Evaluation of Online Course on Understanding Open Educational Resources

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Santosh Panda

COMMONWEALTH *of* LEARNING

The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources and technologies.

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Abbreviations

ACC	Austin Community College
ADA	Americans with Disabilities Act
ADDIE	Analysis-design-development-implementation model
APEC	Asia-Pacific Economic Cooperation
CC	Creative Commons
COL	The Commonwealth of Learning
HRD	Human Ressource Development
ICT	Information and Communications Technology
IP	Intellectual Property
IGNOU	Indira Gandhi National Open University
IOEP	Inclusice open educational practices
JISC	Joint Information Systems Committee
LearnOER	COL online course platform 'Understanding Open Educational Resources
MERLOT	Multimedia education resource for learning and online teaching (California State University system)
MIT	Massachusetts Institute of Technology
MOODLE	Modular object-oriented dynamic learninmg environment
NROER	National Repository of Open Educational Resources (India)
ODL	Open and distance learning
OECD	Organisation for Economic Co-operation and Development
OEP	Open educational practice
OER	Open educational resources
OERu	Open educational resources universitas
RADL	Remote access distance learning
ROE	Return on expeactations
ROI	Return on investment
ROTI	Return on training investment
TEL	Technology-enabled learning
USA	United States of America
UNESCO	United National Educational, Scientific and Cultural Organisation

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EXECUTIVE SUMMARY

Keeping in view the increasing spread of OER activities across the globe, and especially in the Commonwealth countries, for teaching, learning, training, business activities and specifically for resource-based learning and teaching, and also keeping in view the lack of and high demand for training courses on OER, the Commonwealth of Learning initiated an online course on "Understanding Open Educational Resources" in 2015 and launched an online platform[1] for the course in 2018 in which 4,079 participants from 64 countries registered for free. The course was successfully completed by 1,419 participants (at the time of this evaluation). As a follow-up and for obtaining feedback to measure the success of the course, COL initiated an evaluation of the LearnOER platform in May-June 2019 through a structured online questionnaire (closed-ended and open-ended) comprising statements/ questions relating to the online course, open educational resources, and questions on individual and institutional costs.

The online course was intended to be evaluated from a return-on-investment (ROI)/ return-on-expectations (ROE) perspective. 127 participants responded, of which 118 were found complete in all respects and were put to analysis.

The following were the main findings:

- The curricular aspects of the online course relating to learning objectives, content structure, learning activities and assignments were highly appreciated by the participants.

- There was high appreciation for teaching-learning aspects, especially interactions, help and FAQs, alignment of visuals and assignments to course content, and additional resources.

- The respondents were highly satisfied with the technical aspects of the course.

- The overall satisfaction was very high at 4.54 out of a score of 5.

- As an average, it took about 135 minutes to complete the course successfully. On the other hand, after completion of the course, the participants are able to save, on an average, about 5 hours per week in their OER activities.

- Most participants reported to have derived more value than time spent on the course; gained high knowledge, skills and attitude; felt very empowered and confident in undertaking more OER activities in current and future work; and will be glad to recommend LearnOER to others to go through.

- The online course contributed reasonable ROI/ ROE and significant impact on the current and future work of most of the participants who are involved in teaching, training, business activities, and independent consultants.

- The institutional unit cost for the course was very low at CAD 31 for successful participants, and individual unit cost was very negligible and was incurred by only 9 participants.

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[1] https://learnoer.col.org/

- When we consider the average programme unit cost by COL along with the average programme benefit unit cost of LearnOER, the estimated ROI results in 212.42 which is highly satisfactory. Further, if the cost saving due to this being a free course is considered, the ROI is estimated to be 354.09%. This, alongside the intangible benefits for Return-on-Expectations which is very satisfactory, could be considered as long-term investment in human resources for OER. Considering the institutional perspective, the ROI for COL is 254.1%.

The participants have suggested further to continue offer of LearnOER with minor revisions; offer of next level online course on OER in a modular fashion, and networking of the successful participants/ graduate for further collaboration and their engagement in advocacy and offer of further training on OER and related aspects. The results have been discussed in relation to research studies on this area, as also for policy and practices on OER.

Chapter 1:

INTRODUCTION

The piece of research reported in this monograph is an evaluative research study concerning post-facto evaluation of an online course on "Understanding Open Educational Resources (OER)" (through the LearnOER Platform) offered globally by the Commonwealth of Learning (COL). The online course has been offered by COL since 2015 through Moodle, but migrated to the new platform in 2018, and out of a total 4,079 registered users from 64 countries, a total of 1,419 participants have successfully completed the course (at the time of the research). OER is part of the COL's priority area of work facilitated through the Technology-Enabled Learning (TEL) initiative comprising several innovative projects being implemented across institutions globally. The current reporting on the evaluative research focused primarily on evaluating the online course from the point of view of Return on Investment (ROI) / Return on Expectations (ROE) framework.

In what follows is a brief analytical summaries on: challenges to accessing textbooks; open educational resources (OER); need for capacity building on OER; the COL online course on OER; ROI/ROE in online learning; OER and online learning--evaluation criteria/framework; and the objectives of the present evaluative study. The subsequent chapters deal with the following: Chapter 2 (Methodology), Chapter 3 (Analysis of Data and Results), Chapter 4 (Implications for Policy and Practice).

Access to Textbooks: Challenges

Textbooks have traditionally been used by both students and teachers as important source of information and knowledge; and the conventional teaching-learning centre around classrooms, textbooks and teachers. For over a century, textbooks have done well at all levels of education. Textbooks and associated assignments have contributed to enhanced student engagement and academic performance (Skinner & Howes, 2013; Darwin, 2011). In almost all countries of the world, and in the USA as discussed below, both students and teachers value textbooks as the main source of learning. With increasing costs, and with developments in both innovative pedagogies and in ICTs including social technologies and social networks, this is being questioned if at all textbooks hold any prime relevance in teaching-learning today. It is also being questioned in so far as exorbitant costs are associated with textbooks. However, on the other hand, the textbook publishers have of late resorted to accruing benefits from the process of digitization of resources. In any case, the increasing cost of textbooks has increased the cost of graduation as also the overall unit cost of education.

In a recent survey (Seaman and Seaman, 2018) in the USA covering over 4000 faculty members and departmental chairpersons, it was found that student access to textbooks was constrained due to high cost; and the faculty were disturbed by the high price charged by commercial textbook publishers, as well as frequent updates compelling students to buy the revised editions.

Therefore, not surprisingly, the faculty resorted to supporting used textbooks and book rentals, and skipping sections of chapters and /or using such content for which they had their own notes. While above 98% used copyrighted printed textbooks, only a few were aware of licensing of printed or digital texts. On the other hand, the use of OER has been gradually increasing at least as supplemental material and in at least one of the many courses that the faculty teach. The awareness of OER increased from 5% (very aware) in 2014-15 to 13% in 2017-18. Normal awareness also increased from 15% to 18%. The above research underlined that increasing cost of textbooks shall push up the faculty toward OER use, and also that awareness programmes/training need to be built into the faculty development programmes.

This is, therefore, not surprising that the academic community of students and teachers are pushed to benefit from what is called open textbooks and open publishing. In a global survey, Butcher and Hoosen (2012) underlined that in the USA nearly 70% of the students could not afford textbooks due to high cost, and that nearly 60% of the dropped out students had ascribed increasing cost of textbooks as one of the reasons for this. Similar increasing cost of textbooks leading to finding out alternatives is the case with Brazil, South Africa, among others, with the result that governments are putting in money to develop open textbooks and, if required, for printing and distribution either free of cost or the at cost price. Open-licensed textbooks and digital textbooks/ e-books are emerging as alternatives to traditional textbook publishing and use. E-books are being provided for free by publishers like Textbook Media, and Flat World Knowledge under the scheme of 'freemium' where the loss incurred due to supply of free e-textbooks is compensated by charging a premium to other services offered by them (Butcher & Hoosen, 2012). In the case of school education in India, the National Council for Educational Research and Training (NCERT), responsible for curriculum standardization of school education in the country, provides e-textbooks for free on its platform of NROER, and the same textbook is made available in print and in bound form at a low premium. On the other hand, the Indira Gandhi National Open University (IGNOU) while provides its students self-learning print and audio-video resources built into student fees, all these resources are globally available for free on its digital repository of *E-Gyankosh* (Panda & Garg, 2019). However, some of these are not necessarily OER themselves, but they do increase access to educational materials.

Globally, many institutions are moving to open access publishing or encouraging its faculty to publish in open access journals. Those, like the Athabasca University Press, which provide free access to their books and charge a price for the printed books did not experience any loss to the overall sale of printed books (McGreal & Chen, 2011). On the other hand, open access publishing provides for greater cost savings as also wider access to and benefits from research journals (Houghton & Oppenheim, 2010).

Besides cost savings, use of OER also contributed to enhancing the quality and quality of student learning outcomes (Hilton III, 2016). The author critically analysed nine research studies which substantiated these findings, especially when compared to traditional textbooks (Allen et al, 2015; Fischer et al, 2015; Robinson, 2015; Hilton et al, 2013; Pawlyshyn et al, 2013; Feldstein et al, 2012; Hilton & Lamon, 2012; Bowen et al, 2012; Lovett et al, 2008). Though the author concluded from the review that OER reduced costs and maintained the level of student learning outcomes, a caution was underlined: "researchers and educators may need to carefully examine the rationale for requiring students to purchase commercial textbooks when high quality, free and openly-licensed text-books are available" (Hilton III, 2016, pp.588-589).

[2]

Open Educational Resources

While OER is gaining substantial ground in almost all parts of the globe, as underlined by Mishra (2017), it is a wrong public perception that whatever available on the web is free and open content, and this perception reveals poor copyright awareness among teachers and learners, and therefore this warrants courses and/ or training programmes on copyright. In educational and training settings, there is serious constraint of high price of textbooks and other digital resources on education and training, and therefore we always feel the need for digital and non-digital resources to freely adapt to suit the purpose without any copyright clearance. This is where the OER movement assumes significance. In 2002, the UNESCO (2002) coined the term 'open educational resources' (OER) indicating open provision and open use of educational resources (which are greatly facilitated by developments in information and communication technologies), but for non-commercial purposes. The 2012 Paris Declaration (UNESCO, 2012) clearly stated OER as:

> 'teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permit no-cost access, use, adaptation and redistribution by others with no or limited restrictions' (p.1).

These materials are protected by an open license system (Creative Commons[2] provides the most predominantly used open licenses), for openly accessing, re-using and redistributing such resources. It is the Flora Hewlett Foundation which has been the largest contributor to and promoter of OER globally, and since 2001 has put in above US $170 million for its cause (Bliss & Smith, 2017).

