Dual Mode Teaching   
Distance Education

**14. Number of students in your institution (✓ any one):**

< 5,000  5,001-50,000   
Above 50,001  Other (Please specify): \_\_\_\_\_

**15. Have you used OER previously?**

Yes  No

**16. Have you contributed OER previously?**

Yes  No

### 3. Part-B: Attitude towards Open Educational Resources (ATOER) Scale

This part of the questionnaire is intended to assess attitude towards OER. Please indicate your level of agreement or disagreement by putting a ✓ mark in the appropriate column. **SA = Strongly Agree, A = Agree, UD = Un-decided, D = Disagree and SD = Strongly Disagree.**

Items	SA	A	UD	D	SD
Sharing of educational resources improves my professional respect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It gives me pleasure if someone adopts/adapts my educational resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sharing helps me to get feedback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sharing enhances my personal and organizational reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sharing of educational resources increases my profile amongst peers and others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER increases my network and sphere of influence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As a teacher, it is my responsibility to share all educational resources created by me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER improves my chance of recognition at a global level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I believe that sharing educational materials as OER will encourage others to do so as well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sharing enhances my confidence as I see myself in part of larger community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When others use my OER, it improves my sense of achievement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER helps to disseminate my ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER promotes collaboration and consortia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have knowledge of Intellectual Property Rights to understand OER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am efficient in Information Communication Technology (ICT) skills to adopt and use OER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I adopt OER for my teaching as they fulfil academic requirement of my students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My own competencies and knowledge towards OER helps me to participate or adopt OER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 4. Part-C: Motivation towards OER

This part of the questionnaire is intended to assess motivation towards use and adoption of OER. Please indicate your level of agreement or disagreement by putting a ✓ mark in the appropriate column. **SA = Strongly Agree, A = Agree, UD = Undecided, D = Disagree and SD = Strongly Disagree.**

Statements	SA	A	UD	D	SD
I believe that OER are 'good' for people as it improves their learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I try to contribute to OER to give back to society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to be involved in peer production of OER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Through OER, I can reach disadvantaged communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER will help developing countries increase access to education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sharing knowledge is a basic academic value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER caters to innate desire to learn, improve and progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER gives me opportunities to learn new things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER saves my time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER is less expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER provides access to best materials and teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER increases my self-confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Involvement in OER will give me recognition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER improves professional image	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Receiving appropriate credit (such as API scores) will help me uptake OER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like receiving comments and feedbacks from experts and seniors on OER created	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER provides us opportunities for establishing new partnerships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technology associated with OER is easy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I know about my Intellectual Property Rights under Creative Commons licenses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 5. Part-D: Perception of Quality of OER

This part of the questionnaire is intended to assess perceptions of quality towards OER. Please indicate your level of agreement or disagreement by putting a ✓ mark in the appropriate column. SA=**Strongly Agree**, A =**Agree**, UD =**Un-decided**, D =**Disagree** and SD =**Strongly Disagree**.

Items	SA	A	UD	D	SD
OER saves time of the teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OERs brings down the cost of learning materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OERs are free resources available in open license	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not need permission to re-use OER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often use OER which fulfill the pedagogical need of teaching –learning process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If OERs are appropriate in their content I prefer to use them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer to use OER from trustworthy sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open license of OER enables continuous quality improvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I use trustworthy OER from reputed institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of peer review of OERs make them susceptible to poor quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OERs assist the developing countries to have quality materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of OER is questionable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OER needs localization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 6. Part-E: Barriers to use and adopt OER

Select (by putting a ✓ mark) any 5 barriers that are most appropriate to you to use and contribute OER. Also rank these 5 identified barriers in order of importance, where 1 is the most important and 5 is the least important. In case you feel any other important barrier/s is/are not listed here you can add it in the space given below and rank it/them also.

I am hesitant/ unable to involve in OER because of the following reasons:

Sr. No.	Barrier to use and adopt OER	Select	Rank
1.	Lack of understanding of Intellectual Property licenses, Copyrights and Creative Commons licenses.	<input type="checkbox"/>	
2.	Lack of knowledge for using OER in my teaching and learning process.	<input type="checkbox"/>	
3.	Lack of recognition and rewards system for developing OER.	<input type="checkbox"/>	
4.	Lack of financial resources by institution to invest in OER.	<input type="checkbox"/>	
5.	Lack of technological support to resolve my problems.	<input type="checkbox"/>	
6.	In-ability to find existing OER on topics of my interest.	<input type="checkbox"/>	
7.	Lack of confidence about the quality of my work.	<input type="checkbox"/>	
8.	Incompatibility of OER to my university Learning Management System (LMS).	<input type="checkbox"/>	
9.	Difficulty to remix OER for specific users.	<input type="checkbox"/>	
10.	Unavailability of OER in native language.	<input type="checkbox"/>	
11.	Lack of ICT skills required to create OER.	<input type="checkbox"/>	
12.	Lack of Institutional policy on OER.	<input type="checkbox"/>	
13.	Non-user friendly OER platforms.	<input type="checkbox"/>	
14.	Poor technical infrastructure.	<input type="checkbox"/>	
15.	Difficulty in collaboration.	<input type="checkbox"/>	
16.	Inadequate bandwidth.	<input type="checkbox"/>	
17.	Current workload.	<input type="checkbox"/>	
18.	Lack of time.	<input type="checkbox"/>	
19.	Any other (please specify): _____		

