

## ***Prototyping a new open education platform offering e-book based courses linked to Moodle with federated authentication***

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### **Abstract**

Since 2012, new large-scale open educational courses have been offered in the form of Massive Open Online Courses (MOOCs) like Udacity, Coursera and edX. Our Tezukayama Internet Educational Service (TIES) offers learning support systems platform combined with e-books, Moodle and Academic Access Management Federation by Open Source License via Large Scale Online Courses (LSOC) like MOOCs under an open source developed community.

This paper introduces the learning support systems platform utilizing Moodle modules and the community called Creative Higher Education Learning Object (CHiLO).

### **Keywords**

Open Education, Large-Scale Online Courses, e-books, Moodle, GakuNin, MOOCs

## **Introduction**

Tezukayama Internet Educational Service (TIES) provides distinctive TIES e-learning system as educational portals for its own community members. Founded in 1996, the educational TIES community is now comprised of 83 universities across five countries and regions (Nakajima, et. al, 1999; Nakajima, Hori, 2011). The members collaborate e-learning systems and their educational contents including online courses. At the same time, they share them for the purpose of open education.

Recently, Large-scale Online Courses (LSOC) like Massive Open Online Courses (MOOCs) have become a hot movement where millions of learners take online courses and are issued a certificate upon completion (Lewin, 2012; Siemens, 2012; Parr, 2013). Currently, several universities are planning to acknowledge the certificates of MOOCs as valid course credits in their educational programs (Young, 2012).

Online platforms for LSOC, including open-source systems like the platform used by edX, are being actively developed and are becoming the key factor for a successful open education service. However platform development is costly (and must be continually updated) to meet diverse needs of learners.

In consideration of the situation mentioned above, we have decided to develop and release a new open-source LSOC platform that is intended as an alternative to TIES e-learning system (Hori, Ono, Kobayashi, & Yamaji, 2012; Hori, Ono, Kobayashi, & Yamaji, 2013). We expect the existing and emerging open-source communities will provide platform sustainability. The new platform offers e-books based courses linked to Moodle with federated Shibboleth authentication by GakuNin (Academic Access Management Federation in Japan). It is designed to serve a handy, effective and secure open education platform.

## Developing a LSOC Platform Using E-book and Moodle

### Designing for Large-scale Online Courses

To designing our system, we analysed the data obtained from a real experiment with open courses involving 30,000 learners in 2008 (Hori, Ono, Yamaji, & Kobayashi, 2013). As the result, we found that most users in the open education environment were familiar with conventional textbook based learning style and they were not willing to make efforts to learn for themselves. They just watched a part of the video in the content for a short time and roamed the site.

Therefore we decided to design an e-book based platform as the characteristic of e-books seemed to fit the open education environment (Gende, 2012). E-books also have a good potential to be able to access the Internet by utilizing the HTML5 features, thus allowing access Moodle activity modules from e-books (Figure 1).