Vis-a-vis the open education movement of the past century, the first OER initiative was MERLOT, created by California State University in 1997; and a year later David Wiley of Utah State University advocated free and open content licensing (Bliss & Smith, 2017). Subsequently, the Massachusetts Institute of Technology (MIT), with support from Hewlett Foundation, opened up its courseware to the public under OpenCourseWare. Further in 2001 three Stanford professors Lessig, Abelson and Eldred created Creative Commons open licensing system to protect the openness of content for further use, reuse, remix and redistribute. The Hewlett Foundation and Creative Commons vigorously promote CC-BY for reuse and repurposing of educational resources and have upheld the original formulation of David Wiley for 5R of open content: retain, reuse, revise, remix, and redistribute for free (Jhangiani & Biswas-Diener, 2017). One restriction still continues to limit the purpose of OER, i.e. CC-BY-ND under which the user can use freely but with acknowledgement to the author, and without any freedom to create derivatives (ND). Thus, the ND licenses are not considered OER (Green, 2017).

The Hewlett Foundation supported several organisations in its efforts to promote OER, including UNESCO, OECD, and COL. The COL laid major focus on promoting OER including national and institutional OER Policy within the Commonwealth; *and the present online course on OER (which is evaluated and reported in this monograph) is an important step toward that direction.* The OER derives from and significantly supports the Hewlett Foundation review (Atkins et al,

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[2] https://creativecommons.org/

2007) that OER should further lead to develop a new culture of learning, possible with significant developments in the digital world. Unlike many online courses not being free and not available under open license, the COL OER online course is a free course as well as is available under CC BY-SA license. Further, it also underlines that the course participants shall also promote these open values in their organisational /institutional reforms, especially in the context of ODL/Open University/Open Schooling. The review on historical development of OER by Bliss and Smith (2017) had one significant conclusion: "Surveys indicate that only a small percentage of professors and teachers know very much about OER even if they use open materials" (p.19). This is very significant and supportive of what COL has done through the OER online course under review.

Such online courses on OER, it is believed, may lead to more of open education practices (OEP) where institutions facilitate the creation, use and reuse of OER. This is supportive of open education which, besides OER, includes open technologies, open governance, and open sharing; and these may lead to change in assessment and accreditation strategies. Open educational practices include an array of policy and operational strategies including open educational resources, open or public pedagogies, open learning, open scholarship, open sharing, and open technologies (Beetham et al, 2012).

Open educational resources, leading to open educational practices, cater to benefits for a variety of stakeholders: institutions, individual faculty, individual students, and the community. Further, there is also a need to extend OER to inclusive open educational practices (IOEP) (Teixeira et al, 2013), thereby extend to 'OER for All', and involve learners as co-produces of learning. In this context, the model of OEP given by Paskevicius (2017) may be useful in constructively aligning content with pedagogy in educational practices.

The development toward 'open education' is critical to furthering the 'open educational resources' (OER) movement; and critical practices in 'open learning' vis-a-vis OER have significantly contributed to 'open pedagogy'. These all put together have furthered the institutional and collaborative mechanism of 'open educational practices'. The initial movement of 'open education' is an outcome of the dissatisfaction associated with elitist classroom education along with hidden curriculum and with prime focus on what is called 'diploma disease'. The erstwhile works on 'deschooling society' and 'pedagogy of the oppressed', and the later developments in learning society, lifelong learning, open distance learning and open university education / open schooling – all contributed to opening up education by removing constraints of perception, time, space, qualification, experience, ability, socio-economic status, among others.

Open learning is a practice within the curriculum and pedagogy, allowing each learner to choose the individualized and collaborative learning paths with flexibility to achieve the desired learning objectives. When open learning is built around OER, this results in open pedagogic and open educational practices. The *Learning from WOeRK* project within the UK OER programme underlines that "Learners can access a curriculum which is more flexible, visible, tailored, blended and integrated with real life experience, which allows them to integrate learning and work and which can provide a bridge into university from work-based or informal learning"[3].

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[3] https://oersynth.pbworks.com/w/page/51685249/OpenPracticesLearning

Under the JISC *Developing Digital Literacies* programme, the learners combine informal and formal learning so as to provide a link between various learning practices that the learners are engaged with. The UK OER Project is the best example of linking open learning with OER effectively. Assumptions about academically acceptable content and their use were challenged as an experience gained within this programme. *This is where a formally structured online course on OER for education and training as offered by the Commonwealth of Learning assumes significance.*

The *Open Practices Learning* within the UK OER project underlined that for effective 'open, self-directed and participative learning', it is important that both the teachers and the learners need to possess sufficient digital literacy. *One of the focus points of the LearnOER was to enhance such digital literacies of participants while engaging in the online course itself.*

Instead of the content being constitutive of the curriculum, in such online course, the learners were engaged in viewing content as artifact of learning and sharing of knowledge. The open pedagogic practices were visualized as part of the curricular transaction such that learners were encouraged to visualize contexualisation of OER within their organizational structure for education and training. While content was both structured and open (especially in respect of learner freedom to choose and engage with a set of authenticated open content on OER), what was designed to be more open was learner engagement with use of the OER course to create their own plan of action for flexible use of OER open pedagogies and open educational practices. The features of OER to reuse, remix, redistribute was creatively considered by the participants for institutional contexualisation and activities of co-construction. The built-in open pedagogy encouraged learners to repackage content, review and select open content, and themselves produce OERs. *The COL online course on OER visualized this as one of the objectives that the course should promote.*

OER and Need for Capacity Building

Irrespective of the regions in the globe, it has been observed that most institutional leaders and faculty lack awareness about copyright and intellectual property right issues, and availability of digital and open educational resources (Seaman & Seaman, 2018; Bliss & Smith, 2017). For open education, open pedagogy, open educational resources, and open educational practices to occupy the mainstream teaching-learning and to be effective in education and training, it is imperative that those engaged with these need continuous awareness training and continuing professional development on OER. In respect of especially OER-based capacity building, based on courses, programmes, and resources, Bossu and Willems (2017) underlined the massive work undertaken by the Commonwealth of Learning (COL), the Joint Information Systems Committee (JISC), the OER Hub, and the OER Universitas (OERu). They also pointed out that, in Australia, since the public expenditure on professional development in higher education has been reduced, it is essential to look forward to alternative, low-cost but effective professional development mechanisms through OER and other ICT interventions. In respect of developing feasibility protocol for OER and OEP in higher education for the Australian government, Bossu et al (2014) formulated the following four questions for the academic staff to reflect and engage with:

- Are academics reluctant to make their contents available as OER?
- Are academics concerned about the quality of OER available?

- What are the negative perceptions that academics have towards OER (time consuming activity, hard to find resources, low quality of the resources, etc.)?
- What type of skills and knowledge are required by individuals in order to take advantage of OEP?

In a recent communiqué, UNESCO (2019) revised the draft recommendations on OER (to be adopted by UNESCO General Conference in November 2019) with five objectives:

i)   Building capacity of stakeholders to create, access, use, adapt and redistribute OER.
ii) Developing supportive policy.
iii) Encouraging inclusive and equitable quality OER.
iv) Nurturing the creation of sustainability models for OER.
v)   Facilitating international cooperation.

As could be noticed, the first priority in the current year resolution is capacity building for OER. It is therefore important to ascertain training needs and design capacity building for OER. A study by Gaba & Mishra (2015) in the Asian dual-mode distance teaching institutions, revealed top priority for skills building in OER development and understanding of open licenses as immediate short-term training needs. In a recent study on staff needs for capacity building on ODL, which is equally applicable for OER and resource-based learning, Roberts (2018) underlined the priority personnel of 'technology experts' and 'instructional designers' where there is a gap between existing competencies and further training needs. In an effective design-based training on integration of OER at the Open University of Sri Lanka, Karunanayaka and Naidu (2013, 2018) reported that the OER-based e-learning (OEReL) initiative had significant impact on faculty knowledge, skills, attitudes, motivation, satisfaction, self confidence, application, team spirit, and the culture of sharing. Notwithstanding many such national and institutional initiatives, there is a huge need for capacity building on awareness, knowledge, skills, attitude, among others, on OER in every institution and organization in all the countries. The COL 'LearnOER' is an important step toward that direction.

'LearnOER': OER Training through Online Learning

Sharing of educational material is part of the DNA of COL. In 2011, COL became the first intergovernmental organisation to adopt an OER policy[4]. In 2012, COL with UNESCO organised the 1st World OER Congress, and in 2015, development and promotion of OER became a priority in its strategic plan. COL has been supporting various activities related to OER and have supported educational institutions and countries to develop OER policies. It also offers several training opportunities on OER in the partner institutions. In 2017, COL also released a global report[5] on OER analysing the developments in the field.

In 2015, considering the priority, it was decided to develop a short course that could be used in various initiatives of COL and also help anyone learn and understand about OER in a short span of time. So, COL commissioned to develop an OER on OER using already available information

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on the topic. Once a print version[6] was ready, they developed an online version for its use by anyone around the world as an open course[7]. This course was planned as a truly open course without any need for log in and password. However, slowly this became an impediment in reporting at COL as the data was only available on usage and not exactly on completion. At this stage, it was decided to update this course and develop a HTML5 version of the course. While the previous version was developed in Flash and delivered using MOODLE learning management system (LMS), the current version is based on current HTML5 technology, and can help ascertain who is completing the course. COL also regularly monitors the course and follows up with non-users regularly without violating their privacy. Any user is followed up not more than two times to help them complete the course. So, the current evaluation of the course is based on the people registered and completed the course on the new HTML5 based 'Understanding OER' platform[8] launched in August 2018[9] .

Evaluation of Online Courses and OERs

Online learning practices very flexible and open pedagogies, and each LMS has its own pedagogic framework and possibilities. Similarly, use of OER in online courses gives credence to open and flexible learning, open pedagogies and open sharing. It is, therefore, imperative to look into the quality dimensions of online learning as well as OER to derive the evaluation framework and the standardized criteria of evaluation. In a recent work, Stamenka and Daniel (n.d.) outlined the Quality Matters[TM] Rubric Standards for online learning comprising eight dimensions:

- Course overview and introduction.
- Learning objectives (competencies).
- Assessment and measurement.
- Instructional materials.
- Learner interaction and engagement.
- Course technology.
- Learner support.
- Accessibility.

From the learners' point of view, the quality perceptions included the following seven factors:

- Use of diverse range of media for communication and learner support.
- Communication and collaboration strategies.

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[6] http://oasis.col.org/handle/11599/1013
[7] https://tell.colvee.org/course/view.php?id=3
[8] https://learnoer.col.org/
[9] https://www.col.org/news/news/online-course-open-educational-resources

- Appropriate and high technical standards.

- Student expectations and cost-value assessment.

- Information availability an transparency.

- Flexibility in the structure of the course.