## 7. Part-F: General Comments

Please provide any other information that you think useful for this study:

Thanks for participating in this survey!

Codes (For Use by Researcher Team)

Research Site:

# Interview Schedule

For Selected Teachers of Workshop on Open Educational Resources for Development

Activity theory nodes	Interview questions
Subject	<ul style="list-style-type: none"> <li>• What is your name?</li> <li>• What is your discipline?</li> <li>• What is your rank or title?</li> <li>• What is the highest degree that you possess? (PhD, MA, etc.)</li> <li>• How many years of teaching experience do you have?</li> </ul>
Tools	<ul style="list-style-type: none"> <li>• How would you describe your technology skills?</li> <li>• Where do you access the internet?</li> <li>• What types of devices do you use to access the internet?</li> <li>• Who owns the technology that you use to access the internet?</li> <li>• What type of connection do you have to the internet?</li> <li>• How much do you usually pay for internet access?</li> </ul>
Objectives	<ul style="list-style-type: none"> <li>• Have you ever <b>created and shared</b> materials on an OER repository, such as at your university, or regionally or globally?</li> </ul>
Compare contributor with non-contributor	<p><b>If NO:</b></p> <ul style="list-style-type: none"> <li>• Why have you NOT shared your teaching materials as Open Educational Resources (OER)?</li> <li>• To what extent are your reasons related to a particular personal motivation?</li> <li>• What concerns do you have about sharing your resources?</li> </ul> <p><b>If YES:</b></p> <ul style="list-style-type: none"> <li>• What type of materials did you share (e.g. videos, images, lecture notes, etc.)?</li> <li>• What tools, platforms, software, etc. do you use to create and share OER?</li> <li>• What was your perceived value with regards to sharing content?</li> <li>• How do you feel when you share your resources to others?</li> <li>• What is the significance of OER in the learning and teaching context?</li> </ul>
Compare user and non-user	<p><b>For ALL:</b></p> <ul style="list-style-type: none"> <li>• What barriers do you face in creating and sharing OER materials?</li> <li>• Have you ever used Open Educational Resources (OER) in your teaching?</li> </ul>

*Contd...*

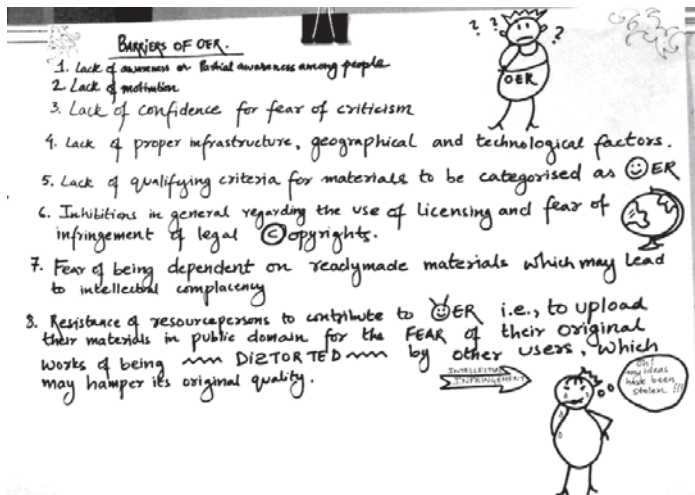
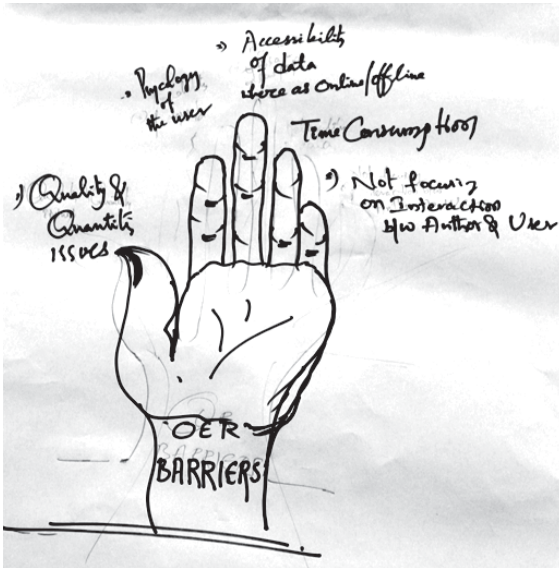


