One-on-One Approach for Open Online Courses
Focusing on Large-Scale Online Courses

Masumi Hori[1], Seishi Ono[2], Kazutsuna Yamaji[3] and Shinzo Kobayashi[4]
[1]*TIES Support Division, Tezukayama University, Nara Prefecture, Nara, Japan*
[2]*NPO CCC-TIES, Nara Prefecture, Nara, Japan*
[3]*Research and Development Centre for Academic Networks, National Institute of Informatics, Tokyo, Japan*
[4]*CEO, SmileNC & co., Tokyo, Japan*

Keywords: Open Education, Large-Scale Online Course, e-Books, e-Learning, GakuNin.

Abstract: Large-Scale Online Course (LSOC) requires stable and low-cost services and special learning and teaching methods because numerous learners are generally studying on a course for free. This paper proposes Learning Support System (LSS) using e-book with an access management federation designed for LSOC. The proposed LSS reaches the solution to a flipped teaching and one-on-one approach of the massive learner using e-book, which is a new e-portal alternative to a web.

1 INTRODUCTION

Recently, the utilization of Massive Open Online Courses (MOOCs) are increasingly attracting attention. MOOCs are an emerging tool of open education that allows anyone who wants to participate to freely study on the Internet. It is estimated that hundreds of thousands of students enroll in MOOCs (Lewin, 2012). Ivan Illich predicted in "Deschooling Society" that the Information Computer Technology would provide an equal opportunity of open education (Illich 1971). The activity of MOOCs was initially influenced by his philosophy.

Large Scale Online Course (LSOC) like MOOCs have the potential to bring revolutionary change to education, especially higher education because of this equal opportunity.

However, LSOC including MOOCs face challenges in motivating learners and managing system operation because the existing Learning Support System (LSS) are limited by conventional technology and methods. Therefore traditional LSS do not meet the evolving specifications of LSOC.

This paper discusses a new LSS that combines the benefits of e-books with an Access Management Federation (AMF). This LSS will facilitate one-to-one learning on LSOC even when there are hundreds of thousands of learners.

2 LSS FOCUSING ON LSOC

The differences between LSOC and traditional courses that utilize e-learning systems include scale (number of learners) and cost (fees). It is estimated that hundreds of thousands of students initially take a MOOC at no cost (Carr, 2012). LSOC should meet the following requirements.

- Provide a stable operation for online courses for numerous learners
- Secure sustainable revenue for free open online courses
- Provide efficient methods to motivate learners for self-study.

As Hill points out (Figure 1), MOOCs have barely addressed significant educational problems relating to revenue models, credentialing, accreditation, course completion rate, and learner authentication (Hill, 2012).

Therefore, LSS designed for LSOCs require the following.

A) Stable and Low-Cost Service:
Stability and afforadable services are essential for a course having large numbers of learners. Therefore it is imperative that the LSS should be able to integrate with different media platforms.

B) Learning Methods Selected by Learners' Intentions:
The LSS should provide diverse learning

Hori M., Ono S., Yamaji K. and Kobayashi S. (2013).
One-on-One Approach for Open Online Courses - Focusing on Large-Scale Online Courses.
In *Proceedings of the 5th International Conference on Computer Supported Education*, pages 177-182
DOI: 10.5220/0004413401770182

methods chosen on the basis of the individual learner's intentions, such as receiving their evaluation of learning outcomes and accreditation or credit.

C) One-to-One Approach:
The LSS should provide one-to-one relationship that is unrealizable in traditional classroom between a teacher and a large number of learners.

3 LSS ON MOOCs

Existing LSOCs like MOOCs are insufficient for the three above mentioned reasons. Here are several significant examples of LSOC. The activities of MOOCs include two distinctive learning models of cMOOCs and xMOOCs (Siemens, 2012). cMOOCs are based on the idea of Web2.0 with interactive learning between educators and learners on the internet. cMOOCs provide the learning environment of the social network between educators and learners by utilizing existing internet resources such as wiki, blogs, and social networking sites like Twitter and Facebook.

xMOOCs follows the method of conventional e-learning and provides online courses with its original learning support system.

Both LSSs have their distinctive challenges.

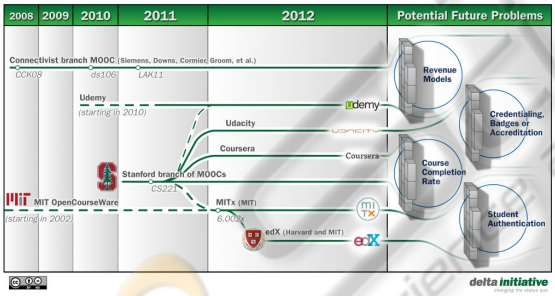

Figure 1: The Two Branches of MOOCs. (HILL, 2012).

