Case Studies on

OER-based
e-Learning

Editors

Som Naidu
Sanjaya Mishra

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Preface

A seismic shift is currently taking place in education, and it is about *open educational practices*. The key drivers of this shift are increasing availability, awareness and use of *open educational resources (OER)* presence of *ubiquitous computing (Ubicomp)*, realisation of the need for *education for all (EFA)*, and the interdependencies among them.

Open educational practice (OEP) is an umbrella term which incorporates a number of underlying concepts. Foremost among these are, *open learning* which are all learning opportunities that are unhindered by any *apriori* criteria such as location, age, gender or prior qualifications. A second critical aspect of OEP is *open access* and this has to do with unrestricted use of software and other educational resources. In order for this to happen, educational resources will need to carry a creative commons licence which would allow its reuse, revision, remix and redistribution. A third critical attribute of OEP is the practice of *open scholarship*. This has to do with the adoption of a sharing culture where the products of scholarship such as books, journal articles and learning resources are all made freely available for others to use, reuse, revise, remix and redistribute.

A classic case of OEP is MOOCs which are massive open online courses which are available for anyone with access to the Internet to take for credit or for personal interest and enrichment. Participation in OEP heralds a shift in the locus of responsibility for learning from the institution to individual learners. Innovative organisation models of learning and teaching to support such initiatives are already emerging. Notable examples of which are the OER university and School in a Cloud which utilise the power of the Internet and Web to make available learning opportunities to anyone from anywhere with access to the Internet.

Open educational resources (OER) are all educational resources that carry an open licence such as one of the Creative Commons licenses. Access to OER is directly related to the promotion of education for all (EFA), for without OER, the goal of education for all will risk being compromised. And access to ubiquitous computing is critical to the promotion of both, OER and EFA, for without affordable and efficient technologies, the development of OER and EFA is stymied (see Dourish & Bell, 2011).

Ubiquitous computing (Ubicomp) refers to the widespread availability of portable computers which are enabling the use of the *campus, community, work and industry environments* as valid locations for learning and teaching. Ubicomp is critical for

cloud-based and *mobile learning* and teaching including *virtual WIL* (work-integrated learning) in addition to physical WIL placements.

Together, these developments are crucial in prosecuting an agenda for *education for all*. Nobel Laureates Amartya Sen (1999) and Joseph Stiglitz (2012) have argued that education is a human right, and the path to real *freedom, justice* and *equality*. This has implications for our ability to engage with students and staff regardless of their location, designing programmes for multiple locations and multiple channels, and enabling students to better manage their time and mix location and channel to match their current and future life circumstances.

The widespread adoption of open educational practices has implications for the professional development of staff in the areas of curriculum renewal, adoption of and e*ngagement with OEP*, managing *workloads* and *time* in complex learning and teaching contexts, *optimising efficiencies and reusability*, and building collaborative partnerships with internal as well as external stakeholders.

The four case studies in this collection (*Open University of Sri Lanka; Indira Gandhi National Open University; National Institute of Open Schooling; Wawasan Open University*) show how these educational organisations are meeting these challenges and supporting *open education practices*. Work being carried out at the *Open University of Sri Lanka* is a testament to the development of engaged, self-directed and enriched learning opportunities as well as globally aware learners. Initiatives at the *Indira Gandhi National Open University* offer examples of innovative teaching, and creative use of learning technologies for developing academic capability and capacity, as well as scholarship in learning and teaching. The story of the *National Institute of Open Schooling* shows how this organisation is reaching many more students with the use of flexible modes of study, personalised learning, supporting learners and embracing social inclusion and diversity. Finally, work at *Wawasan Open University* epitomises the development of focussed courses, for promoting and pursuing academic quality and outstanding graduate outcomes.

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Open University of Sri Lanka – Integrating OER in a Teacher Education Course

Shironica Karunanayaka

Introduction

The Open University of Sri Lanka (OUSL) was established in 1980 with the main objective of enabling students to pursue further education through open and distance learning (ODL). The four Faculties of OUSL-Education, Engineering Technology, Humanities and Social Sciences and Natural Sciences, offer a variety of programmes of study, ranging from Certificates, Diplomas, Degrees, Postgraduate Diplomas, Masters and PhD (OUSL Homepage, 2013).

OUSL adopts a learner-centered study system which is specifically designed to facilitate the distance learners through multiple modes of delivery, including self-study print modules supplemented with audio-visual and interactive multimedia materials, as well as online learning. It provides a wide array of student support services, through a network of 31 centers situated throughout the country. OUSL has a current enrolment of over 35,000 students, and about 80% of the students are employed.

The Faculty of Education, the youngest Faculty was established in 2003, from the Department of Education which had been in existence since the inception of OUSL. The Faculty of Education offers professional development programmes for diverse groups of people engaged in the field of Education such as teachers, principals and teacher educators. A wide range of study programmes for these target groups are offered through its three Departments of Study, Secondary and Tertiary Education (STE), Early Childhood and Primary Education (ECPE) and Special Needs Education (SNE) (OUSL, Homepage, 2013).

This is a case study of how the Faculty of Education engaged in building capacity of its academic staff in the integration of OER in its teacher education programmes. The focus of this case study is the *Master of Arts in Teacher*

Education programme, and specifically one of its courses, "*Teacher Educator as an Educational Technologist*".

The Master of Arts in Teacher Education

The Master of Arts in Teacher Education (MATE) addresses an identified national need in the professional development of teacher educators in Sri Lanka. The MATE programme was developed by the then Department of Education with World Bank support, and has been on offer since 2001. In an attempt to improve the quality and transportability of the programme, the Faculty of Education in partnership with the Commonwealth of Learning (COL) developed the Master of Arts in Teacher Education – International (MATE-I) programme.

The need for a practitioner-oriented professional development programme for teacher educators already in the workforce was a key focus. The design and development of this unique programme took place during 2003-2004, with extensive collaboration and networking among local and international experts as well as institutions (Karunanayaka, Lekamge, Gunawardena, Naidu, & Menon, 2005; Karunanayaka, Lekamge, Gunawardena, Naidu & Menon, 2007). This new programme has been on offer to Sri Lankan teacher educators since 2005.

The MATE-I programme adopts a practitioner-oriented approach called 'Scenario-Based Learning' (SBL) in its course design, which is based on situated cognitive principles. SBL promotes a learning-centered approach which is more context-focused rather than content-focused. With the overall aim of 'producing a reflective teacher educator', the MATE-I programme focuses on developing critical competencies required by practicing teacher educators, by engaging them in playing various roles – namely a *teaching-learning specialist, curriculum developer, educational technologist, educational manager and leader, educational researcher*, and a *professional*, through six compulsory courses and a learning portfolio project (Karunanayaka et. al., 2005; Karunanayaka, 2007; Karunanayaka, Gunawardena, Naidu, Lekamge & Menon, 2008; Naidu, Menon, Gunawardena, Lekamge & Karunanayaka, 2005; Naidu, Menon, Gunawardena, Lekamge & Karunanayaka, 2007).

All six courses of the MATE-I programme are designed to meet the need for continuing professional development of teacher educators in the use of modern Information and Communication Technologies (ICT). They were all developed as online courses, under the ADB-funded Distance Education Modernisation Project (DEMP) at OUSL.

One of the courses in the programme, "Teacher Educator as an Educational Technologist" was the first stand-alone online course to be offered via the Learning Management System (LMS) Moodle, at the OUSL (Karunanayaka, 2008a).

Through these initiatives, more open and flexible study opportunities and increased access is offered to the target group of the programme, teacher educators who are adult learners, learning at a distance.

A major curriculum revision of the courses is currently under way. The content of the six courses are being revised and updated, while retaining the pedagogical approach. The course "Teacher Educator as an Educational Technologist" is being enhanced with the integration of Open Educational Resources (OER), under a project initiated at the Faculty of Education in partnership with COL, "Integration of ICT and OER into Teacher Education Programmes and Capacity Building of Teacher Educators at the Open University of Sri Lanka".

About the Course "Teacher Educator as an Educational Technologist"

The course "Teacher Educator as an Educational Technologist" (ESP2242) in the MATE-I programme aims to develop the competencies of teacher educators to design, develop, implement and evaluate appropriate educational technologies. The minimum duration of this course is 24 weeks. A series of learning activities that leads to the completion of four major assignments enable students to achieve the desired learning outcomes. There is no final examination in this course and student achievement in the course is assessed through continuous assessment based on the cumulative marks obtained for the four compulsory, inter-related assignments (MATE-I Programme Handbook, 2004; MATE-I Study Guide – ESP2242, 2004).

The learning resources of ESP2242 consists of self-study materials including a study guide, print-based essential readings, additional readings, as well as interactive multimedia materials and online resources, supplemented with face-to-face contact sessions and electronic communication with tutors. In 2005, an online learning environment created using the Learning Management System (LMS) called *Manhattan* was used to deliver the course. Later, a more interactive online learning environment was created using the web-based LMS Moodle, making it a blended online course. This online course is offered as the first stand-alone online course at OUSL since 2007 to practicing teacher educators and teachers who desire to develop their competencies in the use of educational technologies in their profession.

From January 2013, the course ESP2242 is being revised and improved with the integration of ICT and OER under a COL supported project. As part of this process the capacity of the academic staff is being developed to identify, evaluate, develop, adapt and integrate OERs into teacher education courses. Accordingly, the existing course is undergoing a significant review and re-designing process, with the main focus on providing more effective learning experiences to learners,

within the SBL approach, with the support of ICT and OER. It is expected to pilot the revised course in the latter part of 2013.

