From OER to OEP: shifting practitioner perspectives and practices with innovative learning experience design

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Abstract

Like any other educational resource, the integration of OER in teaching and learning requires careful thought and support for the teaching staff. The Faculty of Education at the Open University of Sri Lanka approached this challenge with the help of a professional development course on OER-based e-Learning. Modules in the course incorporated the use of authentic learning scenarios with learning tasks that facilitated capacity building in a collaborative manner. This paper reports the impact of this course in shifting their perspectives and practices in relation to open educational practices. In addition to a much richer grasp of conceptual knowledge and skills related to searching, identifying, evaluating and integrating OER, participants developed competencies in designing, developing and implementation of an OER-based e-Learning course.

Keywords: Open Educational Resources; Open Educational Practices; Learning Experience Design; Professional Development

Introduction

Open Educational Resources (OER) are rapidly gaining momentum in education systems worldwide. While the use of OER serves as an effective strategy to address access and cost related issues in higher education, there are still many gaps within the Asian academic community in the adoption of OER (Dhanarajan & Abeywardena, 2013; Hatakka, 2009).
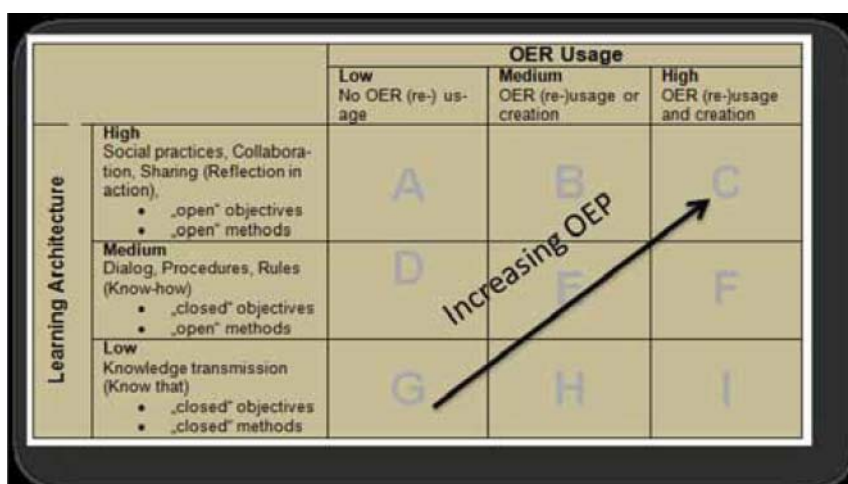
While advocacy is essential, building capacity in the integration of OER is equally important. Why and how OER can make any difference to teaching and learning, as opposed to any other learning resource is a matter of great interest. There needs to be a focus on innovative open educational practices and on OER-based e-Learning (Ehlers, 2011). The Open University of Sri Lanka (OUSL) implemented a professional development course on OER-based e-Learning (OEReL), adapted from a course developed with the support from Commonwealth Educational Media Centre for Asia (CEMCA). A key focus in this course was to take a whole course approach to capacity building in OER integration, as opposed to a piecemeal approach of intermittent workshops which are typical.

This course consists of five modules—Concept and Practices of OER; Search and Evaluation of OER Materials; Licensing and Copyrights; Designing Learning Experiences for OER-based e-Learning and Integrating OER in e-Learning. These five modules are very practice-oriented and designed to be of immediate help to the educators in their point of need. The course design incorporates the use of authentic learning scenarios, peer-based collaborative and cooperative learning, and reflective practice. This paper reports the impacts of this course for educators and their capacity development in integrating OER in their teaching.

