

# Strategies for Promoting OER in Course Development and Course Delivery in ODL Environment

Sheng Hung, Chung  
Wawasan Open University  
Penang, Malaysia  
shenghung@hotmail.com

Ean Teng, Khor  
Wawasan Open University  
Penang, Malaysia  
etkhor@wou.edu.my

## ABSTRACT

This study discusses the phases involved for the development of OER-based course materials namely the OER course integration using Wikibooks; evaluation of Quality Assurance (QA) in OER learning content; promoting and exploring OER repositories; CC licensing discussions and establishment of collective feedback sessions at Wawasan Open University (WOU), Penang, Malaysia. The learning design for the computing courses with engagement of learning experiences and feedbacks from different stakeholders in Open Distance Learning (ODL) environment are taken into consideration as one of the major components in the OER-based course development and revision phases. The OER-based computing course comprises of course units, self-test, unit practice exercises, assessments, mini project and activities are delivered in ODL mode in three consecutive semesters span from 2013 till 2014. Evaluations and studies are being carried out at end of each semesters for the by the course team members on the primary aspects focusing on learners' participation rate of OER resources; LMS learners' activities and assessments evaluation. The OER development engagement involved multiple stakeholders (i.e. learners, instructors, course coordinators and External Course Assessors) from different levels aiming to promote the use and understanding of OER in ODL environment.

## Categories and Subject Descriptors

K.3.1 [Computers and Education]: Computer Uses in Education – distance learning.

## General Terms

Designs, Experimentation, Performance.

## Keywords

OER, course development, course delivery, quality assurance, collective feedback sessions.

## 1. INTRODUCTION

Hilton et al. (2010) indicated that the development of digital materials movement has encouraged users to re-use, revise, remix

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

*OpenSym '14, August 27 - 29 2014, Berlin, Germany*

Copyright is held by the owner/author(s).

Publication rights licensed to ACM.

ACM 978-1-4503-3016-9/14/08...\$15.00.

<http://dx.doi.org/10.1145/2641580.2641633>

and redistribute resources through appropriate tools and made available through Creative Commons (CC) licensing. According to research conducted by Hilton et al. (2010), the four "R's" is the key donor for increases of the openness of an OER by reuse, redistribute, revise and remix. Conole (2012) defined that adopting open practices as the ability to encourage lateral thinking and new perspective and creativity in learning. During the OER-Asia initiative in 2010, WOU aims to promote and transform existing course development process by integration of OER for ODL environment. The OER course development initiative was put forward in 2012 with the introduction of the WOU OER policy as follows:

*"WOU will promote and implement the creation, reuse, remix, repurpose and redistribution of Open Educational Resources (OER) within an Open Licensing framework" (Chung and Khor, 2013)*

The outline of this research study presents as following: The first section introduces the development concept of the OER course development framework using WikiBooks. The second section discusses the OER development model mainly Creation, Evaluation and Production phases. Quality Assurance (QA) implementation is included during evaluation phase by course development team to ensure quality of the course units and Creative Common Licensing. The key findings are presented in the third section and forth section. The final section describes the conclusion in the OER course development and delivery study.

## 2. OER COURSE DEVELOPMENT MODEL

The Figure 1(a) below illustrates the development model of the OER course development which includes three main phases mainly creation, evaluation and production phase. The three phases were undertaken during July 2012-December 2012 by OER course development team. Interim reports and unit evaluations are produced in the development period. Figure 1(b) depicts the development model employed for revision phase during the course delivery span from January 2013 – July 2014.

In Figure 1(b), collective feedback sessions were held in completion of the course study in each semester which includes performing interviews and surveys for review of the OER course unit's content. The learners provide recommendations and views based on learning experience gained to be incorporated in the revision cycle. In addition, feedback from instructors for delivering the OER courses will be used to evaluate the continued use of the material for subsequent presentations.

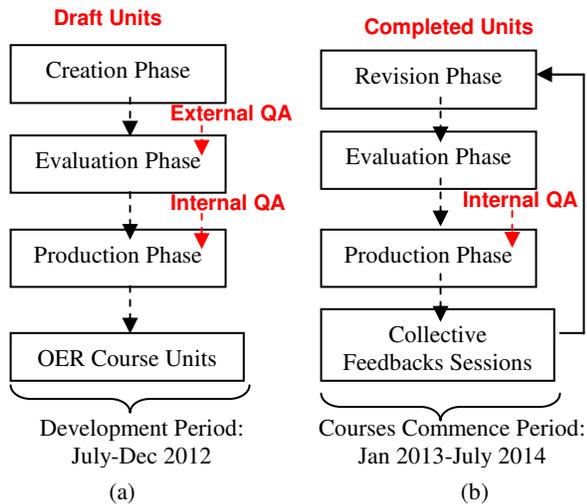


Figure 1. Process Flow of OER Course Development and Revision.