Instructional Strategy

The aim of the course ESP2242, 'Teacher Educator as an Educational Technologist' is to develop competencies among teacher educators in the design, development, implementation and evaluation of appropriate educational technologies. The course focuses on the critical role of a teacher educator, when functioning as an educational technologist in their professional setting. During the course of study, the learners are required to develop a rationale for using educational technology, design relevant learning experiences, select and use appropriate media to develop a technology-enhanced learning material and evaluate its effectiveness with their students (MATE-I Study Guide - ESP2242, 2004).

The above objectives are achieved through a Scenario-based learning (SBL) approach, where the learners are presented with authentic situations or scenarios in the form of a storyline, in which they are required to assume a key role that they will very likely perform in real life. Learners are required to engage in challenging tasks faced in the scenario, which become their learning and assessment activities, leading to achievement of the desired learning outcomes (see Karunanayaka & Naidu, 2009).

The interactive online learning environment of the course was grounded in the above pedagogy. Strengths of an online learning environment such as access to resources and ability to communicate and share with peers were utilised by adopting a structure of collaborative interactions through various strategies. This approach promoted building of a learning community among the distance learners through the use of technology (Karunanayaka, 2006; Karunanayaka, 2008a; Karunanayaka, 2008b; Karunanayaka, 2008c).

The learning experience in this course is based on the principle that learning is optimised when it is contextualised. As such, the learning activities and assessment tasks are designed to take place within realistic settings making them meaningful to the learners. Furthermore, these activities are designed to enhance development of required knowledge, attitudes and skills of teacher educators and application of these in their professional practice, requiring them to utilise higher-order cognitive skills such as problem solving and critical reflection. This represents a major shift from the traditional content-driven approaches towards a more context-driven approach to instructional design (Karunanayaka & Naidu, 2009).

Course Development Process

A course team approach, which is the usual practice of course development process at OUSL, was adopted in the development of the course 'Teacher Educator as an Educational Technologist'. Subject matter experts, instructional designers and web/multimedia developers worked in collaboration in course design and development, together with local and international experts' input through reviewing the course. Course development took place in different stages – Initial course-design using SBL approach, online course development, and OER Integration in the course.

The course team initially engaged in formulating the learning outcomes and developing scenarios to situate the teacher educators in authentic learning contexts, and designing learning and assessment activities for them. Relevant learning resources were identified and developed as required, in the form of print-based essential readings and additional readings, and also as interactive multimedia. A detailed study schedule which specified week-to-week activities that learners need to perform was developed.

'The Teacher Educator as an Educational Technologist' is an online course, given the need for not only concentrating on training teacher educators on integrating technology into their teaching, but also on their use of modern technology as a means for furthering their own professional development. At the outset, a supplemental online course using the LMS Manhattan was introduced where students could receive notices, submit assignments and communicate with staff and their peers through discussion forums. Later, the course was developed as a blended learning course using the Moodle LMS, creating a better learning environment for these distance learners. (Karunanayaka, 2006; Karunanayaka, 2008a; Karunanayaka, 2008b; Karunanayaka, 2008c; Karunanayaka & Naidu, 2009).

As online learning was a new experience for students, the course was designed with several forms of learner support. This included an orientation workshop to familiarise learners with the online learning environment and a 'Student Starter Kit' in print form with introductory guidelines. All learning resources such as the Study Guide, Essential and Additional Reading materials, which were originally in print form, are included as electronic resources in the LMS, including a variety of other resources such as audio clips, animations, PowerPoint presentations, PDF files, and Web links.

The Discussion Forum was extensively used to encourage cooperative and collaborative learning among the distance learners. A workshop session on multimedia production is conducted during the course in order to provide the learners with hands-on experience in multimedia development. All the

online and offline activities are linked with the assignments, and a percentage of the assignment mark was awarded for learners' active participation in the related online activities. They were also requested to maintain an online learning journal, to critically reflect on their learning experiences throughout the course (Karunanayaka, 2006; Karunanayaka, 2008a; Karunanayaka, 2008b; Karunanayaka, 2008c; Karunanayaka & Naidu, 2009).

During the current OER integration phase of the course development, the course team is engaged in improving the course through reviewing and revising the learning outcomes, developing new scenarios, learning activities and assessment tasks, with integration of ICT and OER, however, without changing its main aim and the pedagogical approach. Both offline and online learning activities and assessment tasks are being developed, integrating appropriate OER as supportive materials, in addition to the other existing resources. The key focus during this phase is not only on identifying, selecting and adopting relevant OER, but also on designing the learning experiences in order to effectively integrate OER to support learning. Further, orienting students towards OER, and encouraging them also to find and share OER is another consideration being addressed.

Challenges Faced

Throughout the course development process, the course team faced numerous challenges. During all key phases of the process – Course-design using SBL approach, online course development, and OER Integration in the course, the academic staff had to overcome several issues.

Designing the course using the SBL approach was the most challenging task initially undertaken by the course team. Developing scenarios with a storyline to situate the learners in a meaningful context was a creative process, which required a great deal of effort. Designing challenging offline and online activities to promote active participation of learners, was difficult. Constructive alignment of learning outcomes, learning activities and assessment tasks was essential, as was appropriately integrating them with the learning experiences.

ICT and OER integration in the course was very demanding for the course team. Designing and developing the online course with a suitable blend of various online and offline activities, providing variety, yet not overloading the students was a key challenge faced by the course team. Implementing the online course with the students was another challenge, since they were new to both, SBL approach and the online mode of learning. Constant monitoring and guidance by the instructors was required to support these distance learners who had to cope with new pedagogy as well as new technology. Staff workload was increased as a result.

The concept of OER is new to the course team and so identifying and finding relevant and appropriate OER to be integrated in the course was another significant challenge. Which OER was to be integrated, where to find them, how to integrate them, and to what extent, were some of the hard questions that the course team had to find answers for.

These challenges were addressed in various strategies. Foremost, capacity building workshops for academic staff were held during different phases of the process, on different aspects. A workshop on advanced instructional design was carried out initially to orient the staff on the use of the SBL approach. This was followed up with Moodle training workshops. In the OER-integration phase, staff participated in two capacity building workshops, during which their knowledge and skills were developed on how to identify and select relevant OER, as well as on how to design the course to effectively integrate OER.

In addition to the capacity building workshops, during each phase, a series of workshops were held in-between to monitor, review, evaluate and improve the courses, based on experiences being gained. For instance, currently, course teams are engaged in a series of course design and development workshops, to review and revise the course content and improve the online courses with appropriate integration of OER. The course team engages in these activities in a very cooperative and a collaborative manner, with the support and input from local and international experts at certain points.

Research activities in relation to the course design, development and implementation, were closely integrated and conducted throughout the process. Findings of these research studies help the course team to make decisions on course improvements. The current effort incorporates a major study into the capacity building of academic staff on OER integration – including what capacity has been built, to what extent, what are the challenges and what impact it has on them, using Interpretative Phenomenological Analysis (IPA) as a methodology for exploring in detail how participants are making sense of their personal and social world during this process.

Feedback from Instructors and Learners

Feedback received from instructors and learners during course evaluations at each phase indicate that these experiences have been very challenging, yet motivating to both groups. The following excerpts of course designers at the initial stage specify the challenges they had to overcome.

- …The initial challenge was articulating the story. Situating the story-making it authentic…I thought that was very interesting, but it was difficult also…It

took us a long time to really come out with what we wanted. I thought it was a very good experience for me…

- …This needs continuous engagement of the learners. We found out that some students had not understood exactly what was expected from the assignments…They were unable to relate theory into practice. That was the main difficulty they faced...

- …In this course, students need more help, as it is a practitioner-oriented course…When there are some students who are unable to cope with the work themselves, how are we going to tackle them…?

- Engagement in online learning has also been a highly challenging and a motivating experience for the learners, as revealed by their feedback given below.

- …At times the excitement of online learning too was dampened by technical factors beyond my control…

- …Actually in the first week I did not have a clear idea about how to follow the course as both "ET" and "Online learning" were new things for me…Now I feel very comfortable…

- …Learning is a challenge and it is fun. I enjoy it. I am becoming confident in using technology…I am sure going to use it and become an expert…

Even though the learners faced certain challenges such as coping with the technology and an increased workload, and changing from a conventional teacher-centered approach to a more self-regulated and reflective learning approach, a satisfactory feeling of a sense of achievement was claimed by them, once they became confident in online learning.

Feedback on OER integration process is being gathered from academic staff using various qualitative techniques such as concept mapping, individual narratives and focus group interviews. Staff members are developing three sets of concept maps depicting how their views on OER-related concepts and the relationships among the concepts have developed and changed during the process. The individual narratives and focus group interview data will supplement this information by further clarifying and qualifying their experiences during this capacity building exercise on OER integration.

Useful insights gained through the analysis of data and the experiences gained during the course design for ICT and OER integration in the course "Teacher Educator as an Educational Technologist" will enable identifying best practices in integrating OER and transferring this approach to the other courses in the MATE-I programme as well.

Reflections

"Teacher Educator as an Educational Technologist" is a course in a unique master's professional development programme for teacher educators, MATE-I, which adopts a learning-centered pedagogical approach. It is offered in the ODL mode to a group of mature learners in full-time employment. The use of the SBL approach allows achievement of the desired learning outcomes by learners, through building upon their existing competencies, with continuous guidance and facilitation by the teachers, within a learning environment that is enriched with ICT and OER integration.