Conceptual framework

While efficient integration of OER is supported by ICT, effective use of OER in teaching and learning can only be enhanced through the adoption of a systematic course design process. Educators have the primary responsibility for finding and integrating appropriate OER materials in the teaching-learning process (COL, 2011).
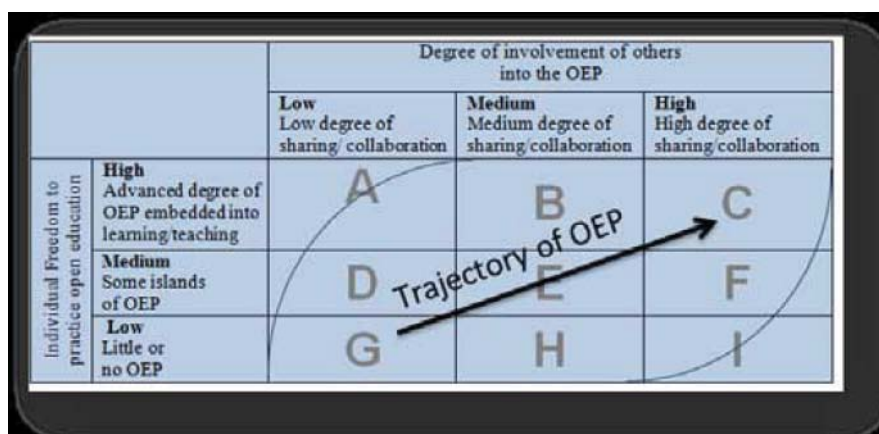
According to the 4R Framework of OER – Reuse; Revise; Remix and Redistribute (Wiley & Green, 2012) users are permitted not only free use of materials, but also the ability for re-purposing them through improvement and creation of new materials, as well as innovative teaching practices using OER. This focus on OER extends beyond mere 'access' to engagement in 'innovative open educational practices' (OEP), with different degrees of openness in the usage and creation of OER, ranging from "no usage" or "OER (re-) usage" to "OER (re-) usage and creation" of (see OPAL, 2009).

Figure 1: Matrix 1—Constitutive Elements of OEP (Source: Ehlers, 2011, p. 4)

In the OPAL framework (see Fig. 1), OEP is seen as use of resources in an open learning architecture with different degrees of openness in both aspects (Ehlers, 2011). And since OEP is essentially a collaborative practice involving shared knowledge creation among individuals, the diffusion of OEP within a context can be analyzed using a second matrix (see Fig. 2). It presents how OEP is socially embedded based on two dimensions: the individual freedom to practice open education and the involvement of others in OEP through shared practices (Ehlers, 2011).

Figure 2: Matrix 2 – Diffusion of Open Educational Practices (Source: Ehlers, 2011, p. 4)

While the first framework (Fig. 1) provides a structure to analyze the degree of implementation of OEP by individuals within a given context, the second framework (Fig. 2) is suitable for analyzing the extent to which OEP is embedded within the environment. Hence, both these become useful strategies when designing and developing, as well as implementing and evaluating OER initiatives.

This kind of engagement of teachers in OEP comprises significant change in their thinking and actions. And those who embrace this process are considered 'change agents' and/or 'innovators'. Adopters of innovations are categorized as follows: Innovators (2.5%); Early adopters (13.5%); Early majority (34%); Late majority (34%); and also Laggards (16%) (Rogers, 2003).

The adoption of OER as an innovation will be truly effective only if it reflects a change in the thinking, mindsets and actions of change agents. For building greater change in the capacity of educators, four core capacities have been identified—personal vision-building, inquiry, mastery, and collaboration (Fullan, 1993). Experience, reflection, and support are key common components supporting this process.

In a capacity development program on integrating OER in which the participants are expected to develop various competencies, careful orchestration of learning experiences with very clear and specific guidelines and support would be required. This is very effective when more context-centric learning approaches such as scenario-based learning are adopted (Naidu & Karunanayaka, 2014).

In this case learners are situated in an authentic learning scenario, which acts as the anchor for all teaching and learning activities. This real life story-like approach starts with a trigger to activate the learning process, and then take learners through a series of events including various learning and assessment tasks (see Naidu, 2010).

The learning 'engine' for effective, efficient and engaging learning

The following developmental process serves as the learning 'engine' for the development of such a learning experience (see Fig. 3), and in which the subject matter content serves as the 'essential fuel' that drives the learning engine (Naidu & Karunanayaka, 2014).

All five modules that comprised the OEReL online course adopted this design. The learning experience starts with a learning scenario, including learning activities consisting of both individual as well as group-based tasks leading to the assignments. The assessment included three sections—specific individual tasks; participation in the group discussion forum; and a self-reflection. These were assessed according to specific assessment rubrics prepared for each assignment.

