

TIES e-Portal2.0 Trials for Making Innovations in Open Education

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Abstract

Tezukayama Internet Educational Service (TIES) provides distinctive *TIES e-learning tools* as educational portals for its own community members. The TIES educational community is now comprised of 83 universities across five countries and regions. The members share the e-learning systems and their educational contents including online courses. At the same time, they disclose them for the purpose of Open Education.

We reviewed the e-learning tools and expanded their functions. And then TIES mashes up the various kind of educational contents in a new *TIES Smart Text Book (TSTB)* for realizing *Cooperation-Sharing-Disclosure* of higher education. We will provide a new type of education portal with the use of TSTB. It is completely different one from conventional web-based ICT education and e-learning ones, in that it packages professors' knowledge as e-books.

TSTB is a kind of revolutionary tool for sharing and distributing and disclosing contents in education. It may also lead innovation for a business enterprise.

Keywords& Phrases: Learning objects, Content distribution, Metadata, Teaching materials Development, e-books, Open courses, e-learning, Identity management

1. Introduction

In 1996, three professors of the Faculty of Economics at Tezukayama University started a small project for Open Education. They brought teaching materials such as lecture notes and spreadsheet files and disclosed them on the web [1]. At that time in Japan, these activities were very rare. So Microsoft KK kindly donated servers, after the account appeared in newspapers. The donation in 1998 is the starting point of the project with five universities, Konan University, Kwansei Gakuin University, Seikei University, Musashi University, and Tezukayama University. The aim was "*Cooperation-Sharing-Disclosure*" of university education. It finally became Tezukayama Internet Educational Service (TIES) community. This educational community started from the grass-roots level and has grown to 83 universities in five countries in 2011 [2].

TIES e-learning tools were originally developed from the idea of Web 2.0. It enables educators to contribute contents on the web and offers highly qualified education as accumulated knowledge. TIES regards this system as educational portals.

In May 2006, TIES community created a new NPO called CCC-TIES. This is the framework for systematical support for the community. The supporting activities lead to accelerate the activities of TIES community and advance the educational capabilities of the members.

After CCC-TIES fundamentally reviewed *TIES e-learning tools* and reexamined web-based educational portals, it developed a new type of educational portal based on e-books.

2. The Current Situation and Challenges of Open Education

OCW

OpenCourseWare is a movement for voluntarily disclosing internet-based lectures at higher education institutions. There have been various contents opened since the launch of MIT OpenCourseWare in 2002 [3]. The MIT course is the most representative open course with respect to the large-scale distribution and the numbers of users. Like that of TIES, the purpose of OCW is to distribute contents; however, it is limited to be an open free publication of formal course materials of universities on the Internet.

OER

Open Educational Resources (OER) was adopted by UNESCO in 2002 [4]. The Learning Resource Metadata Initiative (LRMI) co-led by Creative Commons and the Association of Educational Publishers (AEP) started in 2011 [5]. It is similar to content distribution and its utilization of TIES; however, it remains in providing learning objects.

Khan Academy

The Khan Academy is an open course created in 2006 by individuals. The distinctive feature is to supply short lectures, or micro-lectures, of significant ideas that merit distribution [6]. Unlike TIES, Khan Academy was organized by individuals (not institutions) and has no aspects of quality enhancement of education through collective knowledge or collaboration.

MOOC

Massive open online course (MOOC) was coined in 2008, by Dave Cormier of the University of Prince Edward Island [7]. This is a massive open online course where 1.5 millions people participate. MOOCs have some well-known groups like Coursera, Udacity and edX. Coursera is a for-profit educational company founded by Andrew Ng and Daphne Koller from Stanford University. Udacity is a private educational company founded by Sebastian Thrun, David Stavens, and Mike Sokolsky. edX is a joint venture initiated by the Massachusetts Institute of Technology and Harvard University [8][9]. MOOC also has a function as Web2.0 in the respect of utilizing diverse tools on the Internet and utilizes web-based educational portal as a tool in order to distribute online courses to learners.