The effectiveness of ICT and OER in enhancing learning will however depend on appropriate instructional design of the course content, learning experiences and learning resources. The learning environment of this course is enriched by resources, activities and tutor facilitation supporting the learners to engage in the learning experiences in a self-initiated manner, encouraging them to become self-regulated learners who will take responsibility for their learning. This encourages the expected change in the role of learners in a constructivist learning environment. In addition, the interactive online learning environment promotes collaborative learning among learners, by way of sharing ideas, experiences and resources that enhance building of a learning community.

Integration of OER in the course was driven by the need to further support and enriches its teaching-learning process. The SBL pedagogical approach adopted in the course design supported integration of OER in a more meaningful manner. It helped the course team to make decisions on how to select relevant OER and how to appropriately integrate those linking with the learning scenarios and activities, making the learning experiences more effective. In that sense, OER were not included just as some additional resources to the learners, but were built in the course design as integral components within the learning environment.

The design, development and implementation of the course, has been very challenging and demanding for the course team. However, in spite of various challenges, the course team succeeded in completing its tasks in each phase of course development process. The assistance and inputs from international and local experts received at different stages of course development, under various projects contributed to maintaining the high quality of the course.

It was evident from feedback that significant capacity building has occurred among academic staff in relation to adopting the SBL pedagogical approach in course design, online course development and OER integration. Their knowledge and skills in "learning-centered" course design and implementation, as well as on ICT and OER integration have been developed to a great extent. Further, confidence building in applying their new knowledge and skills transferring it to

their learners who are teacher educators and teachers was also apparent. Most importantly, attitude building on developing a "sharing culture" and promoting "Open Educational Practices" (OEP) among the academics is taking place.

Discussion Questions

1. What are the critical issues in integration of OER in teaching-learning situations?

2. What are the key challenges faced by course designers when integrating OER in the course? Compare and contrast with your own context.

3. Make suggestions on how to overcome such challenges and integrate OER in an effective manner?

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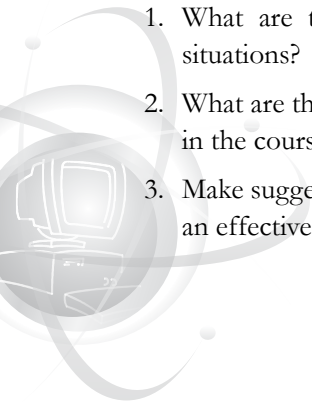
Indira Gandhi National Open University – OER-based Post Graduate Diploma in e-Learning

G. Mythili

Introduction

Online learning is a growing phenomenon in all sectors of education and training, and much of this is due to the growth of the Internet (American Society for Training and Development, 2003[1]). The Internet is a technological development that has the potential to change not only the way we access information and knowledge, but also alter our traditional models of higher education, particularly the models of delivery and interaction with resources (Singh et. al., 2005).

With widening access to the Internet, more and more institutions are using online learning in both face-to-face education and in distance education. For distance education, however, online learning comprises a logical extension of their mostly asynchronous teaching system supported by optional synchronous tutoring at designated times and places. Conventional approaches to distance education and face-to-face education can be further enhanced by the Internet and web technologies.

Even though the use of Internet and web technology in education is increasing, its effective use is lacking as institutions forge ahead to put up static web pages and downloadable zip files as evidence of online learning without considering the role of interaction and interactive learning materials. In India, while there is a wide variety or opportunities for training in the design of online learning, there are very few formal education programmes of high quality in e-Learning. The Post Graduate Diploma in e-Learning (PGDEL) offered online by IGNOU is one of those few. We present a case study of the PGDEL that is predominantly based on Open Educational Resources (OER) and largely based on resource-based learning.

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[1] http://www.astd.org/Publications/Books/Virtual-Training-Basics

About PGDEL Programme

The Indira Gandhi National Open University (IGNOU) is a pioneer in Open and Distance Learning (ODL). Currently, it is the largest Open University in the World. In fact, the establishment of IGNOU itself, is an innovation in the democratisation of access to higher education, and over the years, IGNOU has led the development of many more innovations, including the use of radio, TV, audio and video cassettes, CDs, audio conferencing, two-way video conferencing, EduSat, and the Internet.

The Post Graduate Diploma in e-Learning[2] is a unique programme which is offered through IGNOU's Staff Training and Research Institute of Distance Education (STRIDE). The programme has been designed and developed specifically for those who are engaged in or planning to be engaged in designing, developing, implementing and evaluating e-Learning programmes (Figure 2.1).

The PGDEL programme is specially designed for online learning and conceptualised as an OER based curriculum. It was visualised to provide better learning environment to the learners. The main objective of this programme is to develop human resources in planning, designing, developing, implementing and evaluating e-Learning programmes (PGDEL Concept Note, 2010).

The PGDEL incorporates both the theory and practice of e-Learning. The specific objectives of this online programme are to enable the learners to:

a. apply theoretical principles to design e-Learning programmes;

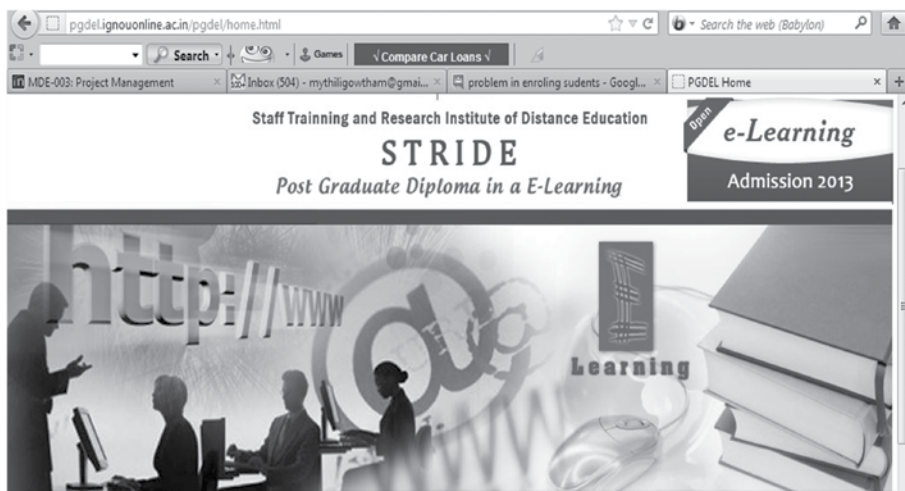b. identify innovative practices and developments in the field of e-Learning;

Figure 2.1: PGDEL Home Page

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[2] http://pgdel.ignouonline.ac.in/pgdel/home.html

Table 2.1: Course Details

Course code	Course title	Credits
MDE – 001	Introduction to e-Learning	4
MDE – 002	Design and facilitation of e-Learning courses	4
MDE – 003	Management of e-Learning projects	4
MDE – 004	Technologies for e-Learning	4
MDE – 005	Project work	8

c. use appropriate instructional design models for e-Learning programme;

d. teach online courses to develop collaborate learning and maintain communities of learners;

e. manage e-Learning projects;

f. select/create/modify appropriate OER for e-Learning; and

g. choose appropriate technology and develop content for e-Learning.

It is a 24 credit[3] online programme that can be completed in a minimum time of one year (680 hours of study). The PGDEL online is comprised of five courses as given in Table 2.1.

The course "Technologies for e-Learning" is a practical course, and the only course that requires attendance in a face-to-face hands-on one week workshop at IGNOU in Delhi. The project work deals with design and development of short online course of any subject by the learner and is largely application oriented and given an opportunity to the learners to demonstrate synergy and integration on learning from the other four courses. The learners are given the option to either choose the institutional LMS to run their course or they may have other options to run their course. They need to actually run a course with some 15-20 students, and write a report.

Need Assessment

The e-Learning market is growing nationally and internationally. It is projected that the e-Learning industry in Asia is poised for a Compound Annual Growth Rate (CAGR) of 25-30% and that was in 2010. The NASSCOM also predicts a growth rate of 25% for Indian e-Learning industry (Mathur, 2006). More than the industry, it is the educational institutions in the country that needs urgent upgrade of skills related to the use of the Internet and the web for educational purposes. Various initiatives are being put in place, including the development of e-Learning

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[3] One credit is equivalent to 30 student study hours

modules and knowledge portals. This also includes a National Programme on Technology Enhanced Learning (NPTEL[4]), and a national portal on education (SAKSHAT[5]). But despite these developments, much of the learning in relation to e-Learning takes place informally and on the job. The PGDEL is a response to this deficit in the availability of appropriate formal education programme on e-Learning.

Instructional Design for PGDEL

The PGDEL programme followed ADDIE model for instructional design (Figure 2.2).

Target Group

• Teachers, trainers, training manages instructional designers and course developers in colleges, universities and industry.