Various forms of OER including text as well as multimedia were integrated within the content in different ways to support the learning and assessment tasks. Careful integration of OER in this manner serves as the 'essential fuel' for the 'learning engine' (Naidu, 2010). Each module was structured in the same manner maintaining consistency in the course design. Figure 4 is a screen capture of a sample module format.

The online learning environment created in Moodle (LMS) was designed considering the key design principles appropriate for e-Learning including real world, problem-based learning situations where learners are encouraged to become self-regulated learners (Naidu, 2006; Salmon, 2011). Group-based e-learning via text-based asynchronous conferencing in online discussion forums was extensively used, where peer-facilitated collaborative and cooperative learning was enhanced.

The integration of OER, which was the key feature in the OEReL course, was done in different ways and at different levels within the modules. The key focus in the approach taken was, starting from the first phase of access to and availability of OER, and then moving on to the second phase in OER development, shifting from the focus on resources to a focus on OEP, based on the OPAL Framework (Ehlers, 2011).
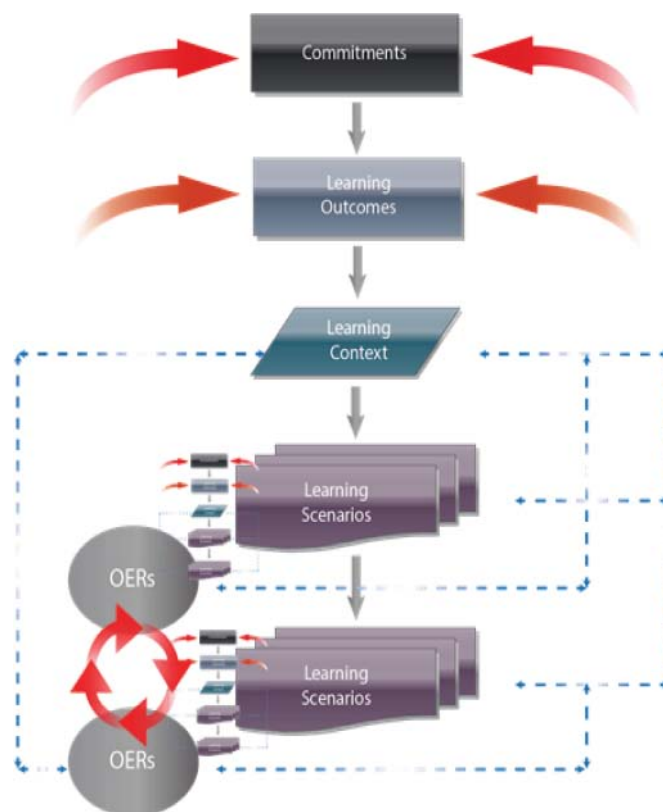
Figure 3: Engines of Education (Naidu & Karunanayaka, 2014, p. 8)

15 March - 21 March

Planning for an OER-based e-Learning Course

Learning Scenario - Planning for an OER-based e-learning course

Learning Activity - 1

Learning Resources - 1

Dialogue Begins...(Group Discussion - 1)

Assignment - Part I

Assignment Part I - Submission - Due 21 March 2015

Assessment Rubric - Part I

Figure 4: Screen capture of a sample module format

OER integration in the learning experiences was done horizontally within each module, as well as vertically across the modules. Horizontal integration was done by linking OER among the different elements within a single module. It included an OER-related learning scenario, leading to OER-related individual and group tasks, with the support of different forms of OER as learning resources. Further, vertical integration was done moving from simple activities that required only OER reuse in the first module, and gradually increasing the complexity of the activities requiring revise, remix and finally creation of OER in the fifth module.

Figure 5 illustrates how the 'engine' was implemented with different degrees openness in the usage and creation of OER, ranging from 'no usage' or 'OER (re-) usage' to 'OER (re-) usage and creation' (OPAL, 2009). For instance, in Module 1, when the concept of OER was novel to a majority of the participants ('no usage'), the learning experience was designed in a very simple manner requiring them only to refer to the existing OER ('OER re-usage') to develop their understandings.

During the progression with each module the complexity of these aspects were gradually increased. Finally, in Module 5, when the participants were quite comfortable with OER reuse and revise, they were required to engage in creation of an OER through revising/remixing, and redistribution by integrating it in an eLearning scenario ('4Rs').