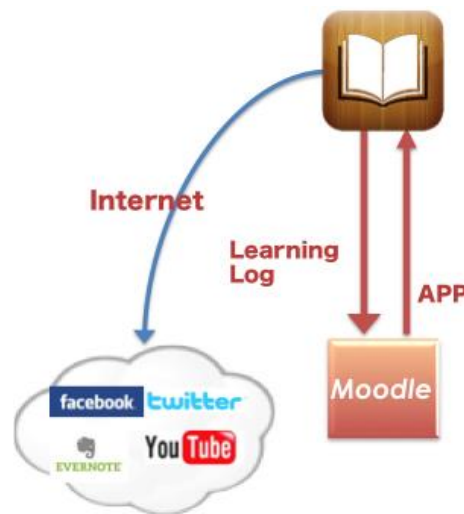
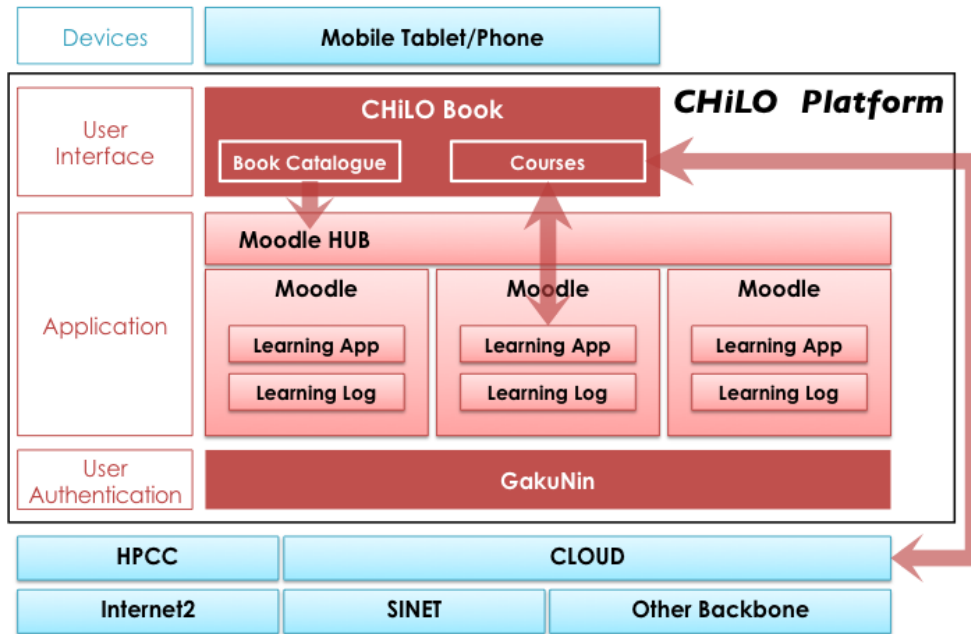


Figure 1: E-book accessing the Internet and Moodle

### Basic configuration of our LSOC platform

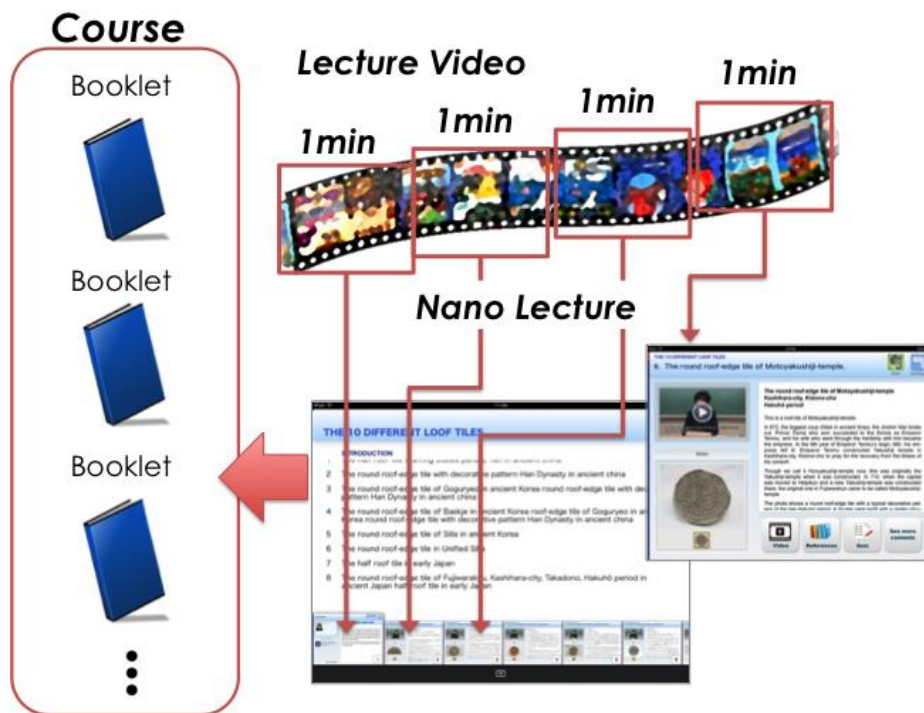
Figure 2 shows the block diagram of the LSOC platform we have developed. In consideration of possible heavy accessing load by a large number of users, several Moodle servers under the federated Shibboleth authentication by GakuNin (National Institute of Informatics, 2013 ; Yamaji, Nakamura, Kataoka, Nishimura, Shoji, Orariwattanakul, Sonehara & Okabe,2010) are employed. We call our LSOC platform CHiLO (Creative Higher Education Learning Object) and the user-interface e-book as a CHiLO Book.