TIES

The vision of TIES is to break through the framework of Japan's exclusive and obsolete university education, by providing university lectures to the public and enhancing the quality of education at respective universities. It also enables higher education institutions to offer and disseminate high quality education to the world, through promoting sound and worldwide competition and evaluation. Figure 1 shows this vision.

Additionally, in order to share respective contents and practice distinctive education, the members of TIES community utilize e-learning tools offered by CCC-TIES as web-based educational portals. Educators can accumulate these educational contents in shared libraries and disclose them for Open Education, if they so choose.

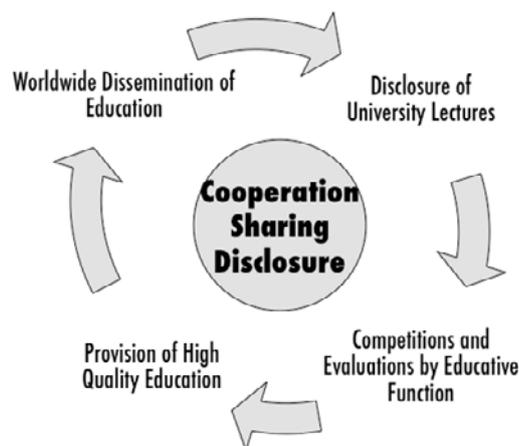


Figure 1 TIES's Breakthrough

3. Problems

There is already a diverse range of Open Education and any institution can distribute online courses by utilizing web-based educational portals. The web-based educational portal has the advantage of enhancing educational opportunities for many people; however, tremendous resources for the development of distribution are required. It means organizations only having financial strength can distribute such online courses.

Simultaneously, it is difficult to try to improve the learning effect for online learners by disclosing formal course materials of universities on the Internet.

4. Proposal for Open Education Infrastructure using *TIES Smart Text Book*

In order to resolve these problems and spread a movement for Open Education, we tried to develop Open Education Infrastructure using e-books.

The e-books mashed up educational contents as media-rich. Additionally, they completed it by embedding a WebAPI Widget that allows student-to-teacher and student-to-student communications and a

course certificate function. It called *TIES Smart Text Book (TSTB)*. While the current TSTB utilizes the functions of Apple iBooks Author, the operations for more widespread implementation can be performed.

It is not merely an e-book. Conventional e-books do not differ extensively from digitized books. In addition, there are few e-books that contain rich content. TSTB embeds rich contents such as pictures, videos, presentation, online access and enables students to attend a lecture as if reading a book. The e-book itself becomes an academic course. As a result, utilizing TSTB is considered innovative.

There are two innovations by embedding open courses in e-book. The first innovation is improvement of mobility. By packaging as e-books, students can download from mobile terminals such as tablet devices thereby allowing them to attend a lecture at any time and from anywhere. The TSTB seeks to provide university lectures to the public more than web-based open courses do. The Smart Text Book makes it possible for students to carry university lectures in a bag and access them at any time. Students attend a lecture all the time as well as select a favorite part of lectures, like reading a book.

The second innovation is derived from the characteristics of e-book. In conventional web-based open courses, a multi-step procedure was necessary to boot up a computer, start up the browser and select a bookmark; whereas in the TSTB allows a lecture to be pulled from a bookshelf of mobile tablet in a single operation.

While students turn a page, they rapidly comprehend their learning range and freely and immediately come and go in the course embedded in e-book wherever they like. Students can also study from the opposite direction if so desired. Of course, this is considered general function of a book, but as a lecture, such a function is not general. Such a paradigm shift may lead to improvements in lectures. It seems that conventional web-based open course was able to provide the same service but the operability of web essentially differs from that of e-books. This same simple operation cannot be performed on the web.