Modules & Learning Outcomes	Different Ways of OER Integration - Examples			Different Levels of OER Integration	
	Learning Scenario	Learning and Assessment Tasks	Learning Resources		
	OER-related; Situated learning; Authentic; Goal-based, Problem-solving.	OER-related; Individual & group; Learning activities leading to the assessment tasks; Peer-facilitated discussion forums; Reflection in action.	Different forms of relevant OER as essential / additional resources	4R Framework (Wiley, 2006) From OER to OEP (OPAL framework, 2009)	
	← Linked across elements (horizontally) →				Increased degree of OEP (vertically)
1. Concept and Practices of OER - Demonstrate understanding of OER and related concepts. - Trace the historical development of OER. - Critically examine OER initiatives and develop a plan for your own institution	- Plan for a workshop for University lecturers on 'An Introduction to OER'	- Develop a concept map on OER related concepts - Develop a graphical representation on historical development of OER. - Develop a Workshop Plan on 'Concepts and Practices on OER' based on a SWOT Analysis on OER initiatives	-text-based readings - graphics -animations -video clips -quizzes -tutorials -software	Re-use; No / Low → Medium OER (re) usage; Closed methods → Open methods; Low → Medium → High Sharing; Collaboration; Reflection.	
2. Search and Evaluation of OER Materials					
3. Licensing and Copyrights	↓ Moving along similar lines through the modules (vertically) ↓				
4. Designing Learning Experiences for OER-based e-Learning	↓	↓	↓	↓	
5. Integrating OER in e-Learning - Demonstrate understanding of the affordance of e-learning - Integrate Open Educational Resources (OER) to optimize e-learning	- Make a presentation to the University administration on "affordances of e-learning and online learning" and demonstrate how integrating OER will optimize e-Learning.	- Prepare a presentation on the concepts of e-Learning and online learning and the affordances of e-Learning - Explain methods of integrating different types of OER selected to create a learning resource (OER), to be integrated in a learning scenario designed by you, for an e-Learning environment, and how it will optimize e-Learning	-text-based readings - graphics - animations - video clips - quizzes - tutorials - software	Re-use; Revise; Remix; Redistribute. Medium use → High OER (re)usage and Creation Open methods → More open methods; Medium → High Sharing; Collaboration; Reflection.	

Figure 5: Engine in Action—Matrix of different ways and levels of OER integration horizontally and vertically in the learning experiences

Further, in each module, the participants were also required to share their draft submissions with peers ('sharing'), review each other's' work through discussions ('collaboration'), and reflect on their learning experience ('reflection'). This enhanced moving from OER to OEP, and also from a lower to a higher degree of OEP.

Evaluation of impact

Research design and research questions

The focus of the research was to explore the impacts of an innovative professional development online course for educators on OER-based e-Learning. A case study approach was adopted, which allows an in-depth examination and gaining first-hand understanding of people and events in a real life context (Yin, 2003).

The following research questions guided this line of inquiry:

- What changes in capacity were observed in educators?
- What factors facilitated the professional development process?
- What factors hindered the professional development process?
- What are the impacts of the professional development process on educators?

Participants

The participants comprised 35 academic staff members. They constituted 18 females (51%) and 17 males (49%), indicating a gender equity in enrolment in the OEReL course. While a majority were with postgraduate qualifications, either PhD (n=13; 37%), Masters Degree (n=12; 35%), or Postgraduate Diploma (n=1; 3%), there were 9 participants (26%) with only a first degree as their highest qualification. Individual experience as an educator in the higher education sector ranged from 5 years or less (n=13; 37%) to more than 20 years (n=7; 20%), and 15 participants (43%) with 6–20 years of experience.

Methods of data collection and analysis

Data was collected using a variety of strategies at different stages during the 6-month course of study. These included administering general questionnaires, online learning experience questionnaires, a concept mapping exercise, analysis of discussion forum posts, analysis of self-reflections and conducting focus group interviews.

Table 1 presents a summary of the multiple data collection strategies adopted.