### 3. CONTEXT OF STUDY

The three OER-based courses were offered to distance learners from six remote regional centers namely: Kuala Lumpur, Penang, Johor Bahru, Kuching, Ipoh during the three semesters (*Semester I: January 2013-July 2013*, *Semester II: July 2013- December 2013* and *January 2014-July 2014*) with course evaluation and collective feedbacks sessions carried out at the end of each semesters to perform data interpretation and learning component evaluations. The study presents the feedbacks and evaluations from two stakeholders namely distance learners and External Course Assessors (ECA) from subject background as illustrated in Table 1, Table 2 and Table 3. The OER-based course development and course delivery aims to provide validation of academic descriptors for OER specialist in creation phases involved during OER-based learning materials development and promotes the engagement of open content effectively in the ODL environment.

In Table 1, the course development and delivery for TCC121/05 have been conducted smoothly within the estimated duration (6-8 months) and the OER course materials were uploaded to the LMS to support participant’s learning in the course. The ECA evaluated the five units’ course materials covering computer concepts and skills, problem solving through objects and Java programming. In this OER-based course, learners are exposed to the key concepts of object-oriented programming and the Java language and adequate external OER resources were provided to extend and apply the student’s learning.

Table 1. TCC121/05 Programming Fundamentals with Java OER-based Course Development and Delivery

<b>Course Delivery History</b> Date of first presentation: (semester & year) • Semester (Jan 2013) Course delivery in six remote regional centers namely: Kuala Lumpur, Penang, Johor Bahru, Kuching, Ipoh, Kota Bahru	<b>OER Course Development History</b> • OER Integration (Semester July 2012) • Rre-write as OER materials to be presented in January 2013 • 5 units of OER integrated materials
---	--

**Explanatory notes on course development (ECA, Prof Andrew Lui, OUHK)**

- The re-write that has been planned for January 2013 semester has made the course material up-to date with integration of OER WikiBooks.
- The units are updated with the latest Java programming software (JDK 7, JCreator LE v.5.00).
- The re-write course includes more updated hands-on programming activities in Unit 1, 2, 3, 4 and 5.

In table 2, the evaluations provided during course development by ECA in the aspect of Copyright Licensing explained that the course development process undertaken was satisfactory and the course team was eager to improve the quality of course design, content, and writing through OER integration. The explanations of copyright and other course development issues are put forward throughout the entire development process.

Table 2. TCC241/05 Database Programming OER-based Course Development and Delivery

<b>Course Delivery History</b> Date of first presentation: (semester & year) • Semester (Jan 2013) Course delivery in three remote regional centers namely: Kuala Lumpur, Penang and Johor Bahru	<b>OER Course Development History</b> • OER Integration (Semester July 2012) • 3 units of standalone write up • 2 units of OER integrated materials
<b>Explanatory notes on course development (ECA, Prof Andrew Lui, OUHK)</b> The course covers fundamental SQL which should be useful for students to revisit them before embarking on the rest of the journey. The course is of a high technical nature and students are to study how to perform certain operations with database programming. From this perspective, the course should be able to satisfy the aim. This course would be complemented by other courses that cover database program design issues, if otherwise students would have fewer opportunities to apply the skills.	

In Table 3, the ECA concluded that the course is well designed with sufficient information provided in each unit. It provides extra reading references and each unit is filled with exercises and case studies. This course is found to be suitable for the students at the undergraduate level to help them understand the reengineering process of software.