- Didactics including learning outcomes.

- Appropriate resources and teaching-learning methodologies.

Each of the above can be further expanded into micro variables at the stage of design and development as also at the stage of course evaluation. While 'talent-lms' underlined four important variables (visual appeal and branding, appropriate learning materials, the assessment process, and cultural fit) (Andriotis, 2018) and included in the impact dimension variables like: new knowledge and skills, efficiency, employee satisfaction, and cultural impact, the ASSETT criteria for hybrid and online courses (University of Colorado, n.d.) underlined six important criteria of: readiness, rigour, instructional materials, assessment, support, and student learning experiences. A related authentic work is by the US Department of Education (2008), and from the pedagogic point of view the online learning through online networking of Salmon (2002) proposed five learning steps: access and motivation, online socialization, information exchange, knowledge construction, and development.

A very comprehensive guidelines has been proposed by UW-La Crosse (2014) covering 58 indicators (27 indicators for course design and development, 24 indicators for course delivery, and 7 indicators for course review). Concerning best practices for assessment for online programmes, Wang (2006) reviewed various literature and suggested five significant macro variables as best practice: administrative leadership and support, faculty support, student support, curriculum design and instruction, and assessing student achievement. Holzweiss et al (2014) went a step further to suggest that student learning experiences desired more of deeper levels of learning based on constructivist theory of learning.

In a recent research on student perception of quality online learning experiences, Gomez-Rey et al (2016) summarized 11 quality indices as follows:

• Learning support	• Learning content
• Social presence	• Course design
• Instruction	• Learner satisfaction
• Learning platform	• Knowledge acquisition
• Instructor Interaction	• Ability of transfer
• Learner interaction	

These variables need to be seen in relation to the five pillars of quality of online learning proposed by Sloan-C: access, learning effectiveness, student satisfaction, faculty satisfaction, and scale/cost-effectiveness.

Two important institutional faculty guides/checklists for evaluating Open Educational Resources have been proposed by BCcampus, Canada and Austin Community College, USA. The BC-OER of BCcampus, sponsored by the Canadian Ministry of Advanced Education, Skills and Training

proposed six indicators for OER evaluation: accuracy, relevance, production quality, accessibility, interactivity, and licensing, with checklists provided for each of the six indicators. A still more comprehensive checklist, along with detailed indicators for each variable, has been released by ACC, USA comprising: breadth perspectives and accuracy, alignment, production quality, ADA compliance, student access, student engagement, cultural relevance and sensitivity, and licensing.

The above reviewed quality indicators and evaluation checklists for online learning as well as OER have been considered in the present evaluation of Online Course on OER of the Commonwealth of Learning. These indicators have been interwoven with the five variables of Return on Investment to arrive at the evaluation framework for this study.

Return on Investment in Online Learning

The focus of this research study is not only post-facto evaluation of an online course on OER from graduate and institutional perspectives, but more so possibly within a framework of Return-on-Investment (ROI)/ Return on Expectations (ROE). As the terminology suggests, this falls under the domain of educational costing. In the context of distance and online learning, Bramble and Panda (2008) noted that, besides the cost categories of capital and recurring, production and delivery, and fixed and variable costs, also the types of cost analysis include: (i) cost benefit analysis, (ii) cost efficiency analysis, (iii) cost effectiveness analysis, (iv) cost comparisons, and (v) return on investment (ROI). The authors had mentioned a specific study in this regard (Osiakwan and Wright, 2001) in respect of remote access distance learning (RADL) which still stands out as a foundational work to refer to in so far as ROI of technology-enabled learning is concerned.

In a study in the American context, Osiakwan and Wright (2001) identifies and applied seven cost categories for their analysis: fixed costs (course material, technology, rent, instructor), variable costs (instructor, subsistence, travel, printing and shipping, registration and billing), variable costs for RADL, cost to students, break-even analysis, profitability analysis, and ROI analysis. In the context of return on training investment (ROTI), Barker (2001) further explained associated terms including: evaluation, validation, proof of concept, benefit-cost ratio, cost-effectiveness, cost-utility analysis, return on expectation (ROE), value for money, training investment analysis, and training transfer. The author critically analysed a host of ROI/ROTI models including: basic cost-benefit analysis, training utility formula, Kirkpatrick evaluation model, the Bell system approach, productivity measurement, value added analysis, discounted cash flow, payback period, information economics, results oriented HRD model, balanced scorecard, measuring intellectual assets, and impact comparison of alternative investments, and further noted that the Kirkpatrick four-level model was "by far the most well-known method of training evaluation" (Barker, 2001, p.31). ROI considers the additional net revenue that the training will contribute to, minus the additional cost, and divided by additional total cost (Rossman, et al, 2019).

A s a final step in the ADDIE model for summative evaluation, the Kirkpatrick four-level model in 1975 presented four steps in evaluating training: reaction, learning, behavior, and results

(Kruse, 2006). ROI was added as the final step in this process. The five levels and the focus of measurement include the following (Phillips, 2007):

1. *Reaction and planned action* (measures participant/ graduate satisfaction and subsequent planned action).

2. *Learning and confidence* (measures resultant changes in the knowledge, attitude and skills of graduates).

3. *Behaviour / application and implementation* (measures process of implementation and impact on behavior at workplaces).

4. *Results / business impact* (measures changes in business/institutional operations).

5. *Return on investment* (measures benefits to the costs).

In case of ROI, the data are converted, as much as possible, to monetary benefits/values, and the costs involved in the solution of similar problems or implementation of similar activities at the organizational/institutional level are captured. Intangible benefits are also identified, and both tangible and intangible benefits suggest the impact of the activity (education and /or training) completed. The ROI model has further been updated to include what is called 'Return on Expectations' (ROE) which captures the congruence of institutional strategic objectives, the expectations of the outcomes of education/training, and evaluation of expectations/objectives and outcomes.

The ROI and ROE may be represented as follows (Figure 1):

| Education and training programme objectives, design and implementation. | Reaction, satisfaction, planned action. / Changes in knowledge, attitude, and skills. | Process of implementation and behaviour impact at work place. / Changes in institutional/ individual operations. | Tangible benefits (ROI) / Intangible benefits (ROE) | I M P A C T |
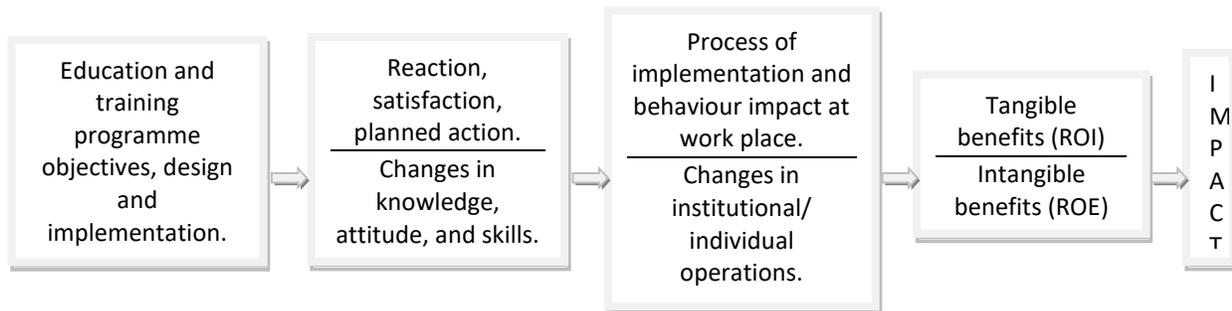
Figure 1: Impact analysis vis-a-vis ROI and ROE

The ROI is calculated through a simple formula:

$$\text{ROI} = \frac{\text{Net project/programme benefits}}{\text{Project/Programme costs}} \text{ x } 100$$

It may be noted that it is very difficult to convert each accrued benefit into monetary values; and, therefore, it is important to consider the changes in behaviour of the trainee/graduate in terms of understanding the responsibility of applying the benefits accrued to further application and programme solutions, and also that the institutional management has an impact such that they help/facilitate the achievement of reforms and solutions in the organization.

[10]

The framework of evaluation/impact of the online course on OER undertaken in this study includes the above aspects of both tangible and intangible benefits, including the ROI from the provider's point of view (in this case, the Commonwealth of Learning) and ROI from participants/graduates point of view (in this case, the successful completers of the online course on OER). [It may be noted here that all the three aspects – participant variables, e-learning evaluation variables, and OER evaluation variables – have been included in the conceptual framework of this online training evaluation vis-a-vis ROI as described in the section below.]

To summarise, ROI/ ROE has been considered here as a performance measure for both providers as well as receivers (McNamee, 2018), considering initial reactions as well as organizational impact, involving: reactions (post-training survey), learning (demonstration of knowledge and skills), behaviours (improvement in efficiency), and impact (gain in productivity).

The Present Study

The present study is a piece of post-facto evaluative research on the effectiveness and impact of the COL online course 'Understanding Open Educational Resources' (LearnOER). Besides the findings to be related to institutional and individual variables asked for in the questionnaire, the evaluation combined three dimensions – online learning, open educational resources, and return on investment/ return on expectations – and, therefore, these three were taken into account to be juxtaposed in the final analysis of data. Summarily, the online learning course on OER was based on OER, and that the participant satisfaction and impact was to be analysed within largely the ambit of ROI/ROE. The framework relationship can be simply and clearly represented as follows (Figure 2):

Open Educational Resources	Online Learning	Return on Investment/ Expectation	IMPACT
• Accuracy • Relevance • Accessibility • Quality • Engagement/ interaction • Licensing	• Course design • Curriculum design • Ease of comprehension • Adequate content • Instructional design • Technology design • Assessment rubric	• Reaction • Learning • Behaviour • Results • Investment/ expectation	I M P A C T

Figure 2: Framework for evaluation

The goal was not only to evaluation the course offered through online learning, but also to evaluate the OER and OER-based course on OER. This was to be done within a framework of learner cost/value/productivity/satisfaction, i.e. the benefits they received in comparison to time and cost put in.

Research Questions

This evaluative study addressed four research questions:

1. What are the participant reactions to the quality of the 'online course' LearnOER?

2. What are the participant reactions to online course based on 'OER'?

[11]

3. To what extent the participants have been empowered by the course, and in what ways do they propose to use the gain in knowledge and skills in their own organization/ institution?

4. What are the institutional and participant costs of offer of the online course, and what benefits/ returns are derived in comparison to the costs involved?

The methodology was determined, the sample was drawn, and the survey instruments were prepared, as given in the next chapter, based on the above four questions, and the variables captured in Figure 1 and 2 above.