Table 1: Multiple strategies of data collection

Data collecting strategy	Stage	Number
1. General questionnaires	Pre/Mid/End course	03
2. Learning experience questionnaires	At the end of each module	05
3. Concept mapping exercise	Pre/Mid/End course	03
4. Discussion forum activities	Within each module	14
5. Self-reflections	After each assessment within each module	14
6. Focus group interviews	Pre/Mid/End course	03

Multiple sources of data allowed triangulation in order to establish causation.

Results and discussion

What changes in capacity were observed in educators?

Data gathered shows that capacity building occurred in different ways, in terms of development of new knowledge, thinking, perceptions, attitudes and skills, and specifically in the following aspects: understanding around key concepts related to OER and their relationships; skills in identifying, evaluating, adapting, developing and integrating OER in teaching and learning; competency in OER-based online course design; and confidence in applying the new knowledge and skills in their professional practice.

Participants' existing understandings about OER and related concepts revealed that a majority (above 60%) were quite familiar with open learning, open access and OER, while their familiarity was much lower with open licensing, open scholarship, open badges, MOOCs, Open Educational Practices, and OER-based e-Learning. Yet, all participants (100%) believed that OER has great potential for enhancing teaching-learning process, and were highly motivated to integrate it.

By mid-course, out of 35 registered, only 14 participants (40%) were actively engaged, and 10 participants (29%) successfully completed the full course having achieved online badges for all five modules. The 10 successful participants consisted of 07 females and 03 males including 01 Professor, 07 Senior Lecturers; and 02 Lecturers. This gradual decrease in the number of active participants perhaps is an indication of the notion that some are more open to adaptation (innovators, early adopters, early majority) than others (late majority; and laggards), who may need more time and support to adapt to an innovation (Rogers, 2003).

All successful participants agreed that their views had significantly changed from their original perceptions, gaining great familiarity with OER and related concepts. Figure 6 indicates how participants' understandings around key concepts related to OER have changed during the course as revealed by their perceptions at pre/mid/end course evaluation questionnaires. It demonstrates a gradual increase in their understandings and by the end of course, 100% understanding is claimed for all concepts except for two—Open Scholarship and MOOCs.
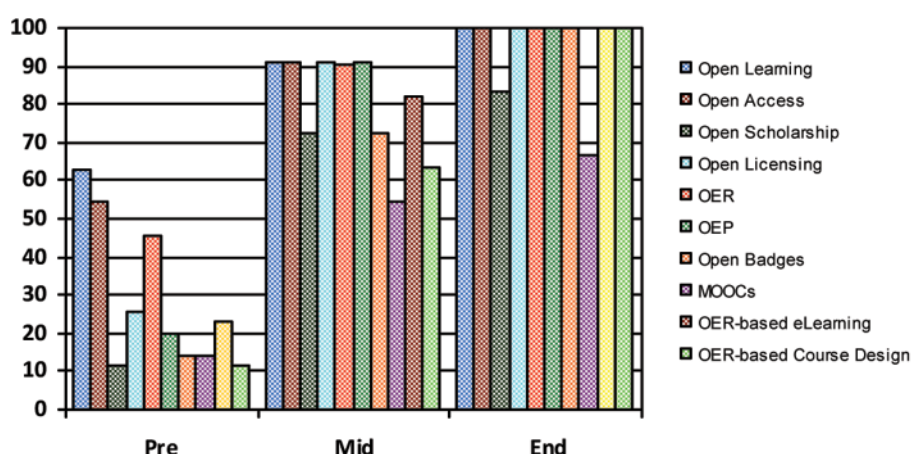