Type of Programme

• PG certificate/PG Diploma
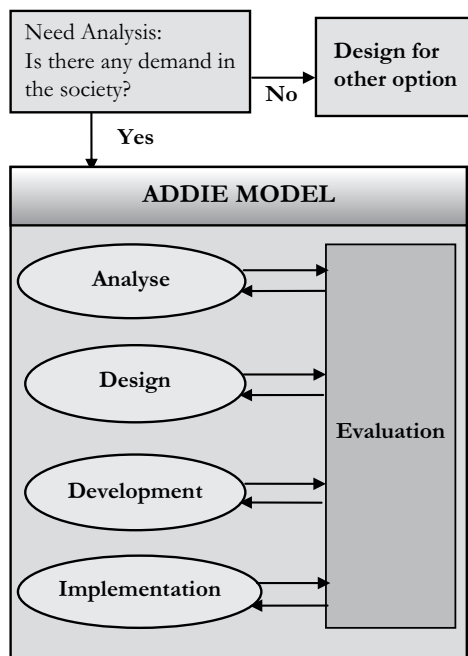
Level of the programme

• Post Graduate

Figure 2.2: Instructional Design Model

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[4] http://nptel.ac.in/
[5] http://www.sakshat.ac.in/

Design

The PGDEL is designed as 24 credit online programme with 5 courses. Since it is professional development programme on e-Learning, each course covers academic and pedagogical as well as professional aspects. A committee of e-Learning experts and practitioners in the country validated a curriculum developed by the university in a workshop.

Development

The PGDEL programme comprised two development phases, namely (i) Content development (ii) Technology development.

a. **Content Development:** One of the major objectives of this programme was to use OER in the courses. Identification of suitable OER materials for the courses was most challenging tasks. Based on the proposed curriculum, relevant OER for the three theoretical subjects were identified for review of the experts in the curriculum design workshop. These were validated by the experts to be used as course materials and linked from the Learning Management System (LMS).

b. **Technology Development:** Selection of technology environment is very important for online programme. Accessibility and usability issues from the perspective of both teachers and students were considered while selecting relevant technology. The PGDEL programme focuses on open source software in its content and student communications. After consulting with the experts and Moodle, an open source LMS was selected for teaching and learning processes of PGDEL programme. However, as the programme design included synchronous video conference session, we used Adobe Connect for the purpose, as the University had 50 user licenses for the same. However, in retrospect, we believe use of BigBlueButton[6] could also have served the purpose.

Implementation

The PGDEL was deployed using Moodle hosted in eGyankosh[7] of IGNOU. Figure 2.3 shows the implementation/delivery environment.

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[6] http://bigbluebutton.org/
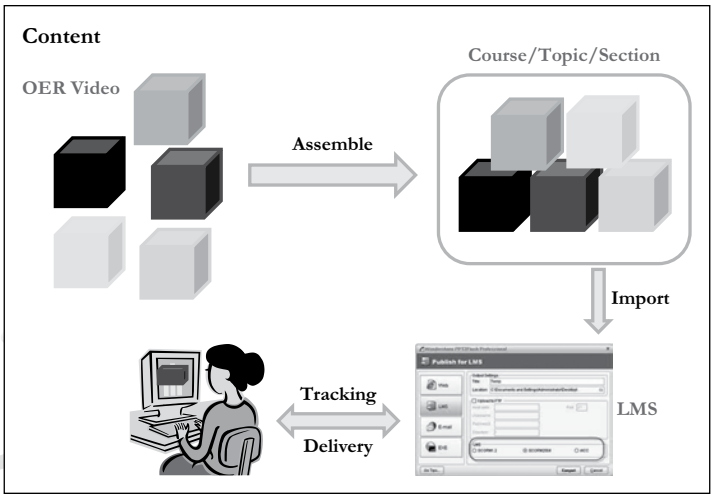[7] http://web.archive.org/web/20130904161249/http://www.egyankosh.ac.in/

Figure 2.3: Programme Delivery

Evaluation

We conducted regular review and evaluation of the platform, and checked the content and links to remain update. For the student assessment, we followed practical, term papers and project work, instead of the regular pen and paper test. We also conducted online surveys during the course to help the learners know about their attitude towards learning, and satisfaction about their progress. The synchronous video conference sessions helped also to remain in touch with the learners and receive feedback.

Instructional Strategy

The PGDEL programme utilises a wide range of instructional strategies (Figure 2.4) including, independent study, forum discussion, group work, lecture on Adobe Connect, collaborative learning, role play, practical and project work.
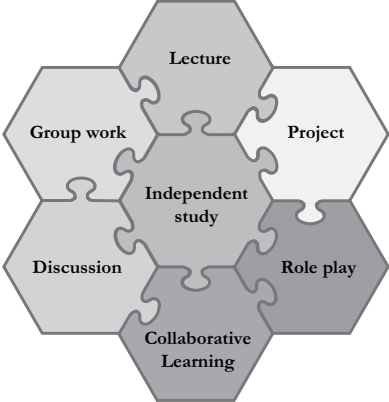

Figure 2.4: Multiple Instructional Strategies in PGDEL

Independent Study: Independent study allows the adult learner to engage in self-paced, self-directed, and individualised learning. In the PGDEL programme, relevant OER materials are uploaded in the LMS which the learners are required to study independently. A weekly schedule is provided to motivate and pace their study independently.

Lecture: A lecture is a commonly used instructional strategy in traditional teaching practice. Lectures are very effective when used with other instructional strategies. Online lectures can be effective if the teacher and the learners have uninterrupted internet connectivity. Recorded audio and video lectures also can be used in online programmes. PGDEL effectively uses Adobe Connect which is commercial software for online lecturing and interactivity. Each course incorporates at least a half a dozen online classes. The schedule of online classes is sent in advance so that learners can attend and utilise the lectures effectively.

Discussion: Discussion is an important instructional strategy. It allows learners to think critically and explore all possible ways to improve their skills. Online platforms provide discussion forums to encourage online discussion. In PGDEL a minimum of two discussion forums have been included which are evaluated and the scores reflected in the final assessment of learners. Moodle provides easy to use tools for hosting discussions. Teachers monitor the interaction that takes place in the discussion forum and motivate the learners to enhance their learning experiences.

Group Work: Group work provides an opportunity to discuss content, share ideas, solve problems and think critically in groups. This leads to healthy interaction among peers. Each course of the PGDEL has group work. The groups interact through Google group mail, mobile phones and discussion forums, and submit a report.

Collaborative Learning: Collaborative learning encourages learners to work in groups. Groups or teams select relevant topics among themselves for discussing, and exchanging views. Learners use google drive for collaboratively working on documents. We also encouraged them to use the internal wiki of the LMS to work in groups and learn collaboratively.

Role Play: Role play is another instructional strategy which is especially helpful for engaging with real world issues. The PGDEL programme provides opportunities to learners to play different roles as part of their learning experience. These include playing out the role of a content developer, course coordinator, and online teacher/instructor on Moodle of their own online course.

Project: A project provides learners with the practical experience and an opportunity to pursue work on something of their interest. The PGDEL programme has allocated 8 credits for project work. As part of this work,

learners engage in the design and development of an online course. Each learner implements the online course in Moodle and delivers the course real time (PGDEL Programme Guide, 2013).

OER Content

The PGDEL programme has been developed in fully online environment using Moodle. Eligible students receive user ID and password to interact and learn through Moodle LMS. OER based course materials are uploaded in the LMS which the learners can download and study in offline mode (Figure 2.5).
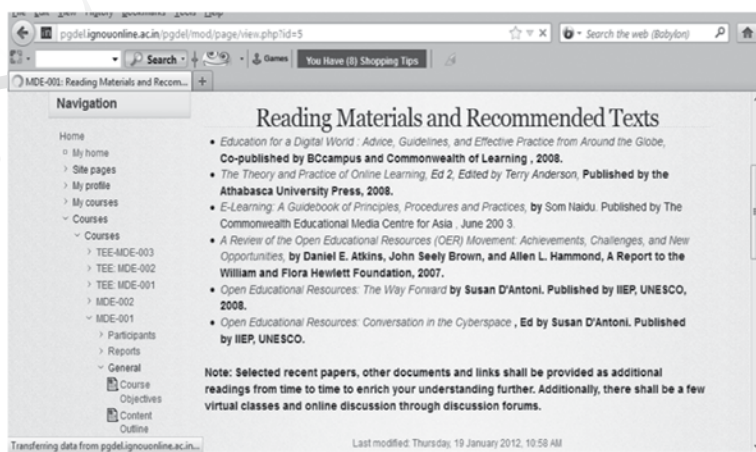

Figure 2.5: Example of Course Materials of PGDEL

Apart from this content, learners are provided links and PowerPoint presentations whenever required. Learners also learn how to use additional open source software for concept mapping, scheduling, and working on e-Learning projects in this programme.