Chapter 2:

METHODOLOGY

Research Methodology

The present research is an evaluative study of the online course on OER (LearnOER) offered by COL. The methodology involved conducting an online survey of graduates of the online course, as also finding out a rough sense of return-on-investment (ROI) / return-on-expectations (ROE) by ascertaining the actual expenses by the participants, their perceived estimate of the value of the course certification if it is offered as a paid course, as also the money spent by the implementing agency, i.e. COL in the design, development and delivery of the online course, vis-à-vis the benefits derived by the graduates of the course and their actual implementation at their workplaces..

Population and Sample

The population for the evaluative study comprised of all those participants who had completed the course successfully. As of June 13, 2019, 4,079 users from 64 countries had registered (Table 1), of which, 1,419 had completed the online course.

Table 1: Countries and population

S. No.	Country	Total	S. No.	Country	Total	S. No.	Country	Total
1	Afghanistan	1	16	Germany	1	31	Maldives	2
2	Australia	3	17	Ghana	3	32	Malta	1
3	Bangladesh	26	18	Grenada	6	33	Mauritius	1
4	Barbados	2	19	Guyana	1	34	Mozambique	4
5	Belarus	1	20	Iceland	1	35	Namibia	4
6	Belgium	1	21	India	3651	36	Netherlands	1
7	Belize	1	22	Indonesia	1	37	New Zealand	3
8	Botswana	25	23	Iraq	1	38	Nigeria	35
9	Brazil	1	24	Italy	1	39	Oman	5
10	Burkina Faso	1	25	Jamaica	18	40	Pakistan	7
11	Canada	19	26	Kenya	76	41	Papua New Guinea	4
12	Colombia	1	27	Kiribati	1	42	Poland	1
13	Ethiopia	1	28	Lesotho	1	41	Papua New Guinea	4
14	Fiji	19	29	Malawi	1	42	Poland	1

15	France	2	30	Malaysia	36	43	Portugal	1
44	Rwanda	1	51	Swaziland	2	58	Ukraine	5
45	Saint Kitts and Nevis	1	52	Sweden	1	59	United Arab Emirates	1
46	Saint Lucia	1	53	Tanzania, United Republic of	10	60	United Kingdom	6
47	Saint Vincent and the Grenadines	4	54	Thailand	1	61	United States	11
48	Saudi Arabia	1	55	Trinidad and Tobago	15	62	Yemen	1
49	South Africa	7	56	Turkey	1	63	Zambia	24
50	Sri Lanka	1	57	Uganda	12	64	Zimbabwe	1
Grand Total								**4079**

The highest number was from India (3,651), followed by Kenya (76), Malaysia (36), Nigeria (35), Bangladesh (26), Botswana (25), and so on.

The background variables for the 4,079 registered participants are as follows:

Course Status	Total	%
Completed	1419	34.79
Failed	408	10.00
In-Progress	916	22.46
Not Started	1336	32.75
Grand Total	**4079**	
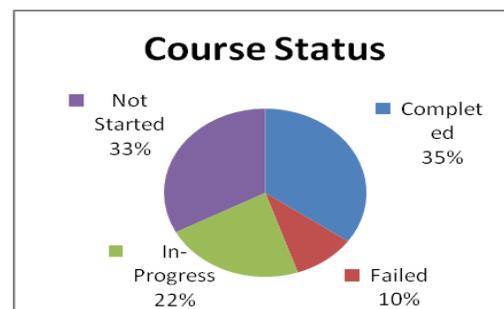
- Of the 4079 registered participants, 34.79% (N= 1419) completed the course successfully, and 22.46% are still continuing the course while 10% failed and 32.75% had not started the course till June 2019.

- There were more females (52.86%) than males.

- About 36.97% were in the age group 21-30, followed by 34.91% in 31-40 age group.

- The highest number of participants were from higher education institutions (64.80%), followed by schools (16.01%).

- About 51.95% were Masters degree holders, followed by Bachelors (24.22%) and Doctorate degree (19.59%).

All the 1419 course completers were contacted to complete an online survey comprising background variables, perception of various aspects of the online course and on OER, statements of various aspects of ROI, and a few open-ended questions for their overall feedback. A total of 127 complete responses was received (response rate= 9%) and put to analysis. All the

respondents had affirmed in positive to take part in the survey. The sample characteristics are given in Chapter 3 'Analysis and Results'.

Instruments

For conducting such an evaluative study, various literature on 'online course evaluation', 'evaluation of OER' and 'return on investment/ return on expectations' were reviewed (as given in the first chapter on 'Introduction'). Based on the best outcomes suitable to this research, one questionnaire was developed, comprising items on 'individual variables'; statements on perceptions of various aspects of the online course; experience on OER within the course with regard to the aspects of RoI/ RoE--'reaction', 'learning', and 'behaviour and impact'; questions on additional expenses incurred by the respondents for completing the online course, the dollar value they will assign for doing such a course (which was a free course), and the time/ cost savings they perceive in their own institution/ organization for OER-based activities; and open-ended questions on the most liked and the least liked aspects of the course, and the type of OER experience that they have had/ or are planning to be engaged with.

Additionally, the various costs involved by COL for design, development and delivery of the online course LearnOER were collected from the course administrators.

The questionnaire so developed was distributed to 10 international experts on online learning, OER, and educational costing. Based on the suggested modifications, the questionnaire was finalized and administered online to all the 1419 course completers. A copy of the final version of the questionnaire is given in *Appendix 1* at the end of this report.

Cost-Analysis Matrix

The matrix for Cost vis-à-vis ROI/ ROE may be represented as follows (Figure 3). This matrix has been used to reach the final analysis of ROI/ ROE for the online course Understanding OER given at the end of Chapter 3.
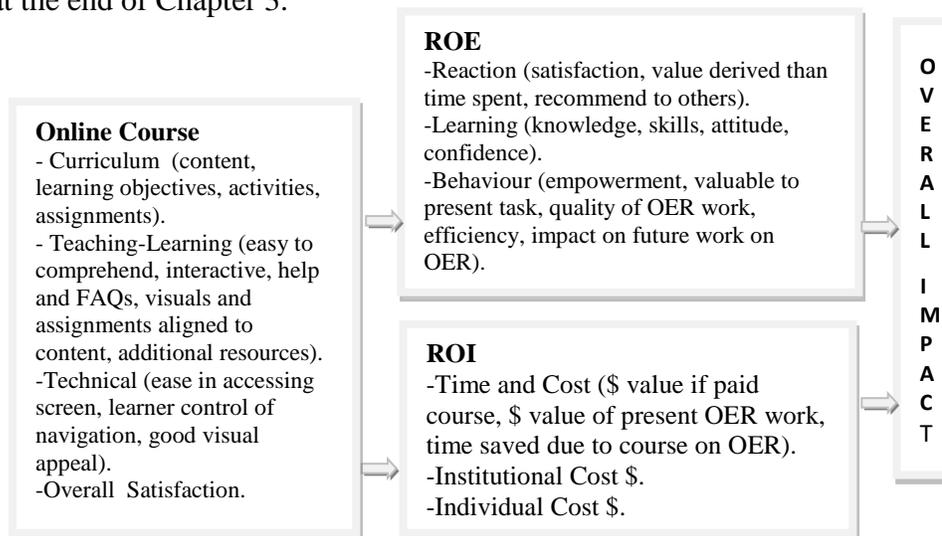

Figure 3: ROI/ ROE matrix

Chapter 3:

ANALYSIS AND FINDINGS

The collected data was analysed from three aspects: Online Course, OER, and ROI. These are analysed as follows.

Respondent Demographic Variables

The demographic and other characteristics of the rrspondents were as follows (Table 2):

Table 2: Demographic and other charateristics of respondents

Male: 57 (48%) Female: 61 (52%) Prefer not to disclose: 0 Skipped: 9	Below 20 yrs: 2 (2%) 20-30 yrs: 33 (28%) 31-40 yrs: 49 (41%) 41-50 yrs: 25 (21%) Above 50 yrs: 9 (8%) Skipped: 9	Elementary and Primary School: 6 (5%) Secondary and Higher Secondary School: 15 (13%) College and University: 87 (74%) Business and Industry: 3 (2%) Independent Consultant: 7 (6%) Any other: 5 Skipped: 9
Higher Secondary: 1 (1%) Diploma: 0 (0%) Bachelor Degree: 20 (17%) Masters Degree: 59 (50%) Doctoral Degree: 38 (32%) Others: 4 Skipped: 9	Country (Answered 118): India (93); Kenya (5); Nigeria (5); Trnidad & Tobago (4); Botswana (3); Zambia (2); Bangladesh (1); Fiji (1); Grenada (1); Jamaica (1); Mozambique (1); St Vincent & the Grenadines (1). Skipped: 9	

The demographic charateristics of 118 respondents, who filled up these items, are as follows.

- There were more females (52%) than males.

- There were more in 31-40 age group (41%), and 20-30 age group (28%) than others.

- The institutional affiliation was more from college and university (74%),followed by school (13%) than others.

- The highest qualification was more of masters degree (50%), followed by doctoral degree (32%) than others.

- The country of respondents was highest for India (92), followed by Kenya and Nigeria (5 each), Trnidad & Tobago (4), Botswana (3), Zambia (2), and one each from Bangladesh, Fiji, Grenada, Jamaica, Mozambique, and St Vincent & the Grenadines.

Online Learning

Though the average time given was two hours to complete, nearly 15% completed with less time, and about 52% took more time even up to three hours to complete the course (Table 3). As an average, it took about 135 minutes to complete the course successfully.

Table 3: Time taken for course completion

0<90 minutes	90 - 120 minutes	120 - 180 minutes	>180 minutes
18	38	28	34
15.25%	32.20%	23.73%	28.81%

While about 16% completed the course in first sitting, and about 12% in two sittings, nearly 14% completed the online course in 10 sittings (Table 4).

Table 4: Attempts for course completion

Attempt	1	2	3	4	5	6	7	8	9	10
Respondents	19	15	13	15	12	10	7	6	4	17
%	16.10	12.71	11.02	12.71	10.17	8.47	5.93	5.08	3.39	14.41

There were 18 statements on various aspects on the online course which were scored on a 5-point scale--5 for 'strongly agree' to 1 for 'strongly disagree'. The average values, statement-wise, are given in Table 5.

The following main results are derived from the responses:

- The highest score for the following aspects indicated very positive perception: course objectives, learning activities, and assignments; easy understanding of content; easy on-screen reading and viewing; technology design toward learner freedom/ control for handling and navigating content.

- Though very positive responses, the following aspects were given preference between 'SA and Agree': interactive exercises for practice; visual elements on the screen; location of FAQs and Help; options and alerts for easy navigation.

- Overall, all the respondents were highly satisfied with this online course (the average score being 4.54).

[17]

- The low standard deviations between 0.05 to 0.06 indicate symmetry among all the respondents to all the 18 statements on the perception of the online course.

In so far as the value of the course for the current tasks performed by the respondents, of the 92 respondents, nearly 73% found it very valuable and about 27% found it somewhat valuable (Figure 4).