Naturally, as open courses, interactive communication is generated. In networked environment, a student can freely communicate with another student as well as a teacher by embedded communication functions. Students can attend a live lecture through e-book when it is necessary. Furthermore, as a by-product for maintaining an appropriate form as books, the review and circulation of e-book represents the course evaluation. Such functionality means that e-book itself becomes the classroom. The significant difference between TSTB and e-books is that TSTB has an explicit intention to make the closed classroom accessible to the public.

These functions may significantly influence the net generation proposed as stated by J.S. Brown [10]. This gives substantial hope to NEET (Not in Employment, Education or Training) and “Hikikomori” who refuse to venture out of their houses and appear to have a diminished motivation to study [11].

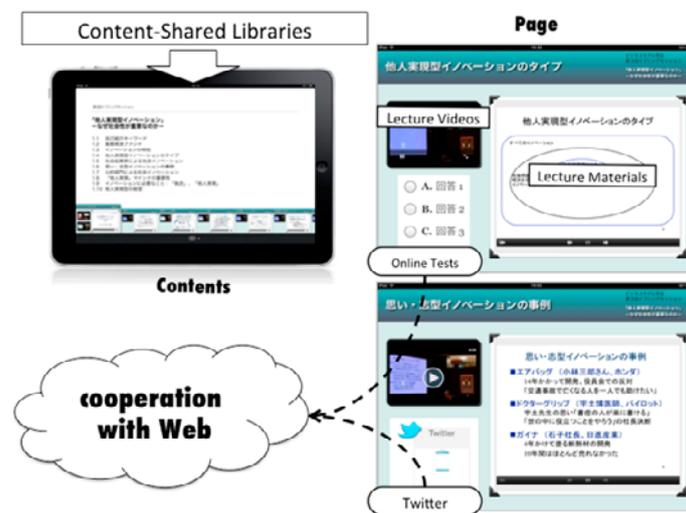


Figure 2 TIES Smart Text Book (TSTB)

Figure 2 shows how TSTB as a mixture of lecture materials and videos accumulated in content-shared libraries becomes like an e-book. Furthermore Twitter functions for exchanging information by students as well as WebAPI Widget of online test for course certificate can be added.

To this point, students studied by accessing the web-based educational portals of TIES, but henceforth they can study by ‘reading’ TSTB. We provide free TSTB skeletons and WebAPI Widget for using it. As such, individuals or institutions can freely mash up accumulated educational contents and provide them for students.

5. Proposal for e-learning tools to expand the functions of TSTB

The authors reviewed e-learning system for expanding the functions of TSTB. In this system, the most significant feature is that the educational portals are no longer served as web-based portals but TSTB. Figure 3 expresses this specific architecture.

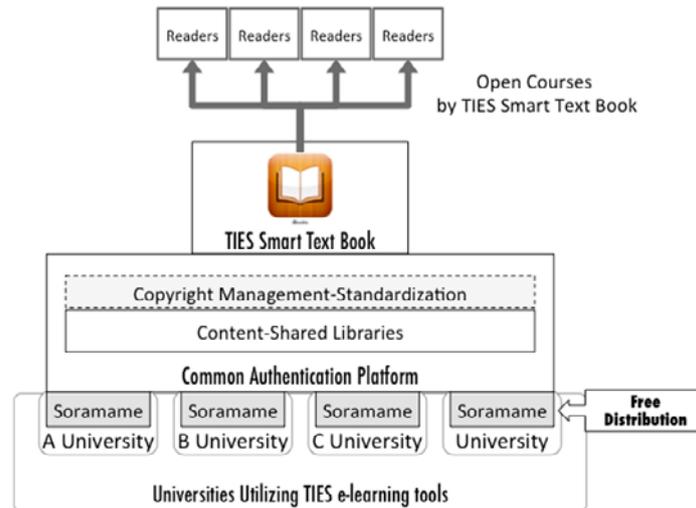


Figure 3 TIES Architecture

Distributed Systems

The new e-learning tools, named *Soramame* is constructed as an open source Moodle. Herewith *Soramame* itself is offered voluntarily to universities and research institutes as an open source.