3.1 For Stable and Low-cost Service

As explained above, a cMOOC creates LSS in combination with the existing available service on the Internet such as social network service and provides its online courses without own LSS for 1.5 million learners (Carr, 2012).

In principle, the idea of cMOOC is effective for providing a stable and affordable LSOC because it is not dependent upon a particular network infrastructure.

xMOOCs which have their own LSS, provide courses through their own original service. As such, xMOOCs require substantial investment and face difficulties in providing stable operations. Actually, Coursera experienced a partial outage caused by its AWS's system failure in October 2012 (examiner.com, 2012). The accident impacted close to million users and clearly presented a significant challenge.

3.2 Learning Method Selected based on Learners

LSS's concepts of cMOOCs and xMOOCs are incompatible. Hence learners can select neither learning support systems nor learning methods, according to their learning purposes.

cMOOCs have an advantage in their stable and low-cost LSS. However, this LSS cannot be utilized to evaluate learning outcomes. cMOOCs are indifferent to learning assessment, accreditation, and credit, even though they are interested in dissemination of learning.

In contrast, xMOOCs can be utilized to evaluate a student's learning outcomes and grant credit. They follow the method of conventional e-learning and provide online courses with its original LSS. In this regard, Siemens, as one of the early developers of cMOOCs, criticizes xMOOCs as merely traditional learning using lecture videos and quizzes.

LSS designed for LSOC should be capable of dealing with any kind of LSOC even if LSOC has different methods of implementation.

3.3 One-on-One Teaching

Many LSOCs such as cMOOCs and xMOOCs have functions making it possible to create a one-on-one relationship between the educator and the learner on chat, live video, and SNS.

One-on-one approach is an essential function of the LSS and should be carefully examined. The existing LSOC that both an educator and teaching assistants teach numerous learners is not truly one-on-one teaching. One-on-one teaching should be that one educator teaches one learner.

4 DEVELOPING THE LSS USING E-BOOK

The LSS designed for LSOC requires the functions that allow for a stable and low-cost operation; learning methods based on learners; and a one-on-one approach between an educator and a learner.

The authors developed the new LSS using e-book that is a substitute for web interface.

4.1 LSS using e-Book

LSS using e-book has the following characteristics:

- The inherent functions of e-books allow various formats such as html, video as well as contents or learning topics on online courses to be packed into one book.
- e-Books can provide online course content through different media including web, mail, portable electric devices and e-book store.
- e-Books have high discoverability on the Internet, including assigned Digital Object Identifier (DOI).

Our newly developed LSS based on e-book have the following advantages.

1) Standardization:
   e-book structure inherited from traditional books has an established standard. In addition, e-book format has an established standard like epub format.
2) Portability:
   e-Book is readily portable.
3) Using varied the Internet resources:
   e-Book can provide diverse learning environment tailored for each learner combining use of learning contents and Internet resources such as SNS.
4) Content distribution:
   e-Book provides online courses through a variety of ways such as e-library, e-book store, websites, and e-mail.
5) Flipped Teaching:
   Learners freely can edit distributed contents of e-Book created by an educator. And this e-book will be prevalent in the LSOC community worldwide (Figure 2).

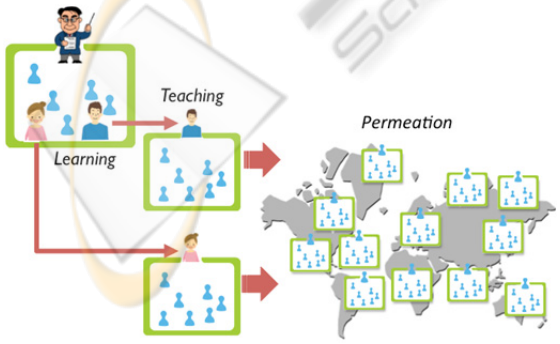

Figure 2: Flipped teaching.

6) Diversity of access methods:
   Learners study online courses by various access methods regardless if there is the Internet access or not.
7) One-on-One approach:
   The environment for conducting one-on-one approach is easily implemented by simply adding the application.

The authors designed LSS based on e-book by utilizing the formerly mentioned advantages (Hori 2101). Figure 3 below shows the concept of LSS.