Table 3. TSE304/05 Software Scalability and Reengineering OER-based Course Development and Delivery

<b>Course Delivery History</b> Date of first presentation: (semester & year) • Semester 1 / 2014 Course delivery in two remote regional centers namely: Kuala Lumpur and Penang	<b>OER Course Development History</b> • 2 units of standalone write up • 3 units of OER integrated materials
--	--

**Explanatory notes on course development (ECA, Associate Prof Dr Masrah, UPM)**

The course is designed to give an understanding on scalability and expose the students to reengineering activities in the maintenance phase of software development life cycle. In general, all units are well written with clear explanations and examples and each unit has given its comprehensive overview. In addition, this course also discussed on dependability engineering, which is not normally included in any software engineering course. Each unit of this course is associated with self-tests, activities and exercises. These exercises help the students to apply the theories they have learnt. In addition, the reading references given in each unit can help the students gain extra knowledge in the respective topic.

**4. FINDINGS AND DISCUSSIONS**

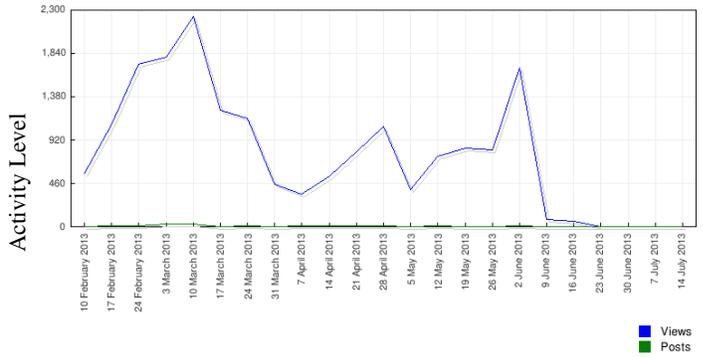
The assessment strategy in the OER courses namely TCC121/05 Programming Fundamentals with Java, TCC241/05 Database Programming and TSE304/05 Software Scalability and Reengineering are presented in Table 4 below:

**Table 4: Assessment Strategy**

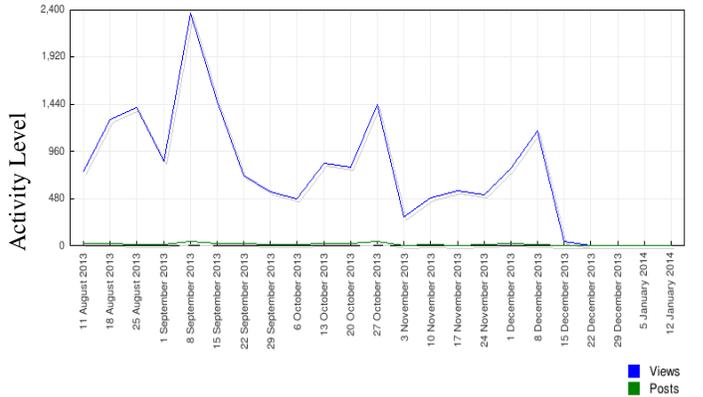
Type	TCC121/05 Programming Fundamentals with Java	TCC241/05 Database Programming	TSE304/05 Software Scalability and Reengineering
TMA 1	25%	25%	25%
TMA 2	-	25%	25%
Mini Project	25%	-	-
Final Examination	50%	50%	50%

**4.1 Key Findings: Activity in LMS-Moodle**

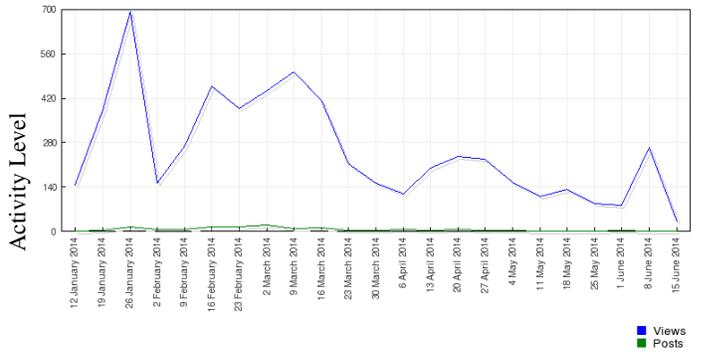
The pattern of access and activity by the course participants are observed in *January 2013*, *July 2013* and *January 2014* semesters as depicted in Figure 2(a)-(c). Learners who engage in the courses in each semester were found to participate actively in the forum discussion in *WawasanLearn LMS*- WOU Moodle Learning Environment. It was observed that the interactions of users concentrated on assessment discussion, explanations of exercises and course unit’s revision (tutorials) which held on monthly basis in each regional centres. Participants’ progress were monitored in the *WawasanLearn LMS* and it was found that they participated quite actively in the forum discussion as shown in Figure 2(a)-(c). The learners obtained supports from the peers and instructors in the completion of their assessments (TMA1, TMA 2) and Mini Projects through forum views and posts. The external OER resources and recommendation of OER repositories for corresponding subject topics were also provided in *WawasanLearn LMS* as additional references and supplementary aids.