Figure 6: Participants' development of understandings on OER-related concepts

These changes were also graphically captured by the concept maps created by participants at different stages. A significant increase in the number of OER-related concepts and relationships among them was revealed, as illustrated by two versions of concept maps of a participant presented in Figure 7.
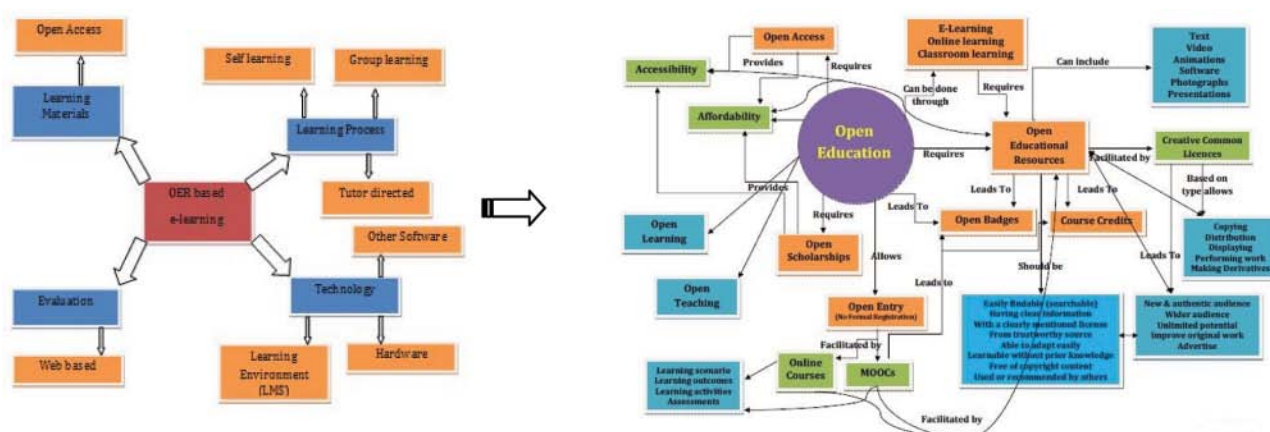
Figure 7: Pre-course and End-course concept maps of a participant

Similar results in the analysis of different versions of the concept maps of other participants' also confirmed the fact that the OEReL course enhanced developing understandings of OER-related concepts among educators.

What factors facilitated and hindered the professional development process?

Feedback received through the learning experience questionnaires on the participants' perceptions on different aspects on each module identified various facilitative as well as hindering factors that had affected their professional development process. These are summarized in Table 2.

Table 2: Participants' perceptions on each module

Statements	Average (Out of 5 Point Likert scale)				
	M1	M2	M3	M4	M5
1. The learning outcomes were made clear to me.	4.15	4.40	3.71	4.29	4.00
2. The learning resources incorporated study of current and up-to-date content.	3.77	4.30	3.57	4.57	4.17
3. The learning activities extended my knowledge of the topic.	4.46	4.30	4.14	4.43	3.67
4. The learning activities helped me to learn effectively.	4.15	4.30	3.86	4.43	3.83
5. The learning activities created opportunities for me to learn from my peers.	4.46	4.60	4.43	4.14	3.83
6. The learning activities enabled me to judge the quality of my own work.	4.15	4.20	3.71	4.00	4.00
7. The learning activities prepared me to complete my assessment tasks.	4.08	4.30	3.57	4.14	3.67
8. The learning experience engaged me with authentic issues and problems.	3.15	3.50	4.00	3.57	3.83
9. The goals of the assessment tasks were made clear to me.	4.31	4.00	3.86	4.43	3.83
10. The assessment tasks helped me to learn effectively.	4.31	4.30	4.00	4.14	3.67

Statements	Average (Out of 5 Point Likert scale)				
	M1	M2	M3	M4	M5
11. Feedback I received on assessment tasks was timely.	4.00	4.40	4.14	4.00	3.83
12. Feedback I received throughout helped me to learn effectively.	4.00	4.30	3.71	3.86	3.83
13. There was a clear connection between the learning outcomes, learning activities and the assessment tasks.	4.31	4.40	4.14	4.29	4.33
14. The use of MOODLE tools helped me to learn effectively	4.08	4.30	4.00	3.86	3.83
15. It was possible to complete all the learning and assessment activities within the specified timeframes.	3.15	3.80	3.00	3.14	2.50
16. The learning experience enabled me to achieve the learning outcomes of this module	4.08	4.50	3.71	4.57	4.00

A high average of satisfaction level (above 4) was evident in a majority of aspects in the learning experiences of all modules, while the specified timeframe received the lowest satisfaction. Self-reflections and focus group interviews further supported these. Table 3 provides a summary of the key facilitative and hindering factors.