**Figure 2: Outline of our LSOC platform**

### Design of our e-book

In the CHILO Book, we create one-minute videos (nano lectures) assembled in a booklet so that the learners can watch the course video at several different times (Figure 3). The booklet corresponds to an individual lecture, and one course includes a series of CHILO Books consisting of 10 to 15 booklets.



**Figure 3: Lecture Video in the CHILO Book**

## CHiLO Book as a sub element of a Moodle course

As shown in Figure 4, a CHiLO Book is embedded in a Moodle course that is posted in a Moodle Hub. In the Moodle Hub learners search for a CHiLO Book and download it from the Moodle site of the organization that provides the CHiLO Book. Through the CHiLO Book, the learners can access the assignment submission modules, choice modules and quiz modules in the Moodle site.

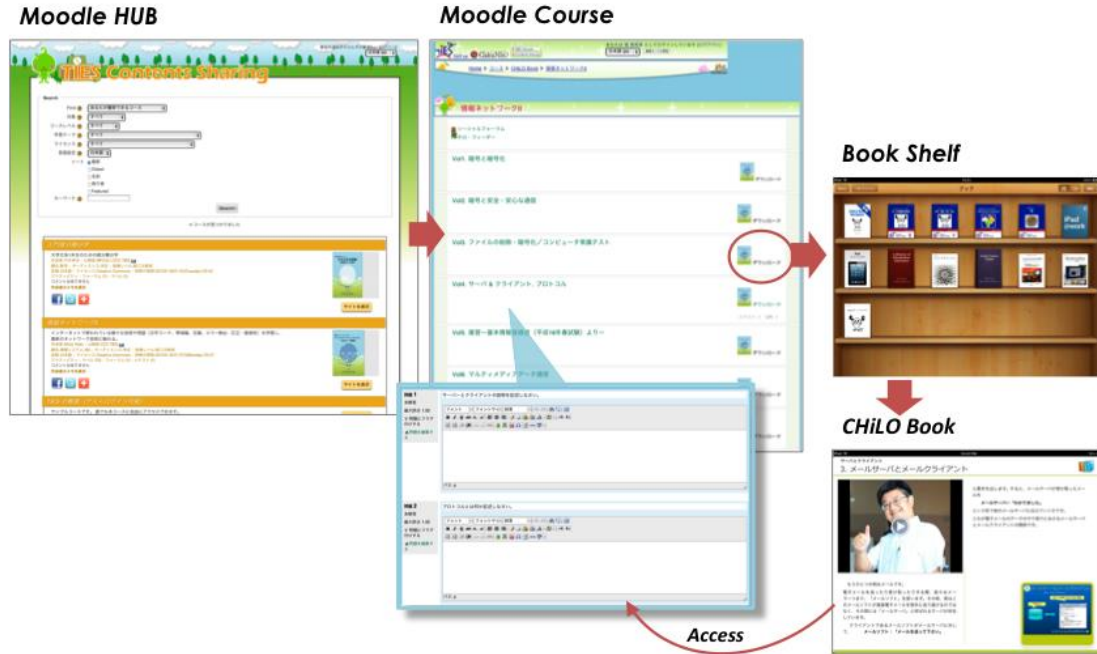


Figure 4: Linking of the CHiLO Book and the Moodle site

## Proposal of a community-driven open education: the CHiLO Project

We released CHiLO Book and the package of our developed Moodle modules (Figure 5) under an open-source license, hoping that CHiLO platform can be easily introduced into many organizations and that the open-source communities of researchers and engineers will contribute to the growth of open education.