Table 5: Average value on 18 statements on perception of the online course

| Sl. No.	Statements	Mean	SD
1	Description of course objectives, learning activities and assignments in the online course waer 'appropriate'.	4.58	0.056
2	The online course on OER enabled me to understand the topic well and easily.	4.51	0.056
3	Reading and/or viewing the contents on screen was easy and efficient.	4.49	0.059
4	The amount of content on screen was adequate and not overloading of information.	4.29	0.06
5	The learning contents on screen were presented logically and were connected to each other sequentially. / The instructional design was appropriate for this course.	4.38	0.062
6	The technology design provided me enough freedom to handle the content and navigations on my own.	4.43	0.057
7	After reading going through the online course, I am satisfied to have gained sufficient knowledge on OER.	4.34	0.061
8	The way the content was presented helped me to perform better in the final assessment.	4.35	0.056
9	The visual appeal of the LMS platform was very good.	4.34	0.057
10	The assessment tasks were fully aligned to the content of the course.	4.34	0.052
11	The interactive exercises in the online course helped me to undertake practice and learn from them.	4.29	0.054
12	I quickly and easily performed the tasks on interactive screens.	4.27	0.058
13	The visual elements used were not distracting from learning on screen.	4.24	0.055
14	The 'Help' and 'FAQs' provided in the online course were easy to locate and understand.	4.26	0.06
15	The system gave options and alerts to rectify mistakes while navigating through the course.	4.21	0.057
16	The structure and navigation of the course was clear and easy to follow.	4.38	0.052
17	The additional resources provided were very useful to my understanding and skill development.	4.39	0.056
18	Overall, I am satisfied with this online course and will take more such courses, if available.	4.54	0.054
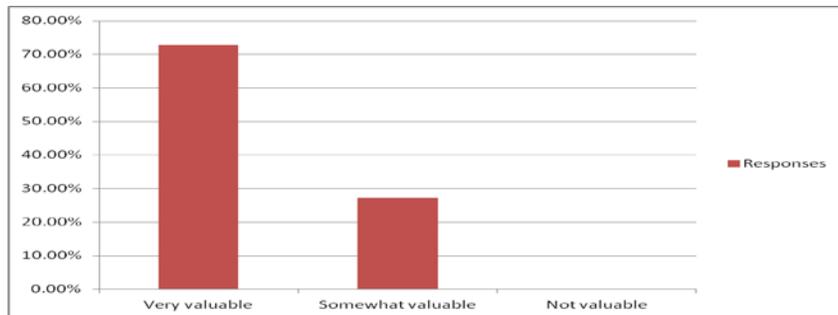
Figure 4: Value of the online course

The best aspects of the online course liked by the participants

The following are important aspects of the online course appreciated by the particiapnts. These were frequently mentioned by 92 respondents (though not in rank order):

- Licensing and IP knowledge vis-à-vis CC were very useful

- Additional resouces on OER were very useful.

- The course and especially the tutorials were very interactive.

- The course provided useful learning experiences to be applied in one's own context.

- There was flexibility to move at one's own pace.

- The typesof assignments were very educative.

- There was more gain in knowledge and skills in a short time.

- The online platform was easy to handle.

- The course design and course structure were excellent and very educative.

- There was appropriate technological configuration.

- There was sufficient skill development on OER design and adoption.

- The video lectures were very educative.

- The planning and execution of the online course well done.

- The certification and recognition from an international organisation is appreciated.

Aspects of the online course liked least by the participants

The following are aspects of the online course that were liked least by the particiapnts. These were mentioned by 92 respondents (though not in rank order):

- More and varied examples of OER was needed.

- More clarity on instructions for the 'games' designed in-between the courses is needed.

[19]

- There were too many textual reading materials. Also it will be useful if these are appropriately linked to respective section/ video of the course. It may be noted that a few respondents underlined that the course content was too brief and needed further expansion.
- The pass mark of 80% for assessments was a bit on the higher side.
- The courses needed to be a bit more interactive.
- The linkage between content and assessment/ exam needed to be clearly established.
- Answers to some of the assessments were absent; these may be given to obtain immediate feedback.
- It will be more useful if the video contents are given with sub-titles in English. Also, more useful if the transcripts of video presetations are provided for reading in future.
- The recognition of the certification needs further clarification.

The follwing general comments/ suggestions were given by 60 respondents (and 67 skipped the question).

- 'It was great work. Looking forward to see such online courses increasing in number'.
- 'The participants must undergo this course twice'.
- Very informative and a must for any educator'.
- 'It is a must do course for university faculties'.
- 'A good exposure in an easy and simple way. Every teacher should know these details'.
- 'Please provide similar courses on regular basis'.
- 'Bring another similar course that is a little more advanced. And arrange for sponsorship'.

Open Educational Resources

Except one respondent, nearly 97.83% of respondents (N=90) expressed that they will be too willing to recommend this online course to others interested in OER and its implementation (Figure 5).
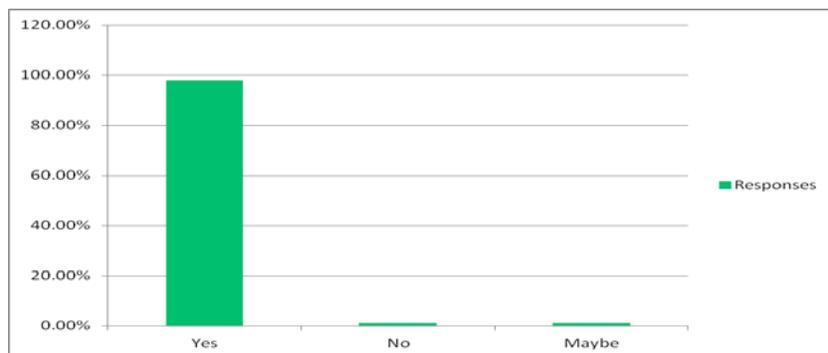

Figure 5: Recommendation of OER to others

Nearly 96.59% of respondents pointed out that they derived more value from the course than the amount of time they spent to go through and successfully complete the course (Figure 6).
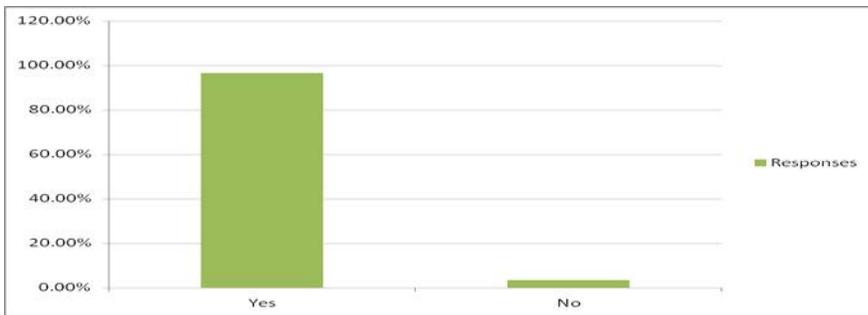

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Figure 6: Value obtained vs time spent

Return on Investment/ Return on Expectations

ROI/ ROE was studied from the viewpoints of any improvement in efficiency and quality of their OER work; if the course empowered them to do OER activities; the value of the course if it was a paid course; the improvement in the value of their current OER work; saving of time in their OER work after completion of this course; and if any additional expenses they had to incur to go through and complete this online course. Their responses are analysed as follows (Figure 7). Nearly 78% were very satisfied with the course, while about 22% were somewhat satisfied with the online course.
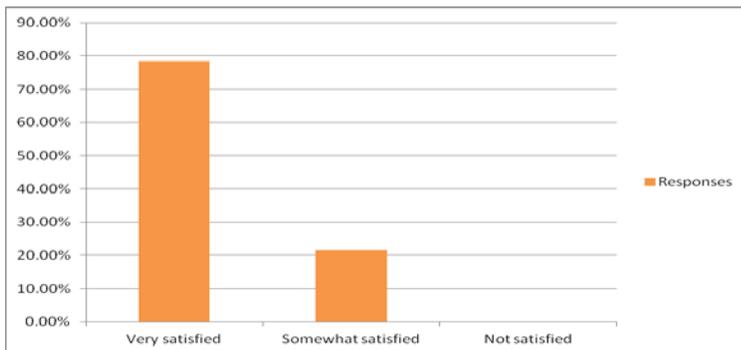
Figure 7: Course satisfaction

The most important question was to what extent the online course LearnOER contributed to the knowledge, skills and attitude of the participants.

- Nearly 64% reported the course to have increased their 'knowledge' to a large extent.

- In so far as 'skills' was concerned, nearly 42% reported increase to a large extent.

- The effect on their attitude toward OER was such that nearly 56% reported an effect to a large extent, while about 41% reported the effect to some extent (Figure 8).

[21]

Figure 8: Enhancement in knowledge, skills, attitude

In nearly 70% of the respondents, the online course enhanced their 'confidence' to a large extent (Figure 9).

Figure 9: Confidence in using OER

Of those responded (N=88), about 71.59% were involved in creation or adaption of OER in their current work (Figure 10).
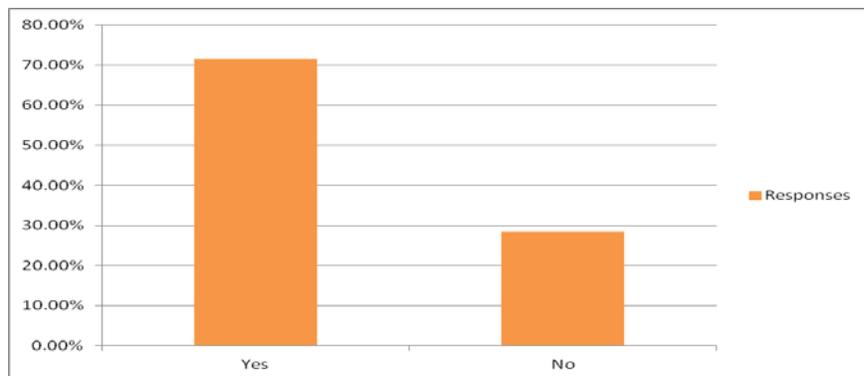
Figure 10: Involvement in OER use