Table 3: Facilitative and hindering factors in the professional development process

Category	Codes	Supportive quotes
Institution-related	Relevance	"The great motivation here was that it was very much related to my profession…"
	Time	"Managing everything at office and at home and finding time…was a big challenge…"
Course-related	Design	"The SBL design…learning resources…assessments…constructive feedback…helped me understand the concepts…"
	Workload	"Having assignments to submit each and every week is challenging and time consuming and sometimes frustrating too…"
Peer-related	Forum discussions	"Group discussion was interesting to interact…knowledge exchanged…peer learning was a great strength…"
	Non-participation	"The biggest failure in my learning exercise…is that I could not post any comments for my colleagues… I too did not get much feedback…"
Personal	Motivations	"From the beginning I was excited with this course as I am a firm believer that the knowledge should be shared…"
	Frustrations	"To answer this assignment you need to read and understand well which I could not, due to the heavy workload…I felt bad with my delay…"

Factors such as relevance of the content, SBL pedagogical design, learning and assessment tasks, peer-facilitated discussion forums, learning resources, study schedules, assessment rubrics, constructive feedback, flexibility with deadlines, self-motivation and award of badges have facilitated the process. A vast majority (80%–100%) were very satisfied with clear alignment between the learning outcomes, learning activities and assessments. All agreed that discussion forum was the

most helpful that facilitated them not only to understand content but also to self-assess and judge the quality of their work. These findings re-affirm the fact that the opportunity to experience, reflect, and support, has facilitated building the capacity of educators in the four areas—personal vision-building, inquiry, mastery, and collaboration (Fullan, 1993).

A common concern was about the allocated time. Above 80% had difficulty in completing all the learning and assessment activities within the specified timeframe of one week. About 50% stated that in certain modules, relevant learning resources were inadequate. While such hindering factors may have resulted in the non-completion of the course by 71% of the participants, it was evident that those who successfully completed the course (N=10; 29%) found solutions to overcome these issues with great commitment. They would be the 'innovators' and 'early adopters' (Rogers, 2003) who were able to adopt an innovation fast.

What are the impacts of the professional development process on educators?

Despite the challenges, all participants (100%) expressed that they highly enjoyed the learning experience. During their learning process, the participants were given ample opportunities for reflection – 'reflect on action' and 'reflect in action' (Schön, 1983). This was facilitated by including a self-reflection 'on' the learning experience as one assessment component in all the assignments and encouraging reflecting at discussion forums, while engaging 'in' the learning experience. It revealed how different aspects of the innovative practice have affected the participants.

Table 4 presents how different aspects of the innovative practice have impacted the participants.

Table 4: Impacts of the different aspects of OEReL course

Aspects	Supportive quotes	Impacts
Learning Scenario- Relevance; Authentic; Goal-based; Application;	*"…It motivated me to involve in this study as it is an authentic one and felt that I am a part of it… Overall, this was a thought provoking exercise… Nevertheless I learned a lot…I felt so happy about it and will be using this experiences in future activities…as now I am very much competent with a diverse knowledge on OER…".* *"…This whole exercise is a challenging one… Nevertheless all my efforts putting into this exercise is a fruitful one as I am practically involved in developing OER for OUSL. I will be using this knowledge in my future activities…Now I feel more confident in handling any OER related issue than earlier…"*	Changes in Perspectives; Changes in Practices; Satisfaction; Motivation; Self-confidence; Becoming a Learning Community; Becoming Reflective Practitioners.
Learning and Assessment Tasks – Relevance; Depth; Peer-support	*"…This part of the module sprang out another revelation to me. That is, even though the learn may look somewhat simple and small (in amount), the richness of information available within it could be much deeper and richer. The postings that were done by my colleagues in the discussion forum further emphasized this. It is really an exhilarating experience. Here I found different persons looking at things from different viewpoints and bringing out the richness in the lesson material…"*	
Learning Resources (OER)- Relevance; Variety; Adequacy; 4Rs;	*"…I did go through the resources in great detail…as I was interested in reading the material and took time more than I anticipated. But I am happy …as they are very relevant and interesting…"* *"… I finally located suitable material which permitted me to remix and revise…which I consider a great success. I managed to locate OER material in a variety of formats… it enhanced the e-learning experience…"*	

Analysis of reflections revealed common patterns of impacts on the participants in different aspects, and it was supporting them to become "reflective practitioners" during the process. The foregoing findings further implied that this learning experience has caused participants to move from a position of mere resource access toward open educational practices. All participants started the process at a state of "no usage" of OER, but then gradually moved towards different degrees of openness in the usage and creation of OER, either "OER (re-) usage" or "OER (re-) usage and creation" (Ehlers, 2011).