Activity theory nodes	Interview questions
	<p><b>If NO:</b></p> <ul style="list-style-type: none"> <li>• Why have you never used OER in your teaching?</li> </ul> <p><b>If YES:</b></p> <ul style="list-style-type: none"> <li>• What goals or benefits are you seeking through the use of OER in your teaching or course delivery?</li> </ul> <p><b>For ALL:</b></p> <ul style="list-style-type: none"> <li>• What barriers do you face in finding and using OER materials?</li> </ul>
Rules and regulations	<ul style="list-style-type: none"> <li>• Did you have the knowledge of copyrights of educational material before the workshop? if yes then explain. If no, what you have understood now?</li> <li>• To what extent are you concerned about losing your intellectual property by creating and sharing your materials?</li> <li>• Did you know about Creative Commons (CC) licences before the workshop?</li> <li>• How knowledgeable do you consider yourself in using CC licenses to share your own OER?</li> <li>• To what extent are you concerned about infringing the copyright of others by using others' teaching materials?</li> </ul> <p><b>For CREATORS:</b></p> <ul style="list-style-type: none"> <li>• When creating or assembling educational resources, how do you use materials that are licensed under creative commons or other free / open licenses?</li> <li>• Do you think sharing OER has changed the way you create materials?</li> <li>• To what extent has creating and sharing OER changed your teaching practice?</li> <li>• How has your OER sharing practices impacted your department's practice?</li> </ul> <p><b>For ALL:</b></p> <ul style="list-style-type: none"> <li>• Could creating and sharing OER potentially change the institution's practice?</li> <li>• To what extent would a policy on OER influence your choice to create and share OER?</li> <li>• What kind of policy would your institution need to put in place to influence your choice to create (more) OER choice?</li> <li>• Does your institution place any restrictions on internet use? If YES, what are they?</li> </ul>
Community	<ul style="list-style-type: none"> <li>• As an academic you have many roles such as teaching, research, administration and social responsibility. Which role is the most important one for you, and why?</li> <li>• To what extent are your colleagues aware of OER?</li> <li>• In your opinion, to what extent do you feel your colleagues value OER?</li> <li>• What value do you feel the institution places on OER?</li> </ul>

*Contd...*

Activity theory nodes	Interview questions
	<ul style="list-style-type: none"> <li>• How does your discipline deal with OER, and how does your discipline impact your own approach to OER?</li> <li>• How does the culture of your department and/or institution influence your decisions around OER use and creation?</li> </ul>
Division of Labour	<ul style="list-style-type: none"> <li>• To what extent are you concerned about the time it takes to adapt and share materials?</li> <li>• Are you concerned about the cost of preparing materials?</li> <li>• Do you feel it is part of your role to contribute OER?</li> <li>• Does your institution provide support structures for your creation and/or using of OER?</li> <li>• Do you think collaboration is important in the creation of OER? If YES, how? If NO, why not?</li> </ul>
Desired Outcomes	<ul style="list-style-type: none"> <li>• To what extent are you concerned about the way others may re-use your materials?</li> <li>• Are you concerned about lack of user feedback?</li> <li>• To what extent are you concerned that materials may be used out of context?</li> <li>• To what extent are you concerned about the quality of your teaching materials?</li> <li>• How do you perceive the quality of most OER?</li> <li>• To what extent could OER fulfil the pedagogical intent of your teaching?</li> <li>• What are the challenges of OER use in developing countries?</li> </ul>
Contradictions & Alignments	<ul style="list-style-type: none"> <li>• Can you think of any other obstacles that might hinder the creation and use of OER?</li> <li>• Can you think of any other mechanisms that might encourage teachers to create and use OER?</li> <li>• Do you feel you now have enough skills to identify useful sources of OER and decide on their potential value, or would you need additional support?</li> <li>• Do you have anything else you'd like to add regarding OER?</li> </ul> <p>[MANY THANKS!]</p>

# Some Outputs of Snowball Sessions on Barriers to OER



- ✱ Lack of technical know-how for teachers & Students.
- ✱ Lack of Infrastructure & affordability in developing & Under developed Countries.
- ✱ Lack of quality Control.
- ✱ Reluctance to change / -ve attitude
- ✱ Language barrcers
- ✱ Lack of Relevance / out of Context.

