

Practical Study of Instructional Environments for Lifelong e-Learning

Yasushi Ohta¹, Hiroshi Nakano², Kazuhisa Suzuki³, Tsuyoshi Kiyama⁴,
Yuriko Shimizu⁵, Chisato Noguchi⁶, Toshihiro Kita⁷, Hidenori Akiyama⁸

Abstract - Kumamoto University provides an e-Learning program for local citizens called as "e-Learning Station" supported by the Community Contribution Special Support Activities Budget, which was established to promote contributions to the community by national universities.

The e-Learning Station did trial content delivery during spring, 2004, in order to check a system and contents by monitors' responses. Eight open courses are provided on WebCT as a Learning Management System (LMS), and around a hundred citizens participated the experiment. Each participant took one or several courses from "Introduction to Personal Computer", "Office Applications", "Introduction to Computer Science", "Network Security", "Building a Web Page", "IT ethics", "Introduction Course: Computer Structure", and "Introduction to Statistics".

Various kinds of data were gathered, for example, age groups, occupations, motivations, attractions of lifelong e-Learning, and so on. They were investigated statistically and will be shown as some graphs in the paper.

The e-Learning Station has been started from September, 2004, with several improvements from the experiment. The number of courses was increased to about twenty within five fields (not only natural sciences). Moodle is now used as LMS instead of WebCT, where the number of learners is basically unlimited and various customizations of LMS has been done for open courses. The latest results will also be shown in the paper.

Index Terms - e-Learning, Lifelong Learning, LMS, CMS

INTRODUCTION

Kumamoto University provides an e-Learning program for local citizens called as "e-Learning Station" supported by the Community Contribution Special Support Activities Budget. The e-Learning Station did trial contents distribution during spring in 2004. The Community Contribution Special Support Activities Budget was one of the measures that the Ministry of

Education, Culture, Sports, Science and Technology set up to support regional contributions of National Universities. "Kumamoto University LINK (Local Initiative Network Kumamoto) project" that Kumamoto University applied was adopted in 2002. The aim of the project is to constructing the network where knowledge circulates as an infrastructure by connecting the network of Kumamoto Prefectural (The Prefectural government, cities, towns, and villages of the prefecture, elementary and junior high schools, the high schools, and the enterprises) with the network of the university through servers.

The development of contents was started in 2003 as part of "Content development project on the LINK server", and we began trial content delivery at e-Learning Station on March 1 in 2004 to get about 100 students as the result. Moreover, the real management began at the period from September 28 in 2004 to January 31 in 2005.

In this paper, we describe about the delivery system concerning the trial content delivery, contents, a result of the questionnaire which a students responded, and the change point in real management referring to the results of the questionnaire.

TRIAL CONTENT DELIVERY

We report about results of e-Learning system, contents and the questionnaire which the students responded on the trial content delivery at e-Learning Station between March 1 and April 30 in 2004.

1. e-Learning System

The systems introduced in "LINK project" of Kumamoto University are used for the delivery. The trial content delivery was done by mainly using the WebCT [1] server and the Web server. WebCT is a Course management system (CMS) that Murray Goldberg at British Columbia University developed and WebCT Co. develops and sells. It is used worldwide widely in educational institutions.

¹ Yasushi Ohta, CMIT, Kumamoto University, Kumamoto 865-8555, Japan, ohta@cc.kumamoto-u.ac.jp

² Hiroshi Nakano, CMIT, Kumamoto University, Kumamoto 865-8555, Japan, nakano@cc.kumamoto-u.ac.jp

³ Kazuhisa Suzuki, General Affairs Section, General Affairs Division, Kyushu University, Fukuoka 812-8581, Japan, k-suzuki@jimu.kyushu-u.ac.jp

⁴ Tsuyoshi Kiyama, Graduate School of Science and Technology, Kumamoto University, Kumamoto 860-8555, Japan, kyan@coe.kumamoto-u.ac.jp

⁵ Yuriko Shimizu, CMIT, Kumamoto University, Kumamoto 865-8555, Japan, shimizu@cc.kumamoto-u.ac.jp

⁶ Chisato Noguchi, CMIT, Kumamoto University, Kumamoto 865-8555, Japan, noguchi@cc.kumamoto-u.ac.jp

⁷ Toshihiro Kita, CMIT, Kumamoto University, Kumamoto 865-8555, Japan, t-kita@cc.kumamoto-u.ac.jp

⁸ Hidenori Akiyama, Graduate School of Science and Technology, Kumamoto University, Kumamoto 865-8555, Japan, akiyama@eecs.kumamoto-u.ac.jp

At our University, WebCT has been used in the Basic Courses of Information Technologies and CALL since 2003, and all students, courses, and teachers have been registered by the cooperation of information of course registrations with Kumamoto University school affairs information system "SOSEKI".