Conclusion

Participants' expectations in this course have been met beyond ours, and their expectations. They have been very happy with the development of their knowledge, skills and attitudes in relation to OER-based e-Learning. In addition to the enhancement of conceptual knowledge and skills related to searching, identifying, evaluating and integrating OER, participants also developed their competencies in designing, developing and implementation of an OER-based e-Learning course.

Despite various challenges the successful participants' commitment and motivation to find solutions and proceed with completing the course was commendable. The participants claimed that the experience gained through the engagement in this OER-based e-Learning course has been very effective in building their capacity as university educators, especially in an ODL system. It was evident that this innovative practice has significantly impacted adoption of OER by educators and their capacity to engage in OER-based e-Learning.

At a time where online teaching and learning is becoming widely popular within the higher education system in Sri Lanka, and with the growing need for raising awareness on the potentials of OER among educators, we believe this has been a timely venture. Both the facilitators and the participants, as co-learners, were able to engage in a very constructive series of activities related to their functions as OUSL academics. As an empowered and motivated group of academics in OER-based e-Learning at OUSL, they could actively and constructively contribute towards future challenging endeavors which should ultimately have a significant impact on OUSL taking the leadership in Sri Lanka, in this novel arena.

Acknowledgements

References

COL (2011). *UNESCO-COL Guidelines for Open Educational Resources (OER) in Higher Education*. Retrieved from http://oerworkshop.weebly.com/uploads/4/1/3/4/4134458/2011.04.22.oer_guidelines_for_higher_education.v2.pdf

Dhanarajan, G. & Abeywardena, I. S. (2013). Higher Education and Open Educational Resources in Asia. In G. Dhanarajan & D. Porter (Eds.). *Open Educational Resources: An Asian Perspective*. (pp. 3–18). Canada: COL & OERAsia.

Ehlers, U.-D. (2011). From open educational resources to open educational practices. e*Learning Papers* (23). Retrieved from https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/media25161.pdf

Fullan, M. G. (1993). The Professional Teacher: Why Teachers Must Become Change Agents *Educational Leadership*, *50*(6) March 1993. Retrieved from http://www.michaelfullan.ca/Articles_98-99/03_93.pdf

Hattaka, M. (2009). Build it and they will come? – Inhibiting factors for reuse of open content in developing countries. *EJISDC, 37*(5), 1–16.

Naidu, S. & Karunanayaka, S. (2014). Engines of Education: Integrating OER in Learning and Teaching. In S. Karunanayaka & S. Naidu (Eds.). *Integrating OER in educational practice: Practitioner stories* (pp. 3–22). Nawala: The Open University of Sri Lanka

Naidu, S. (2006). *E-Learning, A Guidebook of Principles, Procedures and Practices*. Commonwealth Educational Media Centre for Asia. Retrieved from http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Naidu, S. (2010). Using scenario-based learning to promote situated learning and develop professional knowledge. In E. P. Errington (ed.). *Preparing graduates for the professions using scenario-based learning* (pp. 39–49). Brisbane: Post Pressed.

OPAL (Open Educational Quality Initiative) Report. (2009). *OPAL Final report*. Retrieved from http://eu/eacea.ec.europa./llp/projects/public_parts/documents/ict/2009/mp_504893_ict_FR_opal.pdf

Rogers, E. (2003). *Diffusion of Innovations* (5th ed.). New York: The Free Press.

Salmon, G. (2011). *E-moderating: The key to teaching and learning online* (3rd ed.). New York: Routledge.

Schön, D. (1983). *The Reflective Practitioner: how professionals think in action.* New York: Basic Books.

Wiley, D. & Green, C. (2012). Why openness in education? In D. Oblinger (ed.). *Game changers: Education and information technologies* (pp. 81.89). Educause. Retrieved from http://www.educause.edu/library/resources/chapter-6-why-openness-education

Yin, R. K. (2003). *Case study methods*. Retrieved from http://www.cosmoscorp.com/Docs/AERAdraft.pdf