Interactivity

Interactivity is a promising source of timely and cost effective learner support in online learning. The PGDEL programme offers opportunities for asynchronous interactivity through discussion forums and other additional tools. The programme used both online synchronous and asynchronous technologies to provide interactivity besides the face-to-face interaction in the five-day practical workshop. Real time interaction between teachers and learners through the use of Adobe Connect (Figure 2.6) was provided for lectures in the three theory courses. A virtual link is sent to the learners in advance (with data and time) so that they can make arrangements to participate in these sessions. Real time instant messaging within the LMS was used to facilitate communication between individuals and peer groups. Each course in the programme has two discussion
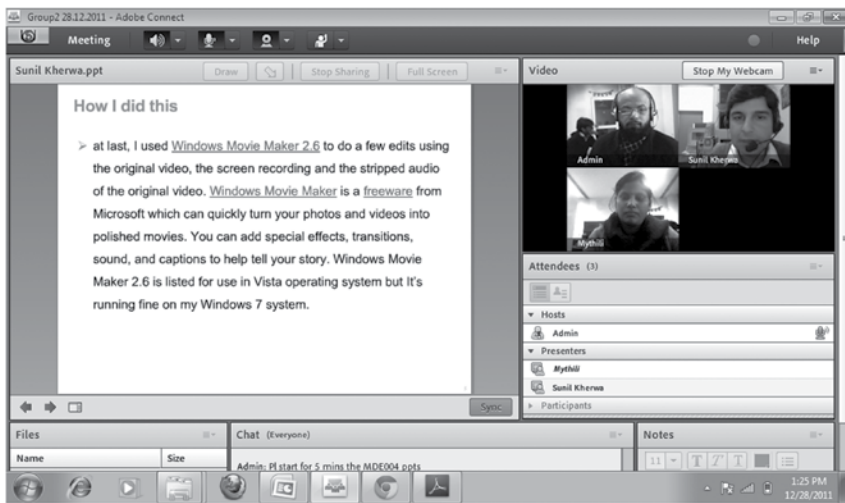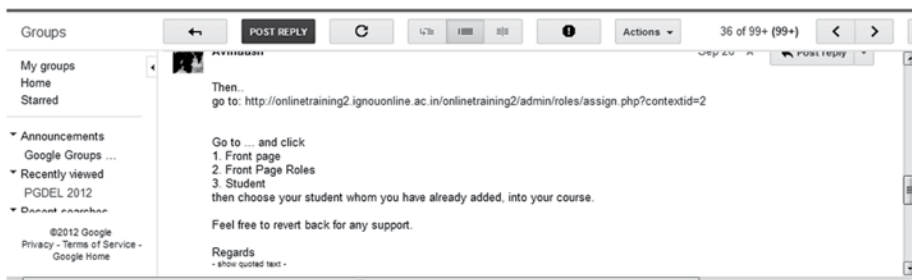
Figure 2.6: Example of Adobe Connect Use

Figure 2.7: Google Group of the Programme

forums within the LMS. Participation in these discussion forums are factored into students overall grade in the course. Students are also included in a Google Group (Figure 2.7) for general interaction among the learners.

Challenges Faced

Most of the OER selected for PGDEL programme are in pdf format. These OER are placed in the Moodle LMS. Learners are required to download and read these materials as part of their study. While these are appropriate and useful, some student expected more interactive learning materials in the programme, and believed that use of PDF is not useful in an online learning. For the learners, finding appropriate OER and integrating in their course was a challenge. Without a set of quality guidelines course teams and learners also had difficulty in identifying the most appropriate learning materials. While we use the expert validation for the identified materials, OER to be used more frequently in another context need associated metadata about quality assurance. Students felt that the project work is quite challenging, and needed extra time to complete.

Reflection on OER Integration and Practice

The PGDEL is an innovative programme that reduced the programme development time and cost by using available and appropriate OER. We strongly believed that for a programme on e-Learning development of fresh course content is not necessary, and even if, we started developing the contents, it would be obsolete by the time the contents are developed in-house. Thus, use of OER is the right choice, as we offered the programme online, used synchronous technologies, and had only 50 licenses of the proprietary video conference product, we were limited to admit only 50 students in the course. In a programme with limited enrollments, its developmental cost would have been much and the programme could not reach economies of scale without use of OER.

The PGDEL programme is a professional development programme in e-Learning. Participants in the programme are seeking to become online educators, and managers/administrators of e-Learning. As a result of feedback from participants in the programme, the following modifications were made.

- From 2011 onwards all students were required to use Moodle for their project work, as allowing them to use their own LMS for their project work was becoming difficult to monitor and support.

- Improvements were made to the face-to-face hands-on practice sessions.

Student Satisfaction Survey for PGDEL Programme

A student satisfaction survey (Strachota, 2003) was used to collect feedback from the PGDEL learners. The instrument used is based on a typology of online interaction by Moore & Kearsley (2005, 1996). This typology of online interaction includes: learner content interaction, learner-teacher interaction, learner-learner interaction and learner technology interaction. The instrument was sent to 45 learners who had successfully completed the PGDEL programme during last 3 years (2010, 2011, and 2012). All together 22 students responded to the survey.

Learner-Content Interaction: Learner-content was about participants' interaction with OER, learning activities, assignments, discussion forum, quizzes and course websites. The majority of the respondents agreed that OER materials used in the course facilitated their learning. 64% of the respondents suggested that the preparation of assignments, quizzes and exams helped improve their written and communication skills, while 73% of respondents agreed that learning activities in the courses required critical thinking which facilitated their learning (see Table 2.2).

Table 2.2: Learner-Content Interaction

Items	Agreed (%)	Strongly Agreed (%)
The material-OER used in the course facilitated my learning.	64	36
The websites that were linked to the courses facilitated my learning.	64	36
The assignments and/or projects in the courses facilitated my learning.	45	45
Preparation for quizzes/assignment/exams has helped improve my written/communication skills.	64	27
The learning activities in this courses required application of problem solving skills which facilitated my learning.	55	36
The learning activities in this course required critical thinking which facilitated my learning.	73	23

Learner-Teacher Interaction: The majority of the respondents agreed that teachers of PGDEL programme served as active participants in the discussion groups offering direction to posted comments. 55% of learners said that they received timely feedback, while a similar percentage of learners felt that they received individualised attention from the course teachers. The majority also agreed that course teachers continually encouraged communication among students and teachers (see Table 2.3).

Table 2.3: Learner-Teacher Interaction

Items	Agreed (%)	Strongly Agreed (%)
In this programme the teacher was an active member of the discussion group offering direction to posted comments.	55	41
I received timely feedback (within 24-28 hours) from my teacher.	36	55
I felt frustrated due to lack of feedback from my teacher.	0	5
I was able to get individualised attention from my teacher when needed.	55	23
In this programme the teacher functioned as a facilitator of the course by continuously encouraging communication.	59	32

Table 2.4: Learner-Learner Interaction

Items	Agreed (%)	Strongly Agreed (%)
In this programme the online discussion forum provided opportunities for problem solving with other students.	55	41
In this programme the collaboration and practice provided opportunities for critical thinking with other students.	68	14
This programme created a sense of community among students.	68	32
In this class I was able to ask for clarification from fellow students when needed.	81	19
I received timely feedback from students in the programme.	73	18
This online programme encouraged students to discuss ideas and concepts covered with other students.	59	32

Learner-Learner Interaction: The PGDEL supports interaction among learners through various means including Google groups and online discussion forums. The majority of the respondents agreed that online discussion forum provided opportunities for problem solving with other students. A majority believed that collaboration and practice provided opportunities for critical thinking with other students. 68% of learners agreed that the PGDEL programme helped create a sense of community among students (see Table 2.4).

Learner-Technology Interaction: A majority of the respondents found Moodle easy to manage and enjoyable to work with. Some of their reactions are given in Table 2.5.

Table 2.5: Learner-Technology Interaction

Items	Agreed (%)	Strongly Agreed (%)
Most difficulties I encounter when using computer, I can deal with.	48	13
I find working with LMS very easy.	55	27
Enjoy working with LMS.	59	27
Computer makes me much more productive.	68	32
I am very confident in my ability to use LMS.	41	27

Contd...

Items	Agreed (%)	Strongly Agreed (%)
Using computer makes learning more effective.	57	33
Some computer software definitely makes learning easier.	59	41
I can manage LMS as administration.	36	23
I can manage LMS as teacher.	50	32
I consider myself a skilled computer user.	64	27

Overall Satisfaction: Overall, a majority of the respondents (65%) expressed satisfaction with the PGDEL programme, and willing to take up another online programme in the future. Many agreed to recommend this programme to others. 50% of the respondents believed that they had learnt much from this online programme.

Conclusion

e-Learning offers tremendous opportunities for both learners and educational organisations. For learners, it offers an opportunity to engage in a highly interactive and rich learning experience at any time and from anywhere and any place with reliable connectivity to the Internet. For organisations, it offers an opportunity to offer programmes to larger numbers of students without a commensurate increase in delivery costs. Though the experience had been quite satisfactory, the course coordinators felt that their workload had increased significantly due to the online programme. They received the University innovation Award for the Year 2013 for the programme, which is recognition of successfully running a programme with extra efforts. The programme used OER effectively, and created an environment of learner engagement with the OER content, tutors and also learners. It also emphasised that teaching and learning is all about interaction and engagement to build skills, promote critical thinking and reflection, and provide evidence of learning through demonstration of knowledge skills and attitudes. OER is only one aspect of the process, and can be effectively integrated in online learning programmes. This is certainly going to save time and resources, as in this case study.

National Institute of Open Schooling – Open Educational Resource Initiative

S.K. Prasad

Introduction

The National Institute of Open Schooling (NIOS), India was established in November, 1989 as an autonomous organisation of the Ministry of Human Resource Development (MHRD), Government of India. With cumulative enrolment of 2.02 Million, NIOS has grown today as the largest open school in the world. It offers Secondary and Senior Secondary level education plus a number of Vocational Education Courses and Elementary Education through the Open and Distance Learning (ODL) mode. The Elementary Education programme is offered through its Open Basic Education Programme at Level-A, Level-B and Level-C which is equivalent respectively to Class 3, Class 5 and Class 8 of the formal education system.

