13. Study on the Development and Practical Evaluation of Learning Bases Using the Next-Generation Internet Environment

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○ Outline of study results

This study aims to develop and practically evaluate learning bases and the learning environment based on Web2.0 advanced Internet technology, thereby clarifying the usefulness of the Web2.0 environment and technology in improving learning activities, and the usefulness of Web2.0 technology in developing and enhancing the learning environment. As a result of various practices in this study, it was found that learners (users) themselves create new learning content based on Web2.0 and learn in the process of deepening discussions on the details of the content.

1. Background at the time of commencing the study

Web2.0 has attracted attention as a next-generation Internet environment. Web2.0 collectively refers to a new Web environment that is emerging as the one providing services and user experiences surpassing those available under the conventional Web environment (Web1.0). The advancement from Web1.0 to Web2.0 is described in detail by O'Reilly (2005). According to O'Reilly, the major characteristics of the Web2.0 are the long tail, data orientation, the creation of added value by users, perpetual beta version, loose system integration, and provision of software above the level of a single device. Representative products using the Web2.0 environment and technology include Google, mixi, Amazon, iTunes, and RSS.

From the viewpoint of education and learning, some applications in Web2.0 contain a system to urge user participation, which works to enhance the value of such applications (O'Reilly, 2005). When we consider users as learners, the system functions as a community of practice (Wenger, McDermott, and Snyder, 2002; Saito, 2005; Makino and Fukuda, 2005), indicating a high affinity between Web2.0 and learning activities.

So far educational practices using parts of Web2.0 technology have been conducted (Osada, 2004; Yoshizaki, 2006), but they have still only created a system and evaluated the usability thereof; they have not gone as far as evaluating its effects in learning activities.

The website of the National Information Center for Educational Resources (NICER) that the author works for (http://www.nicer.go.jp/) is the core site dealing with all kinds of educational information in Japan. The NICER website is equipped with an educational metadata search function so as to properly display information required by learners and teachers. Each item contains metadata that meet the international standard, Learning Object Metadata (LOM), enabling users to search for information by using the LOM. At present, over 120,000 pieces of

information are registered with the LOM, forming the one and only large-scale set of metadata and educational content in Japan. O'Reilly (2005) states that the database is the core competence of Web2.0. As such, the LOM data of the NICER website is highly likely to function as an effective tool in an advanced Internet environment.

2. Purpose of the study

By developing and practically evaluating learning bases and the learning environment based on the highly advanced Web2.0, this study aims to clarify the following three points:

(1) Whether the Web2.0 environment may serve as media to be utilized for education and learning

(2) The usefulness of the Web2.0 environment and technology in improving learning activities

(3) The usefulness of Web2.0 technology in developing and enhancing the learning environment

3. Method of the study

This study aims to develop and practically evaluate learning bases and the learning environment based on the highly advanced Internet technology of Web2.0, thereby clarifying the usefulness of the Web2.0 environment and technology in improving learning activities, and the usefulness of Web2.0 technology in developing and enhancing the learning environment. Specifically, we decided to examine learning environments based on the Web2.0 environment and technology, so as to seek new learning modes and new ways to utilize digital content. For that purpose, we developed a learning environment to encourage user participation, with the aim of examining how users acquire and enrich their knowledge and create added values. We cited the following as characteristics of Web2.0, in terms of academic features and originality:

・Creation of added value by users: A number of practical studies using message boards and mailing lists have been conducted, but study results have just been released in an incoherent heap of data. There has been no study that has gone so far as to accumulate and compile knowledge obtained by users and learners.

・Loose system integration: Conventional education systems developed so far mostly function independently. The only exception is the link between the NICER and the NIME, which was designed from the beginning. A new system would provide a seamless learning environment, linking various small and light applications to the extent possible.

・Data orientation: The LOM data of the NICER website is the one and only large-scale set of metadata and educational content. A new system would provide a learning environment by making the most of such data.

4. Study results

As a result of various practices in this study, it was found that learners (users) themselves create new learning content based on Web2.0, and learn in the process of deepening discussions on the details of the content. Our activities and the results of each fiscal year are as follows.

In FY2007, we utilized the conventional tool for demonstrations at an elementary school and obtained knowledge on teaching materials and methods necessary for having students share learning content. We conducted a basic survey on how teachers' ICT skills affect students' learning. Furthermore, we conducted demonstrations at a college of technology to examine how learners learn and add additional values to their achievements under a system of user participation and cooperative learning. We also analyzed tendencies of users' statements under an environment where user participation is facilitated.