Group

### BARRIERS TO OER

C/C BIRSA

1. STREOTYPE THINKING - NON AWARENESS OF OER, PRECISENESS, ROLE MODELS
2. LACK OF TECHNICAL SUPPORT & KNOWLEDGE. -
3. INSTITUTIONAL APPROACH.. - ATTITUDE OF STAKE HOLDERS  
STAFF CREATIONS
4. LACK OF OER IN URDU & TRANSLATIONS. - SOCIAL AND NATURAL SCIENCES  
ISSUES
5. NON INCLUSION IN ADI (UGC) FOR CAS - POLICY PROBLEMS HAD  
EQUIVALENCE OF DEGREE
6. FINANCIALLY NON LUCRATIVE - FINANCIAL BURDEN
7. POLICY LEVEL DECISIONS  
- POLITICAL, ACADEMIC, BUREAUCRATIC
8. INFRASTRUCTURE IN WORK PLACE
9. COPY <sup>RIGHT</sup> ~~WARR~~ ISSUES.
10. TIME CONSTRAINTS
11. LACK OF TRAINING AND CAPACITY BUILDING.
12. QUALITY ASSESSMENT INDICATORS
13. General awareness on use of OER.

# Informed Consent Form

**Sub:** Research on *“Teachers’ Attitudes, Motivations and Conceptions of Quality and Barriers to Open Educational Resources in India”*

This research attempts to understand teachers’ psychological and behavioral determinants that may influence the use or non-use of Open Educational Resources (OER). We are trying to investigate why some teachers’ share their works and some don’t.

**Procedure:** In order to investigate above research questions, we have designed an interview schedule consisting of questions to investigate issues related to the topic. These questions will be asked to you by an interviewer and would be recorded. You can skip any question that you do not want to respond on exit at any point of time during the interview.

**Potential risks and discomforts:** There are no anticipated risks to your participation. When you feel discomfort at responding some questions, please feel free to ask for more clarification or to skip the question.

**Potential Benefits to subject and/or to the society:** You will not directly benefit from your participation in this research study. On the other hand, your participation in this research will help us and the academia in understanding the psychological and behavioural determinants which assist or hinder the uptake of OER. This may lead to formation of such policies and practices which will facilitate uptake of OER.

**Length of time:** This interview will be of about 30-60 minutes.

**Type of participation:** Your participation is voluntary and refusal to participate will not result in any consequences or any loss of benefits that you otherwise are entitled to receive.

**Rights of research Subjects:** Your participation in the interview is completely voluntary and you have the right to refuse to participate or leave at any time. You can skip any question if you don’t feel comfortable answering. You are free to ask questions for clarification of any doubt at any time. If you agree to participate in this study, you will be interviewed which will be audio recorded. Your name shall not be disclosed at any point of time. The information provided by you shall not be

used for any purpose other than the objectives of research. Thus, your confidentiality will be maintained throughout the research process and after. When the results of the research are published or discussed in conferences, no information about you will be included that would reveal your identity. Sentences or questions you ask the interviewer to skip will not be used.

**Opportunities to be Informed of Results:**

In all likelihood, the results will be fully available around December, 2015. The results of the research will be available under Creative Commons license on our research communication website <http://roer.cemca.org.in>.

**Identification of the researcher:**

If you have any questions or concerns about the research, please feel free to contact any one of the following:

Sanjaya Mishra, Ph.D.  
Principal Investigator, ROER4D  
C/o CEMCA  
13/14 Sarv Priya Vihar  
New Delhi 110016  
Email: [smishra@col.org](mailto:smishra@col.org)

Director  
CEMCA  
7/8 Sarv Priya Vihar  
New Delhi 110016  
<http://www.cemca.org.in>

Your signature below indicates that you have read the above information and voluntarily agree to participate in this study.

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

# Code Families and Codes (as per Activity Theory)

## Code Family: Rules

**Codes (5):** [Knowledge of using CC Licenses] [Having prior Knowledge of IPR] [Impact of OER policy on teachers' choice of creating and sharing educational resources] [Type of OER policy required] [Incentives and recognition]

## Code Family: Tools

**Codes (9):** [Access Point] [Device used] [Infrastructure] [Material Type] [OER Creation Tools] [OER Sharing Platform] [OER Sharing Tools] [Support Services] [Technology Ownership]

## Code Family: Subjects

**Codes (4):** [OER users] [OER contributors] [Having prior Knowledge of IPR] [Awareness of OER]

## Code Family: Community

**Codes (5):** [Use of OER by others in the community] [Department culture to support OER] [Institutional culture for sharing] [Impact of Discipline on OER usage] [Impact of OER creation and sharing on Department practice]

## Code Family: Division of Labour

**Codes (3):** [Institutional support] [Time saving] [Collaboration]

## Code Family: Objectives

**Codes (4):** [Reasons for sharing] [Benefits of using OER - Pedagogical and others] [Role of OER in teaching and learning] [Personal motivation]

## Code Family: Contradictions and Alignments

**Codes (5):** [Barriers to find OER] [Lack of ICT skills] [Poor technology infrastructure] [Lack of time] [Sharing concern and copyrights]

## Code Family: Outcomes

**Codes (4):** [improved quality of teaching and learning] [individual recognition and reward] [Availability of more material] [Societal value for money]