It is not only a national board with the authority to examine and certify learners but also a national resource organisation for open schooling. The institute develops curriculum and prepares self-learning material, including audio, video and multi-media resources for its learners. It accredits conventional schools and agencies to provide support services to its enrolled learners. It conducts two public examinations in a year as well as On Demand Examination (ODE) throughout the year for the benefit of the learners. It also functions as a publishing house and brings out several publications every year. The Institute conducts research in open schooling and also organises training and capacity building activities for ODL functionaries. NIOS offers a toll-free call centre facility to its learners 24x7 to assist them in solving their pedagogic and administrative issues.

The NIOS OER Initiative

NIOS adopted Open Educational Resources (OER) specifically for vocational programmes to be offered at Secondary (10th) and Senior Secondary (10+2) levels,

including stand-alone programmes, in partnership with state level institutions and organisations. The objectives of the OER initiative were as follows:

- Create OER in the form of role-based modules;

- Develop and deliver vocational education programmes supported by OER to help learners obtain their livelihood in society;

- Create and manage Course Teams and Study/Training Centre Teams and their services for learners along with continuous improvement of their vocational competencies and capabilities;

- Create, manage and maintain learner groups and communities of teachers/ trainers and learners and practitioners for continuous and sustainable development; and

- Create a network of provider institutions, teachers and trainers, users and agencies involved in vocational education and employment and form their consortium or alliance for sustainable programme development and deployment.

Programme/Course Specific Information

At this early stage in the development of this programme of activity, NIOS has developed OER in the following areas of vocational education:

- ICT Applications;

- Rural Technology; and

- Tourism and Hospitality

These can be accessed online (see Figure 3.1) through the main page of NIOS, while the site has a sub-domain[1] within the NIOS website.

Figure 3.1: NIOS OER Site

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[1] http://oer.nios.ac.in/wiki/index.php/Main_Page

Instructional Strategy

The instructional strategy of the OER initiative at NIOS includes:

a. Use of self-instructional material with scope for formative assessment and joyful learning, and incorporates multimedia components like pictures, flash animations, PowerPoint presentations, videos and interactive tests.

b. Concepts identified and developed by experts through content analysis and job-role based functions.

c. Constructivist approach to learning, where emphasis is given to collaborative learning and reflective learning suitable for job-roles.

d. Scenario-based learning is encouraged and in most of the cases at least one skill based objective has to be kept as one of the objectives.

OER Development Process

The OER development process takes several steps to maintain quality, and can be outlined as follows:

- *Constitution of Course Teams:* A course team approach was adopted for the development of OERs, with the team having at least one subject matter expert as the course coordinator.

- *General Orientation of Course team:* Several workshops were held to orient the OER course teams to enable them understand the concept of OER including copyright issues. A separate Server was installed with using MediaWiki software to help collaborative course development.

- *Development of OER in Workshop Mode:* The courses were developed in three workshops after the initial orientation of the course team, where through content analysis and discussions, the syllabus for the course was agreed.

- *Details of OERs Developed:* OERs have been developed in the form of self-learning materials. Table 3.1 gives details of the type of content in OER repository.

Table 3.1: Content Types in NIOS OER Repository

Course	No. of OER developed	Multi-media Component				
		Flash	PP	Photo	Video	Activities
ICT Applications	67	34	0	29	5	1
Rural Technology	241	3	1	116	4	1
Tourism and Hospitality	131*	1	1	107	12	19

* 47 already developed and rest under development.

- *Structure of Concept based OERs as SLMs:* The OER consists of the concept map, objectives, introduction, activities and assignments with interactive activities, formative assessments and inputs for scenario based learning. In the majority of the cases, skill based objectives have been retained and opportunities for learning skills through videos, assessment tools and activities (developed by participants and identified by the participants from OER pool) included. All multimedia components were developed simultaneously. Various PowerPoint presentations, flash animations, videos, pictures, clip arts, interactive quizzes etc. were also developed.

- *OER being used in NIOS Teaching Learning:* The OER developed for the three courses are being used by the NIOS students enrolled for these courses. Besides, these are now in the process of being integrated to the Virtual Open Schooling platform for independent delivery. As evidence from web analytics, many others, who are not students of NIOS are also using these materials. About 40% of traffic to the site comes from non-Indian IP address.

OER Policy of NIOS

NIOS OER Policy, which is subject to approval of the NIOS authority, states the following:

1. *Open Educational Resources (OER)* are materials used to support education that may be freely accessed, reused, modified and shared by anyone.

2. NIOS OER will also be accessible to all learners free of cost, interested in development of their knowledge and skills.

3. NIOS OER aims to enhance the accessibility to quality education for all.

4. NIOS will use the free and open Creative Commons licenses as the core licensing principle for OER outputs.

5. The materials will be made available to reuse, revise, remix and redistribute the materials within the framework of CC-BY-SA-NC license.

6. NIOS OER will ensure continuous upgrade of content.

7. NIOS encourages open and transparent design and development of courses using open and accessible technologies.

8. NIOS fosters sharing among the participants in learning process.

Challenges Faced

The OER development in the selected vocational areas was planned in a way that during the developmental stages the teachers would be empowered in using the new technology as well as in pedagogical design aspects. The underlying assumption is that OER is an emerging concept and practicing teachers who are

experts in their subject areas are not technologically proficient and pedagogically oriented to develop self-learning materials. Some of the expert teachers trained did not participate in the course of development, and therefore cased delay in preparation of OER. During the training/orientation session, multiple views on OER and copyright were addressed. Teachers were also concerned about the quality and its evaluation, especially within the MediaWiki environment, as they are familiar with the Wikipedia that allows others to edit content. To resolve this concern, NIOS has made the MediaWiki server open only to select course developers. It was observed that the practising teachers required a lot many hours of pedagogical orientation, handholding and support in the development of self-learning materials using constructivist pedagogy, as they are used to conventional methods of teaching based on textual material.

Reflections on Practices

- The OER developed focussed on the skills and roles related to the courses taken. The first hand experience of the team in the field helped in achieving this aim.

- The course team members involved were practising teachers and instructors in the Accredited Vocational Institutions, which helped to complete the development of OER.

- Already a pool of teachers has become users of the NIOS/OER platform and a network has also been created for regular interaction. Learners from the vocational study centres are also using the OER for their learning.

- Networking has already been created and institutionalised with the creation of the NIOS Wiki platform where all experts from various institutions, trainers from vocational study centres and learners contribute in the development.

Feedback

The following are some comments from evaluators of the OER:

OER's developed for Hospitality and Tourism, and Rural Technology courses for distance learning are useful as developers made efforts to make material interesting using multimedia. Developers tried to incorporate activities that can be completed by learners using available material. By watching demonstrations provided learners can practice different skills that comprise major part of these vocational courses (SR).

I learned many new things about Tourism and Hospitality management and Rural Technology and NIOS OER. Sometime our mindset is difficult to change or accept new things, but once we understand the impact/benefits/change, then the task/work is joyful and meaningful. NIOS can develop more OER or learning material and learn in collaboration. I am happy to see the OER work of NIOS (NDD).

Conclusion

The National Institute of Open Schooling (NIOS) has initiated Open Educational Resources (OER), specifically to support vocational programmes offered at the tertiary education level. The NIOS has been making concerted efforts for development of Open and Distance Learning (ODL) system, particularly at the school level, by establishing a network of open schools to further strengthen the open schooling movement in India. At this juncture the present OER will not only be beneficial for the school students pursuing their studies through ODL, but also will be accessible to millions of learners interested in development of their skills in various vocations. This will also help in strengthening curricula at Secondary and Senior Secondary levels in incorporating skill development courses.

OER has the advantage of making learning enjoyable, opens up possibility of accessibility to quality education by all, and enables continuous upgradation of contents by subject experts. The NIOS OERs have been presented in the form of role based small modules suitable for students, and those could be adopted or adapted by the learners in their own context. This has been made possible due to dedication and unstinting support from internal faculty of NIOS, subject experts and learning community.

The content of OER is reusable after contextualising it for NIOS's Virtual Open Schooling (VOS), an online platform for enhancing access to quality education. As of now NIOS has launched two programmes through VOS, namely ICT Applications and Rural Technology.

The OER initiative at NIOS is a small beginning to encourage creation of OER in many other areas of school education. It will further support NIOS's efforts to widen access to education and facilitate lifelong learning.

4 Wawasan Open University – Developing a Fully OER-based Course

Mohan B. Menon

Introduction

Wawasan Open University is a relatively young and small university established in 2007, by a charitable foundation, to provide low cost, flexible access to higher education for Malaysian adults. Over the last five years it has embarked on a series of innovative and cost effective approaches to providing educational services to the Malaysian public. It uses flexible modalities to make higher education accessible to all – anytime, anywhere – and to create a lifelong learning community for aspiring individuals regardless of their previous educational, ethnic or socio-economic background.

Through a model of open distance learning, self-paced learning and flexible study pathways, WOU enables adults in the workforce to pursue their educational dreams without much disruption to their professional and personal commitments. WOU is an institution that aims to equip the contemporary workforce with industry-relevant knowledge and skills through its quality, market-driven programmes, while they continue in their jobs (WOU, 2013).

Currently, WOU offers over 40 programmes ranging from the sub-degree to postgraduate levels in the fields of business, technology, education and liberal studies, three MBA and Ph.D programmes. WOU produced its first batch of MBA graduates in 2010, and its pioneer batch of Bachelor's degree students in 2011. All its programmes are fully approved by the Malaysian Ministry of Higher Education (MOHE) and the Malaysian Qualifications Agency (MQA). On top of that, 13 programmes – i.e. CeMBA, CeMPA, as well as 6 business and 5 technology degrees – have received recognition from the Public Service Department (JPA) following the graduation of its inaugural batch of students.