In FY2008, we presented the results of our demonstrations at the elementary school in the previous year at an international conference. We continued to use the conventional tools for our system. We carried out training on ICT skills, targeting teacher-librarians in particular, and conducted a survey. At the same time we continued our examination of how learners learn and add additional values to their achievements under a system of user participation and cooperative learning, and our analysis of user statement tendencies in an environment where user participation is facilitated.

In FY2009, we presented our findings on tools for collaborative activities at an international conference. We used both the conventional tools and newly developed tools for our system. As a result of the training and survey on ICT skills for teacher-librarians in the previous year, we made an academic report on our findings that teacher-librarians' views of the media closely relate to the guidance they provide for students, concerning the collection and selection of information. We also compiled an academic report on the results of our continued examination of the learner's process of learning and adding additional values, and our continued analysis of user statement tendencies. Furthermore, we developed and reviewed a system to provide data and presented the results thereof at an international conference.

Major academic works

Relevant pages of the database of the Grants-in-Aid for Scientific Research:

http://kaken.nii.ac.jp/ja/p/19700656

Major academic works (The author's name is underlined)

[Scholarly journal papers] (Total: 5)

(i) <u>Toru Fukumoto</u>, "A Promotion of Media Literacy Based on Group Work and Verification between the Source and News Media," *Proceedings of Educational Technologies (EDUTE'09)*, 2009, with peer review

(ii) <u>Toru Fukumoto</u>, "The Development and Evaluation of the Metadata Attaching System with LOM Database," *Proceedings of ICCE2009*, pp.497-499, 2009, with peer review

(iii) <u>Toru Fukumoto</u>, Hidefumi Kikuchi "Research on Teacher-Librarian's ICT Education Skills Using Pathfinder," *Proceedings of SITE (Society for Information Technology & Teacher Education)*, pp.3752-3755, 2008, with peer review

(iv) <u>Toru Fukumoto</u>, "A Promotion for Verification between Source and News Media," *Proceedings of ED-MEDIA*, pp.654-659, 2008, with peer review

(v) <u>Toru Fukumoto</u>, Hidefumi Kikuchi, "Students' Self-Reflection and Information Sharing Practices with Pathfinders," *Proceedings of ICCE2008*, pp.957-958, 2008, with peer review

[Presentations at academic societies] (Total: 9)

(i) <u>Toru Fukumoto</u>, "Practical Media Literacy for Teacher-Librarians by Information Source Search and Comparison," *Study Reports of the Japan Society for Educational Technology*, JSET09-2, pp.117-122, 2009

(ii) <u>Toru Fukumoto</u>, "Practical Media Literacy by Primary Information Search and Group Work," *Study Reports of the Japan Society for Educational Technology*, JSET09-1, pp.341-346, 2009

(iii) <u>Toru Fukumoto</u>, "Trial on Verification of Information Creation Process Based on the Grounds," *Study Reports of the Japan Society for Educational Technology*, JSET08-1, pp.157-160, 2008

(iv) <u>Toru Fukumoto</u>, "Trial on Practical Media Literacy by Primary Information Search," *Study Reports of the Japanese Society for Information and Systems in Education*, Vol.23, No. 1, pp.27-30, 2008

(v) <u>Toru Fukumoto</u>, "Changes in Media Literacy by Primary Information Search – Comparison between Teachers and Students –," *Speech Papers for the 33rd National Conference, Japanese Society for Information and Systems in Education*, pp.260-261, 2008

(vi) <u>Toru Fukumoto</u>, "Trial on Practical Media Literacy for Teacher-Librarians by Primary Information Search," *Study Reports of the Japan Society for Educational Technology*, JSET08-4, pp.103-106, 2008

(vii) <u>Toru Fukumoto</u>, Hidefumi Kikuchi, "Analysis of Teachers' ICT Education Skills Using Pathfinder," *Papers for the FIT 2007 (6th Forum on Information Technology)*, pp.529-530, 2007

(viii) <u>Toru Fukumoto</u>, Hidefumi Kikuchi, "Analysis of Teacher-Librarians' Capacity to Utilize Information Using Pathfinder," *Speech Papers for the 32nd National Conference, Japanese Society for Information and Systems in Education*, pp.164-165, 2007

(ix) <u>Toru Fukumoto</u>, Hidefumi Kikuchi, "Survey on ICT Skills of Those who Took Teacher-Librarian Course," *Speech Papers for the 23rd National Conference, Japan Society for Educational Technology*, pp.841-842, 2007

[Others]
Websites, etc.: Nothing in particular

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