Those who are involved in OER work further described the nature of their work as follows.
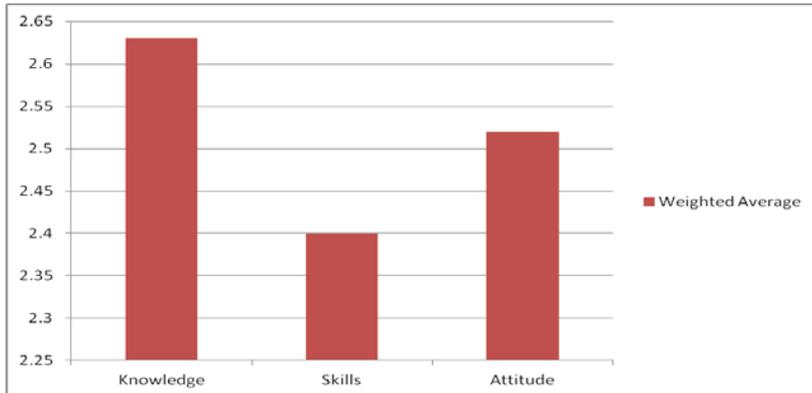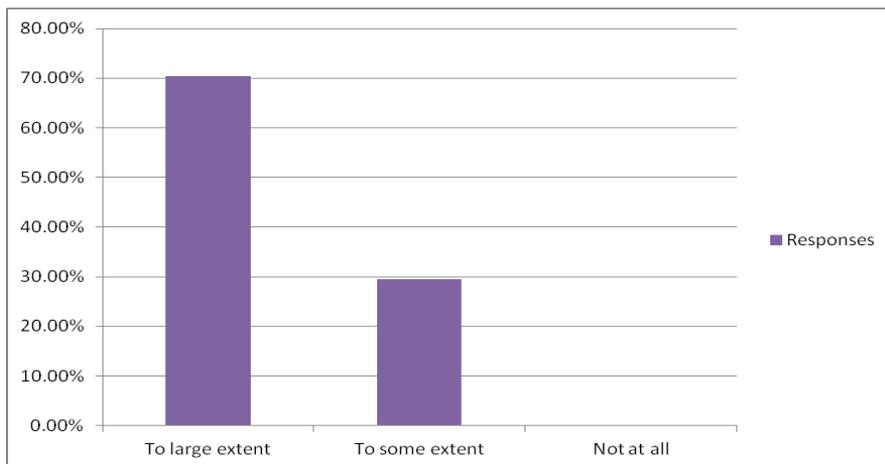
- Development of modules: fashion design, and other certificate and diploma programmes.
- Development of online course: OER-based e-modules.
- Offline course development like BCom Accountancy.
- Development and adapation of OER assignments.
- Design of flipped learning.
- Development/ improvement in OER repositories: like NROER (NCERT), virtual library, NSOU-OER repository.
- OER integration in teaching-learning, like at IIT-Bombay.
- Teacher education: Micro-teaching, nano teaching to enhance teaching skills, models of teaching, education theatre and theatre pedagogy, blended courses for student-teachers.
- Research on ODL and research papers as OER.
- You Tube use like Bhatt Alpesh, and other educational videos.
- Prtomoting OER in schools.
- Development MOOC courses.
- Planning to develop OER awareness online courses.
- TVET: awareness and information, courses on TVET.
- OER-based training: workshops, presentations, senior management training.

On the question on improvement of 'efficiency' of their OER work, 42.37% respondents noted 'highly increased', 50.85% 'moderately improved', and 5.08% 'little improvement'; only one respondent expreseed 'no improvement' in their OER work due to the online course completion (Figure 11).

[23]
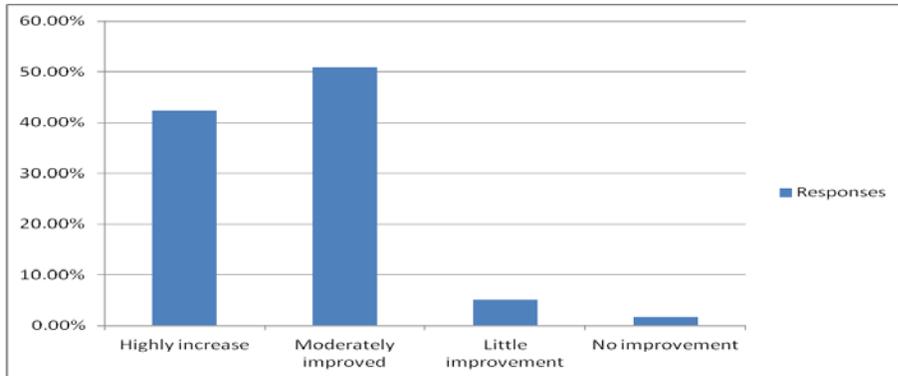
Figure 11: Increase in efficiency

On the question if at all the completion of the online course has improved the 'quality' of their OER work, 49.15% reported 'highly improved', while 40.68% reported it has 'moderately improved' their OER work. Though no improvement was reported by none, little improvement was rep[orted by 10.17% respondents (Figure 12).
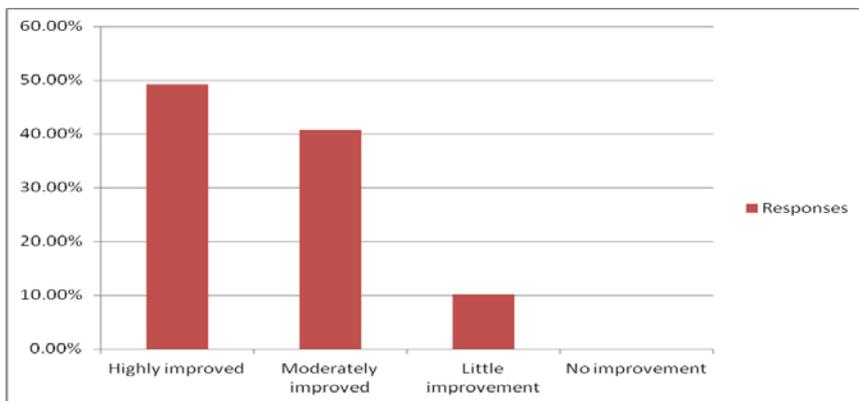
Figure 12: Improvement in quality of OER activities
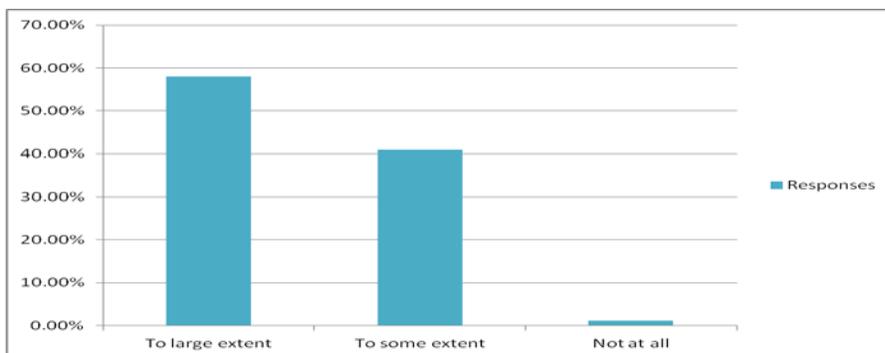
Figure 13: Empowerment to develop OER

[24]

On the question if at all the online course completion will *impact in their future work* in their institution/ organisation, the follwing consolidated responses are in order (N=64 responded, 63 skipped the question). Barring 2 respondents, 64 of them reported that the online course will further impact the current and planned activities of their organisation positively. The activities include the following.

- Online course development and mentoring support to colleagues.

- Increase in knowledge and skills in OER, and so can plan to use OER in future.

- Confidence development: Feel more confident to engage in OER-related activities within the organisation.

- Development of courses on own MOODLE for current and future students.

- Will enhance the quality of teaching with OER and therefore will increase student enrolment.

- More exposure is needed to perfectly using OER for various activities, but for sure, OER is going to be integral part of my/our activities.

- Wish that their institutions go for OER so they can be part of leading the initiative of OER integration.

- For sure, by self and for students, will guide about copyright issues. One of them wrote: 'I have made up my mind not to use in my class data on the Internet which have copyright issues'.

- Another wrote: 'I need more exposure to OER as it is relatively new to me, but I can see it being part of my work'.

- One more: 'Dissemination and value addition to my students and colleagues'.

- Another: 'All the programmes are going to be online. Expectation is that all faculty memebers get knowledge and skill on OER'.

- Another respondent: 'There is always resistence to change. But my organisation already took a bold step by sharing materials with learners'.

The online course LearnOER was offered by COL free of charge to the participants. However, it was ascertained about the participants; estimate of cost/ fees if offered as a paid course, their individual additional costs for going through this course, and also the institutional costs involved in designing, developing and delivering the online course.

If the course was to be offered as a paid course, nearly 52% respondents estimated it to be US$50, and nearly 10% reported the fees to be US$200. The average cost suggested is calculated to be about US$85 if fees is to be charged from the participants (Table 6).

Table 6: Dollar value if available as paid course

Answer Choices	Responses		Total
USD 50	52.17%	48	2400
USD 75	11.96%	11	825
USD 100	17.39%	16	1600
USD 125	2.17%	2	250
USD 150	5.43%	5	750
USD 175	1.09%	1	175
USD 200	9.78%	9	1800
	Answered	**92**	Total 7800
	Skipped	**35**	Average **$ 84.78**

On the question 'If the value of your previous OER work was x dollar, how will you rate the value of your current OER work after completing the online course?', nearly 22% reported 75-100% increase, and about 16% reported up to 25% increase. The responses were converted into US$ terms by assuming the previous OER work as zero $, and by taking the average mid-point for each category of four types of responses on increase in $ value. The average increase turns out to be about US$ 51 (the highest being US$ 88, and lowest as US$ 11) (Table 7).

Table 7: Dollar value of new OER activities over old OER activities

Answer	Responses		Average/ Mid-point	Total increase
75 - 100% increase	22.41%	13	87.5	1137.5
50 - 75% increase	34.48%	20	62.5	1250
25 - 50% increase	20.69%	12	37.5	450
Up to 25% increase	15.52%	9	12.5	112.5
No increase	6.90%	4		
	Answered	**58**	**Total increase US$ 2950**	Average increase US$ 50.86

In case of resource-based learning, saving of time due to use of OER is an important criterion to examine the impact of the online course on OER, since saved time is money saved. While about 12% reported saving of 1 hour per week, above 5% reported 10 hours of saving per week, though the highest was 27% respondents noting a saving of about 5 hours per week (Table 8).

Table 8: Time saving in current work due to LearnOER

Hours	1	2	3	4	5	6	7	8	9	10	Grand Total
Respondents	7	3	2	8	15	3	4	6	4	3	55
%	12.73	5.45	3.64	14.55	27.27	5.45	7.27	10.91	7.27	5.45	**Average =5.2 hrs**

The respondents were asked, even if this was a free course, if at all they incurred any 'individual additional expenses', and under what heads. Only 9 responses were received on this question (and the rest did not incur any additional expenses). While one of them reported to have spent $200 for printing of course materials/ additional resources, two of them noted to have spent $ 10-25 on internet, one spent $25 for generator, two noted $50 each (without any listing of items), and one noted spending some money for network prepaid card (Table 9).