This case study shows how a young and innovative university such as WOU has been able to transform its course development processes from a 'wrap-around

textbook based' model using courses it bought from the Open University of Hong Kong to an Open Educational Resource (OER) based course development model, and as a result achieving three positive outcomes in one stroke. These were substantial cost reduction in course development and delivery, quality enhancement from the use of a variety of multimedia OER and increased internal capacity building for innovative course design and development. The two models for Course Development, namely the 'wrap-around model' using OER, and the 'stand-alone model' based on copyrighted books nevertheless, exists at the University, side-by-side.

This case study describes the experience of developing and delivering one of WOU's courses based almost entirely on available Open Educational Resources as part of adoption and implementation of an OER policy and Open Educational Practices in the university. This was one of the pioneer courses which sought to adopt a new course development policy eliminating the use of copyrighted material. Schools of Studies were urged to use, reuse or repurpose available OER or create their own OER and the University is now in the process of revising all its copyrighted textbook based courses as well as courses bought from other universities.

OER Integration Initiative at WOU

Wawasan Open University has been a pioneer institution in the region to respond to the global advocacy for the OER movement. The OER-Asia initiative started in 2010 was carried out under the auspices of the University for advocating and disseminating relevant information about OER as well as developing training materials and conducting research in this area. OER-Asia as well as the University made concrete contributions to the drafting of the World OER Declaration jointly by the Commonwealth of Learning and UNESCO. Wawasan Open University in spite of being a new organisation took the bold decision to join the OER movement.

In December 2010, the Council of the Wawasan Open University asked the University to consider and develop a proposal for possible adoption of OER and bring out a detailed implementation plan in order to transform the existing course development process with an aim to increase the quality and efficiency of developing course materials.

The Management of WOU responded promptly to the directive of the WOU Council by initiating actions to systematically plan and implement the use and integration of OER in course development in the University. The University procured services of a senior professional with expertise in ODL and OER to kick start OER adoption activities in the University and lead the university in institutionalising the innovation and making it an entirely e-Learning university.

A group comprising new staff and existing champions in the university took the lead in supporting the process of OER adoption. An OER Steering Committee was constituted with participation of all schools of studies and academic support departments to plan and monitor the process.

A part of this transformation comprised rethinking various pros and cons of OER development. A discussion paper titled **'OER Integration in WOU-Policy Directions, Strategic Outputs and Action Plan'** was drafted and this was discussed in several forums including the OER Steering Committee which was constituted for the purpose of formulating further plan of action (see Menon, 2012). After lengthy and extensive deliberations an OER Policy for WOU was drafted for consideration and approval of all governing bodies of the University. The OER Policy for WOU with implementation strategies has been adopted by the OER Steering Committee, Senate, and Management Board, and endorsed by the Board of Governors of the University.

The broad OER Policy declaration is that *"WOU will promote and implement the creation, reuse, remix, repurpose and redistribution of Open Educational Resources (OER) within an Open Licensing framework"* (WOU-OER Policy, 2012). Based on this OER Policy the University also formulated an Open Licence Policy (2012) with CC-BY-NC-SA as the license for all selected course ware. It will also develop guidelines for using and mixing OER with varied open licences to make sure that legally accepted norms and standards are uniformly practiced in the University.

In the past one and half years WOU has made substantial progress in this area. One of the initiatives is the use of Open Educational Resources in the construction of its learning materials for a course on *'ICT in Education'* (2012) which is part of the M.Ed. Programme. This case study offers a summary of this experience in the development of this course by reusing and repurposing OER materials.

Programme/Course Specific Information

'ICT in Education' is a 5-credit (200 study hours), one semester (6 months), compulsory course designed for students who are enrolled in the **Masters in Education** programme of the School of Education, Languages and Communication (SELC) of WOU. Given the large number of OER in this area of study, WOU identified this course as one of its two pilots to demonstrate the feasibility of developing its learning materials by reusing and repurposing multimedia reusable learning objects (OER) drawn from the World Wide Web that were appropriately licensed. This course was identified as the course content itself was on ICT for preparing teacher educators.

The course aims at developing in the learners the required knowledge and understanding of ICT related concepts, inculcating skills of using this knowledge

in enhancing learning achievement as well as developing reflective and decision making abilities in planning and implementing ICT applications at micro and macro educational situations.

By the end of this course all learners are expected to achieve the following learning outcomes:

- Demonstrate knowledge and understanding of ICT related concepts.
- Demonstrate the skills of using ICT in enhancing learning achievement.
- Analyse the characteristics and scope of ICTs as tools for teaching and learning.
- Discuss the use of ICT's to effectively support the delivery of lessons in different disciplines.
- Elaborate the policies, planning and challenges in using ICT in education.

The course is organised into five units and twenty-two sub-units covering topics on Information and Communication Technologies (ICT) in Education.

Instructional Strategy

The course material uses multimedia resources including texts, streamed video, podcasts, audio-visuals such as pictures, diagrams, etc. This multimedia content was developed by the integration of the OER on an eXe platform. The finished product was made available to students on a CD. It was also uploaded to WOU's LMS viz. *WawasanLearn*. *WawasanLearn* has web components such as templates for content pages, discussion forums, quizzes and exercises to engage learners while they practice with the course material, acquire new material and engage with tutors and fellow students. *WawasanLearn* can deliver learning content and resources and provide seamless access to tutors and other learners for them to "meet" and interact with each other as well as tools for assignment submission, discussion and taking quizzes.

Course Structure and Development Processes

The OER material developed follow a design based on WOU's house template with minor modifications. The course is divided into Units and Sub-units. The Course Guide provides the course overview, course outcomes and other guidelines for learning. Each Unit begins with an introduction, unit outcomes and unit summary. Each sub-unit also has an introduction, outcomes and summary. The subunits consist of 2-4 sections/sub-sections and these include various inbuilt learning activities to ensure that the expected learning process takes place leading to the expected learning outcomes. These learning activities have been designed to follow a model of situated learning given that this is a course for
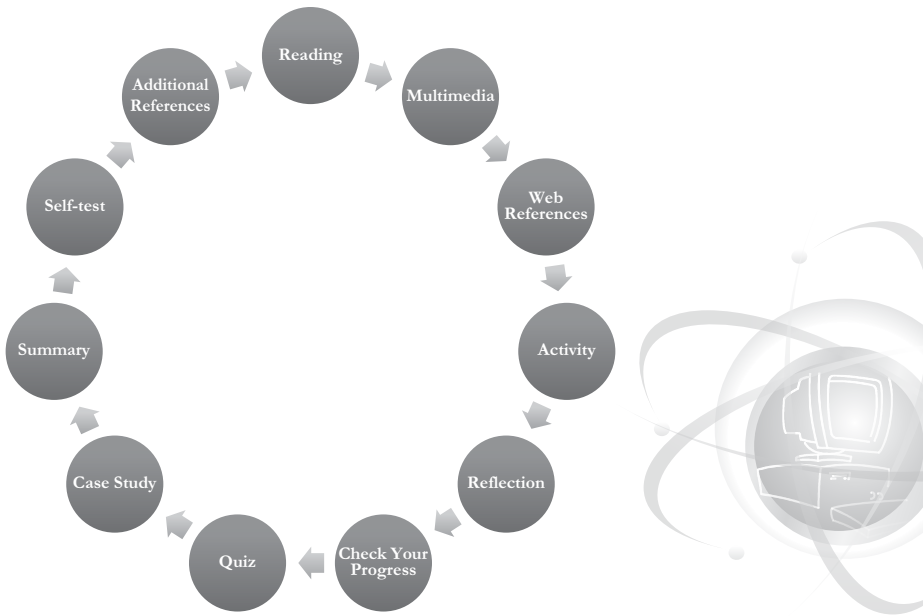
Figure 4.1: Learning Activities Used in the Material

professional development of teachers. In the best traditions of good pedagogical practices course writers wrapped instructions around the OERs to guide students in their learning.

This course is designed to help students move easily from the stated objectives, to the required learning activities with appropriate logical sequencing so that each learner will be able to go through a process involving experiencing, applying, reflecting and conceptualising in an individualised manner. Figure 4.1 presents the many kinds of learning activities included in each sub-unit of the course. In addition the learners have to complete two tutor-marked assignments (TMAs) and take a final examination. The assessment process will expect students to learn and fully utilise the course materials, read extra materials related to this course, discuss topics of interest with peers and tutors, demonstrate comprehension of the concepts learnt, integrate course concepts and knowledge with learner's own experience and observations and apply course concepts to a variety of situations.