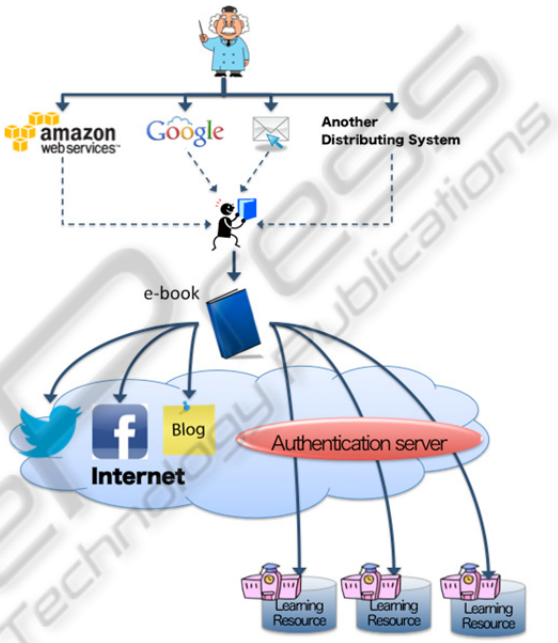

Figure 3: An Online Course Portal by e-book.

4.2 Three Essential Components for the LSS

LSS based on e-book consists of three essential components.

1) Discoverability:
   DOI, an element of metadata of network information resources, which overcomes URL's limitations like temporariness, attempts to identify digital media on various levels such as paragraphs, sentences, and figures. The assignment of a DOI makes it possible to identify learning resources of online courses.
2) Flipped Teaching:
   DOI name prefix can be assigned to each "flipped teaching" community within a LSOC. Each community can assign DOI numbers to their e-books. Herewith, discoverability and traceability are expected in these e-books thus guaranteeing product quality.

3) Learners Authentication:
As previously mentioned, e-book with academic AMF realizes low-cost and high reliability user authentication.

4.3 Access to Academic AMF

The specification of student's learning resource is necessary for the evaluation of student's learning outcomes. In this case, student authentication is required. For example, the proctors on Coursera monitor learners via a mix of webcams and `keyboard dynamics' for strict authentication (chronicle.com, 2013). However, the authors will develop a low-cost system with the Access Management Federation (AMF) to evaluate learning outcomes.

The authors adopt a common authentication platform that the National Institute of Informatics (NII) promotes the Academic AMF in Japan (GakuNin) (Yamaji et al., 2010).

The Academic AMF in Japan consists of both users (universities) and producers (publishers) of academic e-resources. By mutually implementing rules and policies stipulated by the Federation, organizations can easily access each other.

A user's authenticated account of each authorized participant in GakuNin is issued after verifying its identity, which is guaranteed by the participants, including higher education institutes.

4.4 Creating Microlecture Contents

The authors have introduced a one-minute lecture video (microlecture) as the method to motivate learners (Figure 4).

Figure 4: Example for microlecture.

Microlectures are brief lecture videos focused on key concepts and are widely utilized by Khan Academy and TED-Ed. EDUCAUSE cites microlectures as a new educational approach (EDUCAUSE, 2012).

Microlectures allow learners to be free of time constraints, increase completion rates, and generate a sense among learners that they are receiving a face-to-face lecture via mobile.

4.5 Flipped Teaching on e-Book

Table 1 by Gende shows roles of both teachers and learners in the process of creating a textbook based on e-book (Gende, 2012). For example, in the learner-centric approach, learners are involved in making the textbook in Research and the Inquiry; while teachers are also involved in Topic Selection and Essential Questions. The same process happens when creating e-books. Thus, learners can add and revise in e-book provided by an educator in the process of the Inquiry or the Research.

The learner may become the teacher and create a new learner's community and redistribute the e-book to other learners who belong to the community. The learner has developed a deep understanding of educational contents thus contributed to the enhancement of the educational quality.

Table 1: Teacher and Learner Roles (Gende, 2012).

	Traditional	Structured	Guided	Learner Directed Inquiry	Learner Research Inquiry
TOPIC SELECTION	Teacher	Teacher	Teacher	Teacher	Teacher/ Learner
ESSENTIAL QUESTIONS	Teacher	Teacher	Teacher	Teacher/ Learner	Learner
AGGREGATION	Teacher	Teacher	Teacher	Learner	Learner
CURATION	Teacher	Teacher	Teacher/ Learner	Learner	Learner
CREATION	Teacher	Teacher/ Learner	Learner	Learner	Learner

4.6 One-on-One Approach based on e-Book

One educator has to handle diverse requests and intentions of numerous learners to create a one-on-one approach on LSOC. It is so challenging that many LSOCs depend on various means such as SNS and teaching assistants. In contrast, LSS based on e-book with AMF and DOI should make flipped teaching possible which can then enhance the quality of education. This LSS will lead to

cooperation and collaboration between educators and learners on the Internet. A number of small communities based on one-on-one relationships can be formed.