The universities and research institutes that utilize *Soramame*, can autonomously manage and operate it as well as customize it to their educational programs accordingly, thus allowing them to offer original educational services. Additionally, TSTB can call the functions of e-learning in *Soramame*.

Hitherto, all members of this community conducted educational activities by accessing the same web site as educational portals, but henceforth each member can access to a web site offered by each *Soramame* or TSTB.

Content-shared Libraries and Quality Assurance of Contents

In content-shared libraries, *Soramame* dispersed and installed at each university enables the educators to independently register educational contents deemed as sharable. In this case, Creative Commons owes the copyright of the educational contents. As a result, we retrieved educational contents in content-shared libraries and packaged them as media rich e-books.

We manage and standardize the copyright of the educational contents, for conducting widespread sharing of the educational contents. We define it as "quality assurance of contents".

For promoting quality assurance of contents in *Soramame*, the types of the educational contents are categorized as follows in Figure 4.

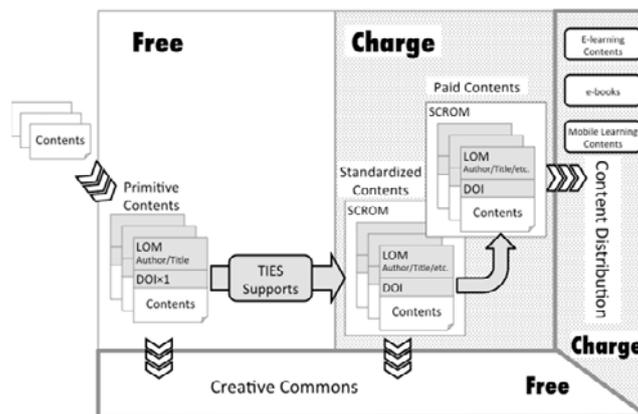


Figure 4 TIES Content Distribution System

The educational contents are divided into 'primitive' and 'standardized' contents. Primitive contents grant minimal metadata such as Digital Object Identifier (DOI) and identify a title or an owner (author). The educator can register educational contents instantly in content-shared libraries.

First, in TIES community, it is possible to implement sharing of the primitive contents. Second, TIES provides institutions or people who do not utilize the TIES e-learning tools with the TIES educational contents. In this case, the CCC-TIES grants detailed metadata, such as contents schemas, fields, and keywords and creates SCORM-compliant contents. These standardized contents lead to accomplish the sharing-distribution-disclosure of educational contents beyond the TIES community.

The standardized educational contents are available in TSTB.

Common Authentication Platform

We have enabled TSTB to utilize the e-learning functions and the shared materials of *Soramame* by implementing the method for using authentication and authorization infrastructure.

Furthermore, adopting a common authentication platform will allow an institution to participate in Japanese academic access management federation named GakuNin [12]. GakuNin is deploying federated identify in Japanese higher education by means of the SAML 2.0 standard [13] mainly utilizing Shibboleth middleware [14]. In the GakuNin, single sign-on for web applications can be achieved by performing authentication at the user's home organization called identity provider (IdP) and authorization at the service provider (SP). It entered production operation in 2010, and has grown today to 41 IdPs and 80 SPs. TIES Common Authentication Platform can be as one of the IdP by joining to the GakuNin, consequently, variety of SPs offered via GakuNin such as mailing list, file sharing and scheduler are available as their collaboration tools. These functionalities will also accelerate the communication between TIES participants.

6. Conclusion

Education is high-quality and high-density information. Therefore, on the web of 'infosphere,' we have offered educational portals where educators can create, store and distribute educational contents. We have promoted the educational portals where educators distribute and mash up educational contents on the web and herewith offer a high quality education based on the concept of Web2.0.

The authors believe that everyone could provide education by the technology of Web 2.0, but it is nothing more than education provided under the vision of some prestigious higher education institutions with financial strength. This situation is the same as disseminating information on the internet under a vision of Google and Apple.