Table 9: Individual additional expenses while doing the course

US$	Heads	Responses
	Network prepaid card.	1
	The amounts used for internet connections during the process of studies.	1
200	Printing US$ 200 Internet US$ 10.	1
20	20$ for internet.	1
25	Extra cost in generator fuelling and network provision possibly to the tune of $25.	1
50	Approximately US$ 50.	1
50	50$	1
10	10$	1
1	1	1

In so far as 'institutional cost' by COL was concerned, the following were the heads of expenses:

1) Content Development Cost: CAD5,700
2) Interactive course: CAD14, 175
3) Platform Development Cost: CAD12,250
4) Maintenance Cost: CAD 8,400
5) Staff Time (about 10% of the total cost): CAD4,052

The total cost comes to be about CAD 44,577 (US$ 33,974.10). If this is divided by the total registered participants, the unit cost of registered participants works out to be CAD10.92 (US$ 8.32). If the total cost is divided by the total pass-out participants, the unit cost of pass-outs/ graduates comes to be CAD31.41 (US$ 23.94) which is much less than the unit cost if the course was to be offered as a paid course US$ 84.78).

Further cross-examination of data was undertaken between 'increase in $ value of present work' on one hand, and 'course satisfaction', 'knowledge gain', 'skill gain', and 'attitude gain' on the other (Tables 10, 11, 12).

Among those who were very satisfied with the online course, nearly 65% reported an increase up to 50% in the $ value of their current OER teaching-learning/ training activities due to the knowledge, skills and attitude gained through the online course. Further, about 17% reported an increase of 51-100% in the $ value of their current work. This is a very crucial impact of LearnOER, and which supports a high ROI and ROE for this online course.

The matching between 'increase in $ value of present work' and 'knowledge, attitude and skills' is presented in Tables 11-13, and the findings suggest some relationship between them.

Table 10: Those who responded to dollar value # Course satisfaction (N = 58)

Course satisfaction	Dollar value of new OER activities									
	75-100%		50-75%		25-50%		0-25%		No	
Very Satisfied	2	3.45%	8	13.79%	7	12.07%	31	53.45%	0	0.00%
Somehow Satisfied	2	3.45%	2	3.45%	5	8.62%	2	3.45%	0	0.00%

* 107 had responded to satisfaction question

Table 11: Those who responded to dollar value # Knowledge gain (N = 58)

Knowledge	75-100%		50-75%		25-50%		0-25%		No	
To Large extent										
To some extent	1	1.72	7	12.07	5	8.62	3	5.17	2	3.45
Not at all	12	20.69	13	22.41	7	12.07	6	10.34	2	3.45

* 88 had responded to Knowledge question

Table 12: Those who responded to dollar value # Skills gain (N = 58)

Skills	75-100%		50-75%		25-50%		0-25%		No	
To large extent									1	1.72
To some extent	6	10.34	9	15.52	10	17.24	6	10.34	2	3.45
Not at all	7	12.07	11	18.97	2	3.45	3	5.17	1	1.72

* 88 had responded to Skills question

Table 13: Those who responded to dollar value # Attitude gain (N = 58)

Attitude	75-100%		50-75%		25-50%		0-25%		No	
To large extent	1	1.72					1	1.72		
To some extent	3	5.17	6	10.34	7	12.07	4	6.90	3	5.17
Not at all	9	15.52	14	24.14	5	8.62	4	6.90	1	1.72

* 88 responded to Attitude

Return on Investment Calculation

Using the formula discussed in Chapter 1,

$$ROI = \frac{\text{Net project/programme benefits}}{\text{Project/Programme costs}} \times 100$$

[28]

To calculate the ROI for the LearnOER, we used the cost data provided by COL. The total programme cost was CAD 44,577 (equivalent to USD 33,974.10). This programme cost per unit for successful participants resulted in US$ 23.92. The unit $ benefit accrued to the participants, if this was a paid course, was calculated at US$ 84.78. Assuming this was the unit $ benefit for all the 1,419 successful participants, the total benefit comes to US$ 120,302 which yields a ROI of 354.09. Further, considering an increase in the value of current OER work of US$ 50.86 per unit (i.e. $72,170.34 in total) for all 1,419 successful participants vis-à-vis the money spent by COL (i.e. US$ 33,974.10) yields a ROI of 212.42% for LearnOER.

In the final analysis on ROI/ ROE, the overall collated indicators for: the online course; ROE for 'reaction', 'learning' and 'behaviour'; and ROI for time saving, cost saving, and individual and institutional unit costs are captured in Figure 14. The results indicate very high satisfaction and increase in knowledge, attitude and skills as well as reasonable time and cost saving, while the individual unit cost was negligible and the institutional unit cost was very low at US$23.92. While the LearnOER course has resulted in 212.42% ROI from the perspective of the benefits accrued to the learners, the ROI for COL is 254.1% based on the cost involved so far in offering the LearnOER and the average value of the course estimated by the learners. The overall ROI/ROE can be considered as a very good investment made by COL to justify value for money.

Online Course

- *Curriculum*

(content, learning objectives, activities, assignments: 4.58/5).

- *Teaching-Learning*

(easy to comprehend: 4.51/5; interactive: 4.29/5; help and FAQs: 4.26/5; visuals and assignments aligned to content: 4.34/5; additional resources: 4.39/5).

-*Technical*

(ease in accessing screen: 4.49/5; learner control of navigation: 4.43/5; good visual appeal: 4.34/5).

-*Overall Satisfaction:* 4.54/5.

ROE

-*Reaction*

(satisfaction: 78%; value derived than time spent: 97%; recommend to others: 98%).

-*Learning*

(knowledge: 64%; skills: 42%; attitude: 56%; confidence: 70%).

-*Behaviour*

(empowerment: 58%; valuable to present task: 73%; quality of OER work: 49%; efficiency: 42%; impact on future work on OER).

ROI

-*Time and Cost*
($ value if paid course: US$85; $ value of present OER work: US$51; time saved due to course on OER: 5.2 hours per week).

-*Institutional Cost* $: US$23.92 per unit.

-*Individual Cost*: Negligible.
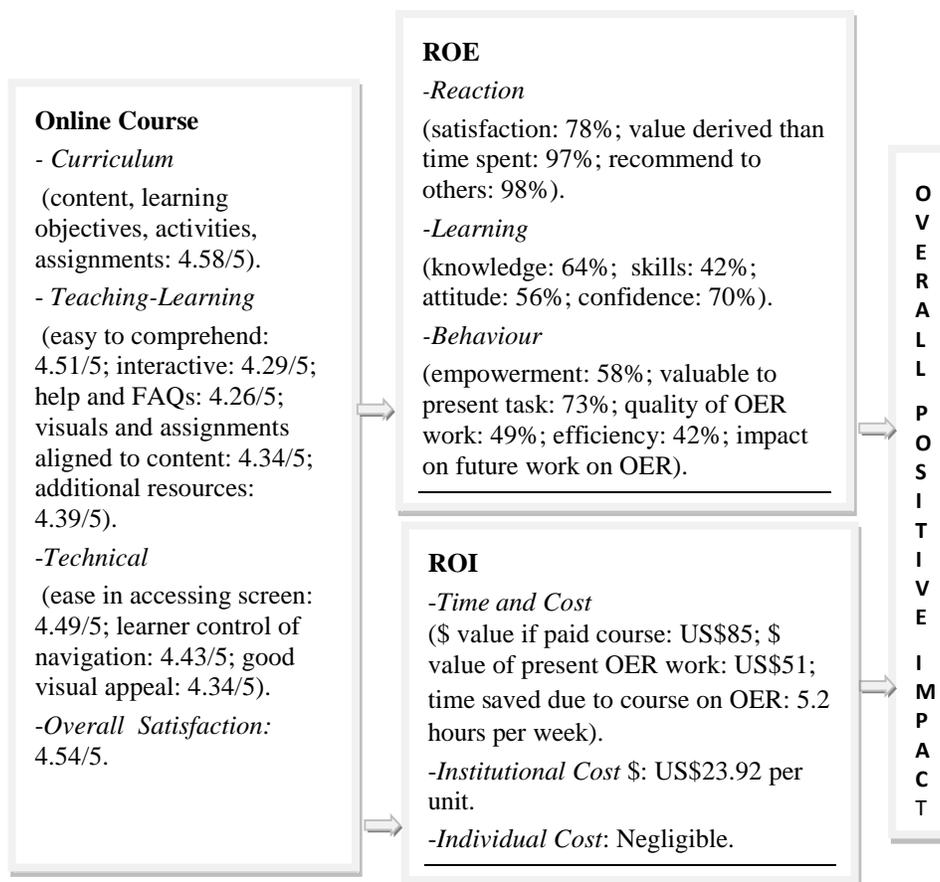
OVERALL POSITIVE IMPACT

Figure 14: Overall ROI/ROE matrix results/ impact

[29]

Chapter 4:

IMPLICATIONS

The findings of the study suggest clearly that the online course on OER (LearnOER) has been a successful OER-based online course, contributing significantly to capacity building of various stakeholders, including institutional faculty, in understanding and adopting/using OER in teaching-learning, training, lifelong learning, and community development. Further, as suggested by Ehlers (2011), this has potentiality to go further from open content to open practice.

More specifically, the analysis of data suggests the following main findings:

- The curricular aspects of the online course relating to learning objectives, content structure, learning activities and assignments were highly appreciated by the participants.

- There was high appreciation for teaching-learning aspects, especially interactions, help and FAQs, alignment of visuals and assignments to course content, and additional resources.

- The respondents were highly satisfied with the technical aspects of the course.

- The overall satisfaction was very high at 4.54 out of a score of 5.

- As an average, it took about 135 minutes to complete the course successfully. On the other hand, after completion of the course, the participants are able to save, on an average, about 5 hours per week in their OER activities.

- Most participants reported to have derived more value than time spent on the course; gained high knowledge, skills and attitude; felt very empowered and confident in undertaking more OER activities in current and future work; and will be glad to recommend LearnOER to others to go through.

- The online course contributed reasonable ROI/ ROE and significant impact on the current and future work of most of the participants who are involved in teaching, training, business activities, and independent consultants.

- The institutional unit cost for the course was very low at CAD31 for successful participants, and individual unit cost was very negligible and was incurred by only 9 participants.

- When we consider the average programme unit cost by COL along with the average programme benefit unit cost of LearnOER, the estimated ROI results in 212.42 which is highly satisfactory. Further, if the cost saving due to this being a free course is considered, the ROI is estimated to be 354.09. This, alongside the intangible benefits for Return-on-Expectations which is very satisfactory, could be considered as long-term investment in human resources for OER.