In all sub-units of the course material the learning activities given in the figure are appropriately included to facilitate learning. The course uses all types of OER materials such as book chapters, conceptual and research articles, case studies, visuals, streamed video and podcast for supporting learning. The course materials were developed by reusing and re-focussing suitable OER materials which were put through the normally adopted quality assurance and formative evaluation processes followed in the University which consists of a number of steps. Course materials development in WOU is governed by a rigorous procedure with strict adherence to a code of practice for academic quality assurance and standards
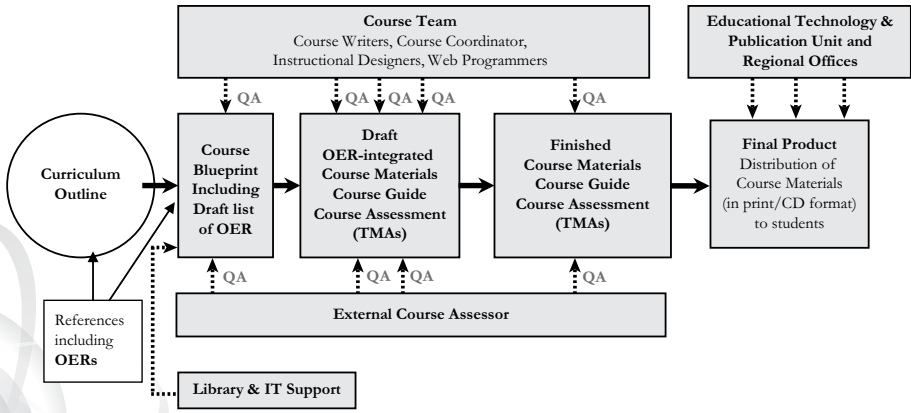
Figure 4.2: QA Processes in OER Integrated Course Development

(WOU, 2012). This process involves a number of important stakeholders. This was followed with the required modifications to suit the special QA requirements while using OER. **Figure 4.2** presents the QA processes followed by WOU in an OER integrated course development practice.

Even with the identification and adaptation of relevant OER materials in developing course materials, QA processes as indicated in **Figure 4.2** would be applied to ensure academic quality and integrity. However additional quality measures would need to be imposed when using OER materials to develop courses.

It is important to refer to all available resources including OER rather than only referring to one or two standard textbooks while formulating the curriculum. With the formalisation of the course blueprint, the Course Coordinator (CC) or course writer (CW) will be tasked to identify the relevant OER materials for each unit/topic based on the prescribed learning outcomes of the course. This comprises three simple steps where:

a. CC/CW will identify and shortlist reputable and peer-reviewed OER repositories upon discussion with the Course Development Team (CDT)

b. CC/CW will then locate the relevant materials from the OER repositories agreed by the CDT with due consideration given to the copyright license of the materials

c. CDT will then assess the quality and relevance of the OER materials collated before finalising and confirming the OER materials that will be adapted or used to develop the course content of the specific courses.

The faculty in association with the course writers developed a Blueprint based on the curriculum approved by the Malaysian Qualification Agency. The blueprint

included a draft list of OERs and other resources identified for use in the Course. Course materials were developed by the four course writers from within WOU who were responsible for the development of the course. The draft materials were reviewed by the Course Coordinator (CC) and edited for design compliance by the Instructional Designer (ID) before it was subjected to a review by the External Course Assessor with regard to content correctness, suitability of OER used and effectiveness of the learning activities. The course writers revised the materials based on the remarks of the ECA and further modified by the CC and the ID. The final draft version was subjected to language and copy editing. The course package created contains 22 sub-units which are available as individual Reusable Learning Objects with CC BY NC SA licence for external use which again makes this material unique.

Challenges Faced

The following are challenges faced by the course team in the reuse of OERs in the present course:

a. *Quality of available OERs on the internet:* There are different types of OERs with texts and multimedia materials available on the web ranging from peer reviewed journal articles, books and chapters by known publishers, to blogs by known and unknown authors in the field. This type of heterogeneity in the resources posed a major problem for the course team in terms of choices. In view of this there was an immediate need to develop quality indicators of identifying appropriate resources by users. These indicators would include additional criteria including searchability, content correctness and extent of openness of OERs.

b. *Combining resources with various types of licences:* This was a major challenge encountered by the course team. While the course writers remixed and modified resources which had a CC BY SA licence, in other types of licences with CC BY ND SA, the resources were provided as reference or reading materials without remixing with other resources or mixing with newly created materials. The developed course adopted a CC BY NC SA licence according to the open licence policy of the University, although it was mentioned that the OER resources used in the course will be governed by the licence indicated by individual resources.

c. *Resources not showing any open licence but could be available on request:* The course team found useful resources which were developed with support from multi-lateral organisations such as UNESCO, but with copyright protection. In such cases the team had to write to their authors to obtain permission for copying and using such material. There are a number of resources of this type on the web developed by multilateral organisations or national governments and in many of these cases, the organisations/governments usually do not have

any objection to their use and reuse. However, users of such material cannot consider these as OER unless they carry a CC licence. The Paris Declaration (2012) recommends that national governments should consider giving open licence to all resources developed and produced with public support.

d. *Resources which are modified continually:* There are a large number of resources which are created by a community of authors and are modified regularly. All Wiki resources fall in this category. The Course team made use of a few of these resources either by indicating the date on which the resource was included in the course or by rewriting the content as a new creation.

e. *Use of copyrighted resources openly available on the web:* The course team in very rare cases made use of such copyrighted resources especially some YouTube videos. In such cases links were provided to students for download and use. They were not copied and embedded in the course packages. This of course was not a good solution the resources could be removed by the authors from the site at any time leaving the students stranded. In addition students with slower connections to the Internet may have found difficulty in downloading some of these resources.

f. *Formulation of the curriculum framework:* The curriculum framework already finalised by the Faculty and approved by the MQA had been developed basing on one or two copyrighted textbooks. The course team had very little leverage in modifying the framework to include materials which are more recent and available with open license. This could have been avoided if all types of online materials with different licenses could have been referred while formulating the curriculum framework.

Reflection on OER Integration

The course is divided into 4-5 sub-units. Each sub-unit in the course is developed as a standalone part of the unit to afford portability in the event of further reuse. Digitised OER materials selected for use were anything from book chapters, journals articles, audio and video clips, podcasts from Vimeo and YouTube, and materials published by governments and multi-lateral agencies such as UNESCO.

These were suitably reused and repurposed leading to the creation of Reusable Learning Content (RLC). RLC is defined as *"open educational content designed to be reused, therefore, reproducible, addressable and flexible to be adapted multiple times in multiple ways, in multiple purposes, in multiple formats and in multiple contexts by multiple users"* (Okado, 2010). Each sub-unit of the course has been developed as a RLC and hence the course package has 22 RLCs available for use by others. The course used all the four levels of reusability as defined by Okado et.al. (2012). These are:

- Adopt same content (whole, part or combination)
- Adopt same content, but adapt structure, format, interface or language

- Adapt part of the content

- Recreate content and contribute to new productions

Reflections on Practices

These self-instructional course materials are supported with face-to-face tutorials, and *WawasanLearn* (an on-line system to enhance students' learning from a distance). The range of media materials used, while at times repetitive, is aimed at meeting the different learning styles of our learners. Learners are provided with the expected learning outcomes for each sub-unit and guided to go through essential reading materials, view videos, listen to podcasts, respond to questions, reflect on issues and problems, perform activities and undertake self-test. The learning activities in the units and sub-units are designed to motivate and facilitate learning, and encourage reflective practice. In addition, two tutor marked assignments (TMAs) are given for the learners to work on and submit as part of their assessment requirements. Students can discuss the course materials and TMAs in the tutorial sessions organised five times during the semester. Tutors who are trained to support students in their tasks provide specific feedback to each learner on the assignment submissions.

WawasanLearn offers the facility for learners to interact regularly with their tutors and other learners as well as access additional learning materials including the digital library as well as OER repository online. Learners can contact their tutors and course coordinators through e-mail and telephone as well. Face-to-face support is provided to the students through five sessions of tutorials one for each unit. The tutorials were also done using video conference facility.

Feedback from Stakeholders

The course was pilot-tested with eight students during the July 2012 semester. Reactions of the students were obtained through a questionnaire and intensive discussions in personal interviews. The course material was also reviewed by three external experts. Feedback from learners, external experts and also the internal course team was discussed and appropriate modifications are being carried out. A second version of the course is currently being put together.

Based on feedback received from students and experts, the course units were subject to the following quick modifications.

- Reducing textual information wherever necessary.

- Rechecking the status of CC licenses with respect to materials that are referred.

- Proposing to include on online quiz items.

- Guidelines for students to use online web services.

- Editing of materials to make it free from spelling and grammatical errors.

- Attempts are being made to use tablet with materials loaded with provision for recording the students learning, nature of interactions with materials, peers and tutors.

The modified package will be offered to the new cohort of students starting the course in July 2013. The course writers have started a detailed comprehensive review of the course materials. Systematic feedback on the course package will be obtained from the students registering for the course during the July 2013 semester.

Conclusion

The development of this course is a first attempt in Malaysia and probably in the entire region to create a full 5-credit course by using/reusing/repurposing OERs and open source materials available on the web. All learning activities in the course were developed by the team by repurposing the OERs to achieve the learning outcomes of the course.

Another achievement of this effort was the significant reduction in the course development time. Normally a typical 5-credit course development in WOU takes about 12-18 months. This course with OER use took only 8 months to complete. Use of available RLOs obviously helped in this regard. A further value was added through the reduction of costs especially in the elimination of prescribed textbooks. Finally from the point of pedagogy, this course was rich in multimedia which presented content in formats that suited learners with different learning styles.

This experience has provided us with insights into the reuse and repurposing of OERs and in the development of Reusable Learning Objects. We think the present course materials adopted a new approach for OER creation by reusing/re-purposing available OERs without making changes to them. This would increase the reusability of the entire package. The localisation is provided through locally appropriate 'instruction' and the newly created learning activities. Other users can adopt/adapt these learning activities as well as develop their own.

Acknowledgement

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