**Figure 2(a): January 2013 Activity Report (Views and Posts)**



**Figure 2(b): July 2013 Activity Report (Views and Posts)**



**Figure 2(c): January 2014 Activity Report (Views and Posts)**

**4.2 Key Findings: Survey on OER-based Course Learning Experiences**

The Collective Feedback Sessions as mentioned in Figure 1(b) in Section 2 defines a core mechanism of evaluation phase to cater the identification of errors and follow-up actions. The survey and interviews were carried out with the participants at the end of each semester which comprises the following *Research Questions 1-5*:

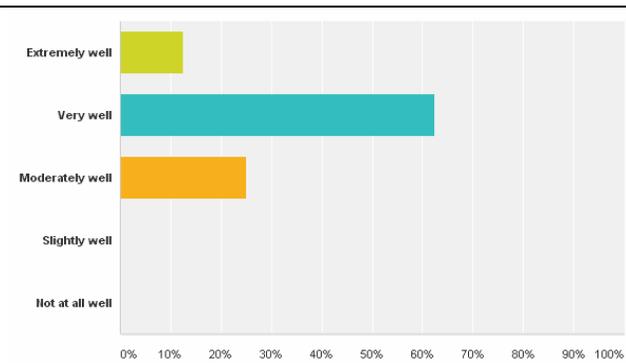
### Research Questions 1-5:

1. How well does this OER Course Material (Unit 1-5) meet its objectives?
2. What characteristics would you consider to determine the quality of OER or open textbook?
3. Which Unit(s) of the OER course materials were most useful?
4. What is your understanding on OER course material or open textbook?
5. What are the most important features should be incorporated into OER course material?

The initial findings derived from the OER course participants presents the survey results as shown in Figure 3(a)-(e).

#### Research Questions 1

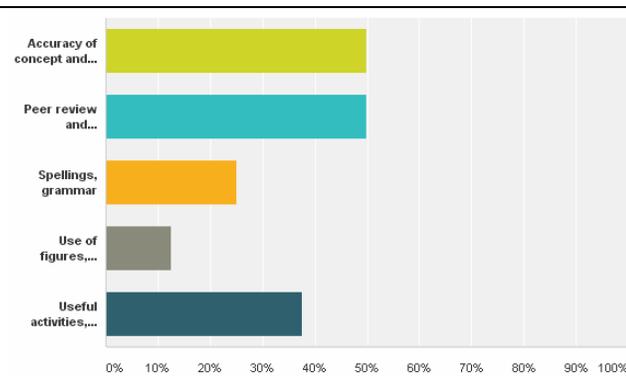
*How well does this OER Course Material (Unit 1-5) meet its objectives?*



**Figure 3(a): Objectives Evaluation of OER-based Course Materials**

#### Research Questions 2

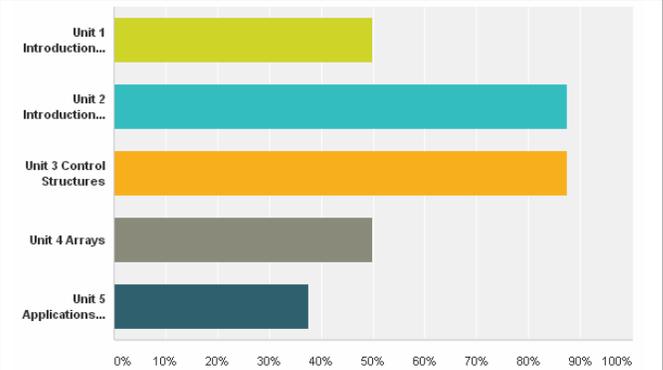
*What characteristics would you consider to determine the quality of OER or open textbook?*