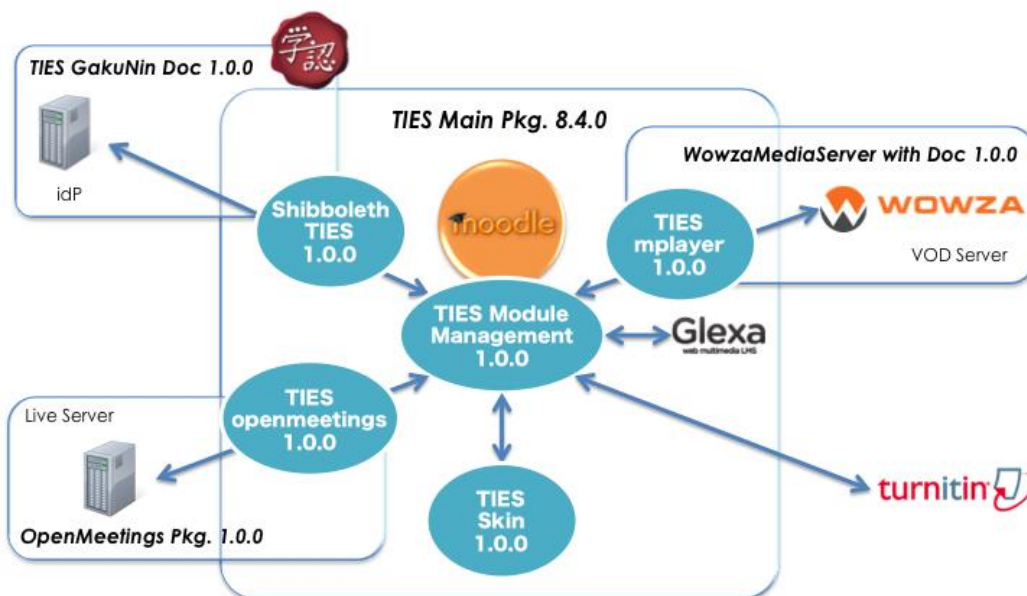


Figure 5 Moodle modules developed for this project

## Conclusion

The current version of CHiLO platform is designed to be used with iBooks. In future updates, Android device support will be added by making it more compatible to ePub standards. The Moodle add-on for connecting e-books to Moodle sites will also be developed. Through the further development and revision, CHiLO platform will be OS-independent and CHiLO Books can be delivered through various sites like iBookstore, Amazon and Google Play. As the user identity of each CHiLO Book is verified by an academic access management federation like GakuNin, the certificate badge to the learner will be awarded directly to the learner (Figure 6).

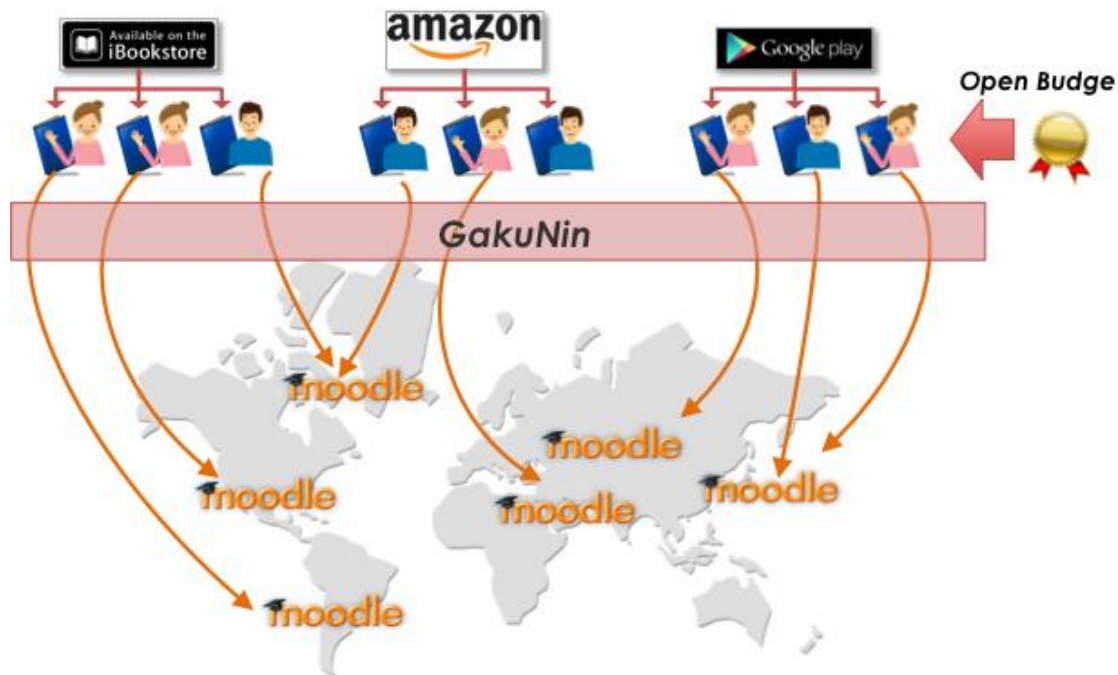


Figure 6: CHiLO as the connecting platform for e-books and Moodle

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