The development of TSTB engenders an appreciable revolution. TSTB can distribute high-quality and high-density education with minimal resources.

TSTB is a new kind of open courseware tool based on the idea of e-Portal2.0 (Figure 5). We aim at widespread dissemination of TSTB at individual websites and even at popular e-book stores. In that sense, we distribute free TSTB skeletons and WebAPI Widget. Also our next goal is making the Certificate System by TSTB for learners authenticated by GakuNin.

The completion of this system will enable widespread applications. It will be an excellent tool not only for contributing to the revolution of Open Education available in higher education institutions under e-Portal2.0 but also for offering high-quality, quick distributions and low-cost educational tools and educational courses for project management to business enterprises.

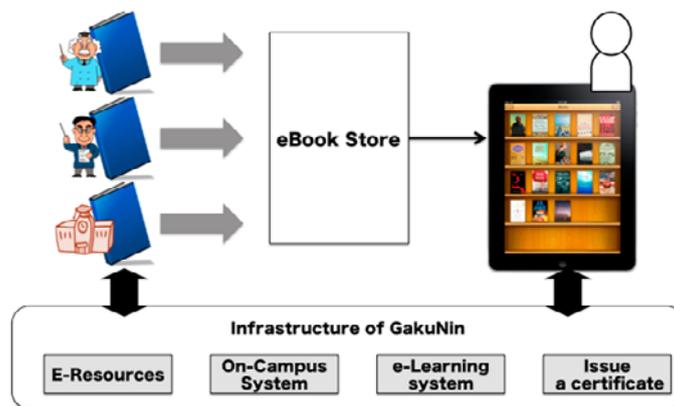


Figure 5 TIES Portal 2.0

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References

- [1] Nakajima,K,et.al(1999):*The Impact of Information Technology on the Educational Innovation - Tezukayama University's Internet Educational System :TIES*, TEZUKAYAMA Journal of Business & Economics,vol.21,pp46-96 (in Japanese)
- [2] Nakajima,K, Hori,M(2011):TIES as an Interuniversity eTeachers Community to Promote Open Education, *Asia Regional OpenCourseWare and Open Education Conference 2011 (AROC 2011)*,PaperNo.1
- [3] Thomas,D,Brown,J.S(2011): *A New Culture of Learning: Cultivating the Imagination for a World of Constant Change*, CreateSpace Amazon Company
- [4] Butcher,N,et.al(2011):*A Basic Guide to Open Educational Resources(OER)*, Commonwealth of Learning & UNESCO
- [5] Dichev,C,Dicheva,D(2012): *Is it time to change the OER repositories role?*, JCDL '12 Proceedings of the 12th ACM/IEEE-CS joint conference on Digital Libraries, pp31-34, ACM ,New York
- [6] Young,J.R,et.al(2012):*Rebooting the Academy*, The Chronicle of Higher Education, Washington, D.C.
- [7] Fini,A(2009):*The Technological Dimension of a Massive Open Online Course: The Case of the CCK08 Course Tools*, International Review of Research in Open and Distance Learning, Vol.10,No.10
- [8] Markoff,J(2012):*Online Education Venture Lures Cash Infusion and Deals With 5 Top Universities*, New York Times, April 18, 2012
- [9] Wikipedia Foundation Inc.: *MOOC*, April,2012, <http://en.wikipedia.org/wiki/MOOC>
- [10] Goodman,R,et.al,(2011): *A Sociology of Japanese Youth: From Returnees to NEETs*, Routledge
- [11] Hal Abelson (2008): *The Creation of OpenCourseWare at MIT*, Journal of Science Education and Technology, Vol.17, No.2, pp164-174
- [12] National Institute of Informatics: *GakuNin- Academic Access Management Federation in Japan*, <http://www.gakunin.jp/docs/en/fed/about>
- [13] Security Assertion Markup Language (SAML) V2.0, <http://saml.xml.org/saml-specifications>
- [14] The Shibboleth Project, <http://shibboleth.net/>