**Figure 3(b): Quality Evaluation of OER-based Course Materials**

#### Research Questions 3

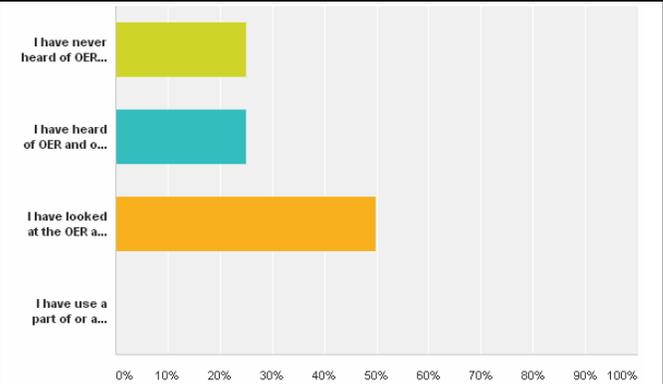
*Which Unit(s) of the OER course materials were most useful?*



**Figure 3(c): Units Evaluation of OER-based Course Materials**

#### Research Questions 4

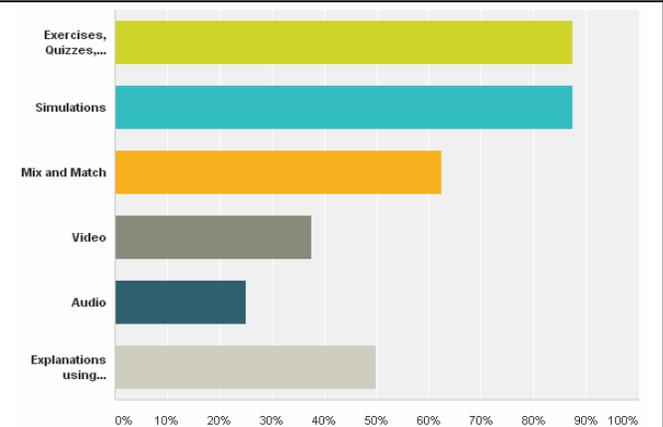
*What is your understanding on OER course material or open textbook?*



**Figure 3(d): Understanding of OER-based Course Materials**

#### Research Questions 5

*What are the most important features should be incorporate into OER course material?*



**Figure 3(e): Features Evaluation of OER-based Course Materials**

## 6. CONCLUSION

The OER-based course development initiative is undertaken in Wawasan Open University (WOU) during course units write up and the revise of course materials specifically for computing courses. The presented study and feedbacks from the outcome of course development and de-livery are useful for implementation of creation, reuse, remix, repurpose and redistribution of OER in open licensing framework in the future and aiming to broaden the accessibility of OER usage for student's learning.

## 7. ACKNOWLEDGMENTS

The authors would like to thanks the WOU course development team for TCC121/05 Programming Fundamentals with Java, TCC241/05 Database Programming and TSE304/05 Software Scalability and Reengineering during the OER course development phases.

## 8. REFERENCES

- [1] Hilton, J., Wiley, D., Stein, J., and Johnson, A. (2010) "The four R's of openness and ALMS Analysis: Frameworks for Open Educational Resources." *Open Learning: The Journal of Open and Distance Learning*. 25 (1): 37-44. (Taylor & Francis Version, Open-Repository Version).
- [2] Ean-Teng, Khor and Sheng-Hung, Chung. (2013). Framework for the Development of OER-based Learning Materials in ODL Environment. *Open Praxis*, 5(4), 315-324.
- [3] Conole, G. (2012), *New Approach to Openness – Beyond Open Educational Resources*, OER Knowledge Cloud, University of Leicester, 1-24.
- [4] Fitzgerald, B. (2007), *Open Content Licensing (OCL) for open educational resources*, Proceedings for OECD Centre for Educational Research and Innovation (CERI), 1-25.
- [5] Burgos Aguilar, J. V., Cox G., Czerniewicz L., D'Antoni S., Diallo B., Downes S., Farrow R., Friesen N., Hodgkinson-Williams C., Kanwar A., Kinuthia W., Kodhandaraman B., Kreijns K., Lane A., Lee-Pan S., Luo A., Mackintosh W., Marshall S., McAndrew P., McGreal R., Montoya M. S. R., Ng'ambi D., Paskevicius M., Sampson D. G., Schuwer R., Shaikh S., Siemens G., Sotiriou S., Taylor J., Umar A., Van Acker F., van Buuren H., Vermeulen M., Thuo(Kariuki) C. W., Wright C. R., Yamada T., and Zervas P.: (2013). *Perspectives on Open and Distance Learning: Open Educational Resources: Innovation, Research and Practice*, Commonwealth of Learning, Athabasca University, May 2013.