- The participants have suggested further to continue offer of LearnOER with minor revisions; offer of next level online course on OER in a modular fashion, and networking of the successful participants/ graduate for further collaboration and their engagement in advocacy and offer of further training on OER and related aspects.

The COL has positioned LearnOER within its TEL initiative which is to expand in future within the larger framework of open education and open educational practices. A concerted progression toward viewing OER as an essential element of any education and training eco-system leads further to be part of as also support open education and open learning as larger goal of curriculum and pedagogy (Butcher et al, 2015). Use of OER and OEP in education and training and for lifelong learning may also address some of the principles of open education/open learning: learner-centeredness, independent and critical thinking, credit accumulation and flexible learning. The authors suggest nine skills required to effectively adopt OER policies and practices: advocacy, legal expertise, development of business models, course design and development, technology expertise, management of networks and consortia, monitoring and evaluation curation and sharing, and research and communication skills. Several studies indicate the reasons for slow adoption of OER in different parts of the globe. The foremost of those include lack of: awareness (Samzugi & Mwinyimbegu, 2013; Rolfe, 2012), appropriate and quality OER (Abeywardena et al, 2012; Clements & Pawloski, 2012; Chen & Panda, 2012), legal provision including copyright policy (Mtebe & Raisamo, 2014; Fitzgerald & Hashim, 2012), institutional policy and recognition (Jhangiani et al, 2016; Panda & Santosh, 2017), faculty motivation (Cox, 2016; McGill et al, 2013; Santosh & Panda, 2016), infrastructural facilities (Australian Government, 2016; Ngimwa, 2010), spare time due to faculty workload (Allen & Seaman, 2014), technology competency (Lesko, 2013; Wolfenden et al, 2012), knowledge about practice of learning design (Australian Government, 2016), and student awareness of OER use by faculty not as abrogating responsibility (Australian Government, 2016).

In an earlier keynote, Kanwar (2012) underlined one important survey finding from 13 Asian countries: 'Teachers felt they did not have either the time or the capacity to locate, adapt, and re-purpose OER material relevant to their work' (p.4); and this clearly indicates the need for seamless, massive and continuous training/ capacity building on OERs and OEPs, especially in the developing countries.

Though it needs further intensive follow-up of what the graduates of the online course on OER (LearnOER) are doing and shall be doing with OER, the recommendations of COL, based on six regional consultations towards the 2nd COL-UNESCO world OER Congress (COL, 2017a), shall continue to be the guiding force for institutions and faculty to practically blend OER into their education and training programmes.

The institutions are required to:

- Develop and implement an institutional OER policy.
- Create institutional mechanisms for OER quality assurance.
- Recognise faculty contribution to OER.
- Institute an award for best OER.
- Create an institutional repository for OER.
- Regularly organize capacity-building programmes for teachers.
- Conduct and support research on OER.
- Collaborate with other institutions to avoid reinventing the wheel.
- Take steps to improve the institution's ICT infrastructure.
- Develop accessible OER. (pp. 7-8)

The faculty could:

- Commit to develop personal skills for using OER.
- Collaborate with peers to develop OER.
- Help learners find and use OER appropriately.
- Engage in the creation and repurposing of OER.
- Ask retired teachers to create OER.
- Be a change agent.
- Evaluate the quality of OER.
- Curate and create portals for OER. (pp. 11-12)

The recent international survey, covering 102 governments and 759 individual stakeholders responses, suggested some OER related skills at low level (COL, 2017b): understanding the licensing system, remixing different OERs, understanding copyrights, and mechanisms to distribute OER to students. Further, almost 59% of respondent countries did not have firm national policies on OER. Since 'individual' depends on 'institutional', and institutional depends on 'national policies and initiatives', the graduates of the course LearnOER could network themselves and put in sufficient visible advocacies with governments, academic institutions and other stakeholders to move toward digitization, open education, and more of resource-based learning (RBL) in which OER could play a major role. The recommendation of COL appropriately has been for a two-fold approach: bottom-up approach starting from institutional and faculty level, and national strategic policy initiative to complement the bottom-up initiatives (COL, 2017b, p. 57). This is further corroborated by OECD (Orr et al, 2015) which suggests, in respect of teachers' professional development, that collaboration around production and application of OER is needed; that since teachers are generally reluctant to share in open networks (Santosh & Panda, 2016), a change in community culture is necessary along with more strategic and reflective (rather than just-in-time) integration of OER into course design; and that professional communities of practice need to chip in as most significant arbiter of negotiation of professional practices to support teachers in this culture of OER adoption and culture of sharing.

Costs can be reduced by adopting OER and sharing, and by subsequent updating at lower cost. It has been pointed out that the initial production costs for OER may be the same or even higher than the proprietary textbooks, the unit cost gets reduced below break-even only when there is wider distribution as also enhancement in the life cycle of OER (Orr et al, 2015). However, as reported by some researchers, cost savings are enormous in case of use of OER in place of college textbooks. In an 8-college study in the United States, Hilton III et al (2014) reported significant cost savings by students, further arguing that this also saved taxpayers' money in terms of funding of grants and student loans. In especially the developing countries where public funding for education has been gradually reduced and where the respective institutional faculty could not produce good quality learning resources, OER has the potential to contribute to enhancing affordability to high quality open learning resources. Professional development toward awareness, skilling and a culture of sharing hold the key. LearnOER is a major initiative toward that direction and should continue to modularly flourish and get into network-based global practice in future.

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APPENDIX 1:
Open Educational Resources
COURSE COMPLETION SURVEY

Dear Sir/Madam,

Congratulations to you for successfully completing the online course on "Understanding Open Educational Resources".

We will be grateful to you, if you can spare some time to provide your feedback about your experience, and how you ae using the knowledge gained from this course.

Kindly click on the survey link at:

This will be active up to:

Kindly note that the data gathered from the survey will be used in aggregate form for our monitoring and evaluation purposes, and to prepare knowledge resources that will be further used to improve the course offering to the next cohorts.

Your support in completing the survey is highly solicited your responses will be kept strictly confidential.

With regards,

Learn OER Team, COL

Section 1: Background Information

1. I agree to participate in this study. Yes ☐ No ☐
2. Sex: Male ☐ Female ☐ Prefer not to disclose ☐
3. Age Group: Below 20 years ☐ 20-30 years ☐ 31-40 years ☐ 41-50 years ☐ Above 50 years ☐
4. Affiliation: Elementary and Primary School ☐ Secondary and Higher Secondary School ☐ College and University ☐ Business and Industry ☐ Independent Consultant ☐ Others ☐
5. Highest Qualification: Higher Secondary ☐ Diploma ☐ Bachelor Degree ☐ Masters Degree ☐ Doctoral Degree ☐ Others ☐
6. Country:
7. Approximate time taken to complete the course: <90 min ☐ 90-120 min ☐ 120-180 min ☐ More than 180 minutes ☐
8. Number of sittings/ sessions you took to complete the course: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

Section 2: Feedback on the course

1. Express your agreement to the following statements in relation to the Online OER course taken by you.

Statements	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Description of course objectives, learning activities and assignments in the online course was 'appropriate'.					
The online course on OER enabled me to understand the topic well and easily.					
Reading and/or viewing the contents on screen was easy and efficient.					
The amount of content on screen was adequate and not overloading of information.					
The learning contents on screen were presented logically and were connected to each other sequentially.					
The technology design provided me enough freedom to handle the content and navigations on my own.					
After reading/ going through the online course, I am satisfied to have gained sufficient knowledge on OER.					
The way the content was presented helped me to perform better in the final assessment.					
The visual appeal of the LMS platform was very good. The assessment tasks were fully aligned to the content of the course. The interactive exercises in the online course helped me to undertake practice and learn from them.					
I quickly and easily performed the tasks on interactive screens.					
The visual elements used were not distracting from learning on screen.					
The 'Help' and 'FAQs' provided in the online course were easy to locate and understand.					
The system gave options and alerts to rectify mistakes while navigating through the course.					
The structure and navigation of the course was clear and easy to follow.					
The additional resources provided were very useful to my understanding and skill development.					

Overall, I am satisfied with this online course and will take more such courses, if available.					

2. Will you recommend this online course to others interested in open educational resources? Yes ☐ No ☐ May be ☐

3. What did you like best about this online course?

_____

_____

4. What did you like least about this online course?

_____

_____

5. How valuable are the contents of this course to the tasks you perform?

   Very valuable ☐ Some value ☐ No value ☐

6. What dollar value you will put to this free course, if available as a paid course?: 50 USD ☐ 75 USD ☐ 100 USD ☐ 125 USD ☐ 150 USD ☐ 175 USD ☐ 200 USD ☐

Section 3: Experience of OER

i) Reaction:

7. How much satisfied are you after going through this course?

   Very satisfied ☐ Somehow satisfied ☐ Not satisfied ☐

8. Did you get more 'value' from this course than the 'time' you spent on going through this course? Yes ☐ No ☐

ii) Learning:

9. To what extent this course has increased/ changed your:

   Knowledge: To large extent ☐ To some extent ☐ Not at all ☐

   Skills: To large extent ☐ To some extent ☐ Not at all ☐

   Attitude: To large extent ☐ To some extent ☐ Not at all ☐

10. To what extent has this course enhanced your confidence to undertake similar activities in your organization? To large extent ☐ To some extent ☐ Not at all ☐

iii) Behaviour and Impact:

11. Even if you are not involved in OER creation, has this course completion empowered you to develop OERs for education and training in future?

   To large extent ☐ To some extent ☐ Not at all ☐

12. Are you involved in creation or adaption of OER in your current work? Yes ☐ No ☐

13. Has completion of this course improved the quality of your OER work?

Highly improved ☐ Moderately improved ☐ Little improvement ☐ No improvement ☐

14. If the value of your previous OER work was x US Dollar, how will you rate the value of your OER work after completing the online course?

75-100% increase ☐   50-75% increase ☐ 25-50% increase ☐ Up to 25% increase ☐   No increase ☐

15. Has the online course helped you to improve efficiency in your OER work?

Highly increased ☐ Moderately improved ☐ Little improvement ☐ No improvement ☐

16. What is the estimate of your time saving that you can attribute due to this online course? Saving of none-10 hours per week (put a tick mark as appropriate):

No saving	1 hour saving	2 hours saving	3 hours saving	4 hours saving	5 hours saving	6 hours saving	7 hours saving	8 hours saving	9 hours saving	10 hours saving	More than 10 hours

17. Give description of some of your OER work (examples only to illustrate your work)

_____

_____

18. How do you visualize if at all this course completion will impact your 'future' work in your organization?

_____

_____

Section 4: General Comments

1.   Your general comments/ suggestions on the online course on OER:

_____

_____

2.   Did you incur any additional expenses while going through this course? Yes☐ No☐

If 'yes', can you provide the heads and expenditure incurred under each head in US$ term:

Thank you for taking the survey.