5 THE CHiLO PROJECT

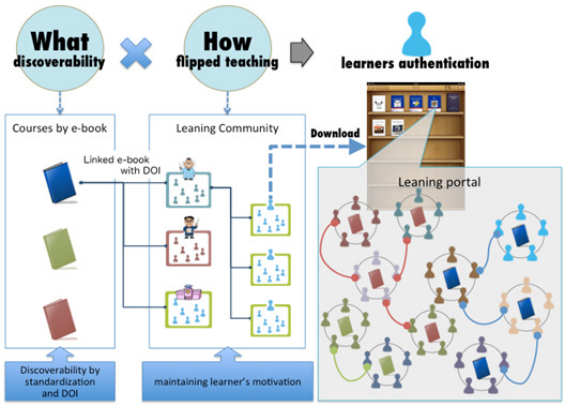

Figure 5: The CHiLO e-book distribution.

A Creative Higher Education on the Learning Open Course (CHiLO) is a new project for Open Online Course in Japan. Within this project, the authors of this paper aim developing new LSS based on e-book, which is called a CHiLO Book. In this LSS, e-book will consist of microlectures (Figure 4) and will provide authentication services endorsed by the GakuNin (Yamaji, 2010). Additionally, this e-book will be granted DOI to ensure discoverability and traceability. Finally, the CHiLO Book will contain varied Internet resources to replace website (Hori 2012).

These elements will realize flipped teaching, which may facilitate the creation of several small communities of learners in the LSOC (Figure 2). As a result, these the goal of one-on-one teaching will be achieved (Figure 5).

The CHiLO Book, which is distributed in these small communities, will continue to develop the educator-to-learner or learner-to-learner link and further promote mutual understanding of educational contents.

6 CONCLUSIONS

LSOCs hold the potential of resolving the challenge attaining educational equality and changing traditional pedagogy.

The authors propose an LSS based on the e-book, which will maintain learners' motivation, evaluate their learning outcomes, and provide stable and low-cost access.

LSS facilitates a one-on-one approach, provides diverse learning methods and environments chosen based on an individual learner's intentions, and utilizes the flipped teaching to enhance educational quality. This method also ensures learner authentication by using academic access management federation. Such functionality meets all requirements of LSS designed for LSOC.

ACKNOWLEDGEMENTS

The authors thank the members of the Education Support Office (ESO), Musashi Academy for their assistance and advice. The authors are grateful to Brian Masshardt, Ph.D., and ESO Academic Coordinator for his careful proofreading and useful comments. The authors also thank Yuka Ito, ESO Assistant Coordinator for her extensive translation and useful advice.

REFERENCES

Carr, N. 2012 , MIT technology Review. *The Crisis in Higher Education*. Available from: <http://www.technologyreview.com/featuredstory/429376/the-crisis-in-higher-education/>.

chronicle.com. The Wired Campus 9 January 2013. *Coursera Announces Details for Selling Certificates and Verifying Identities*. Available from: <http://chronicle.com/blogs/wiredcampus/coursera-announces-details-for-selling-certificates-and-verifying-identities/41519?cid=at&utm_source=at&utm_medium>.

EDUCAUSE 2012. *7 Things You Should Know About MICROLECTURES*. Available from: <http://net.educause.edu/ir/library/pdf/ELI7090.pdf>.

examiner.com 2012. 22 October 2012. *Coursera goes down leaving almost one million users stranded.* Available from: < http://www.examiner.com/article/coursera-goes-down-leaving-almost-one-million-users-stranded >.

Gende, D. 2012. *How to Create Your Own Textbook — With or Without Apple.* Available from: <http://blogs.kqed.org/mindshift/2012/01/how-to-create-your-own-textbook-with-or-without-apple/ >.

Hill, P. 2012, e-Literate. 24 July 2012. *Four Barriers That MOOCs Must Overcome To Build a Sustainable Mode.* Available from: <http://mfeldstein.com/four-barriers-that-moocs-must-overcome-to-become-sustainable-model/>.

Hori, M., Ono, Kobayashi, Yamaji & Kobayashi 2012,

TIES e-Portal2.0 Trials for Making Innovations in Open Education, 6th International Conference on Project Management.

Illich, I 1971, Deschooling Society: Social Questions, 1st, HarperCollins,London.

Lewin, T. 2012. 'Instruction for Masses Knocks Down Campus Walls', *The New York Times* 4 March. Available from: <http://www.nytimes.com/2012/03/05/education/moocs-large-courses-open-to-all-topple-campus-walls.html?pagewanted=all>.

National Institute of Informatics, GakuNin- Academic Access Management Federation in Japan. Available from: <http:// www.gakunin.jp/docs/en/fed/about>.

Siemens, G. 2012. *Elearnspace*, 25 July 2012. *MOOCs are really a platform* . Available from: http:// www.elearnspace.org/blog/2012/07/25/moocs-are-really-a-platform/.

Yamaji, K., Nakamura, Kataoka, Nishimura, Shoji, Orawiwattanakul, Sonehara & Okabe 2010. *Japanese Access Management Federation GakuNin as an eResearch Collaborative Infrastructure, Open Conference Systems*, eResearch Australasia 2010.