Teachers and students can do all possible operations from Web browsers respectively by using WebCT. It is necessary to take the confirmation from the vender about the usage conditions for using it for open courses.

Fig. 1 shows the Web top page of e-Learning Station of the trial version. The pages of the total guidance, the course list and explanations of these contents, registration of courses, registration changes, inquiries and login were hyperlinked from the top page. Pages of the guidance, the introduction, and the explanation were described in HTML, and pages of registration of courses, registration changes, and inquiries were done by CGI. WebCT login page was hyperlinked as 'login'.



Fig. 1: Top page of e-Learning Station (trial version)

The explanation page was prepared as easy-to-read as possible so that the applicant to the courses should not hesitate at registration and content of courses. For instance, the page of guidances (Fig. 2) explained the flow until taking courses and hyperlinked to real operation pages in each step. In addition, it explained under that in detail according to items of "About wanting the monitor", "About registration", "About contents of courses", "About the system requirements", and "Inquiries".

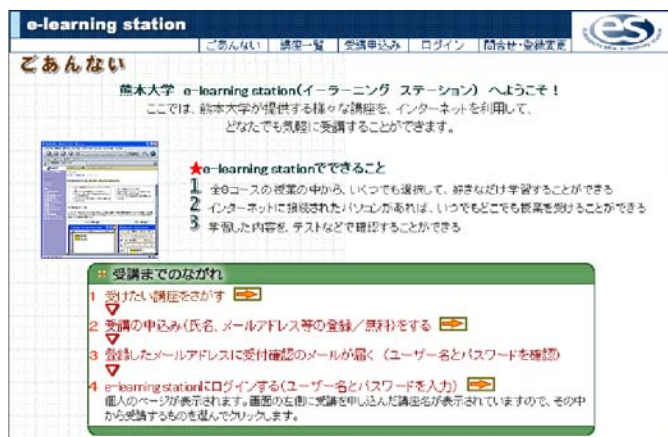


Fig. 2: The page of the guidance (trial version)

II. Contents

Outline and screen shot of each course was hyperlinked in the page of course list. Brief explanations of each course are as follows,

1. "Introduction to Personal Computer"
For beginners, explanation of basics of a personal computer and how to use Internet and e-mail.
2. "Office Applications"
The usage of a word-processing and a spreadsheet.
3. "Building a Web Page"
Building a Web Page including the basic, HTML, JavaScript, and how to upload a web.
4. "Introduction to Computer Science"
Basic knowledge of the Internet and basic architecture.
5. "Network Security"
Knowledge and measures on the security side for problems of computer virus and the computer crime.
6. "IT ethics"
The point that we like individual information and a copyright should note on internet-based is studied in detail.
7. "Introduction Course: Computer Structure"
The mechanism of a computer that is often treated as a black box is studied from the base.
8. "Introduction to Statistics"
Things from concepts of the mean value, standard deviation, decentralization, and the recurrence to the computational method is studied.

The first five contents originated from the material for courses of Kumamoto University such as "Basic Courses of Information Technologies A" and "Basic Courses of Information Technologies B" lecture. The rest three contents are authored by Data Pacific (Japan) LTD. as commercial contents.

When students input given user ID and password at the page of WebCT login, the list of the selected courses was displayed. When they click a course, the homepage on WebCT was displayed. In that,

- Explanation of course
- Teaching material contents

- Bulletin board
- Retrieval

were offered. Though a lot of tools were included in WebCT, we made it to necessary minimum, simple and comprehensible composition. A part of "Introduction to Computer Science" is shown in Fig. 3 as an example of the teaching material contents pages.

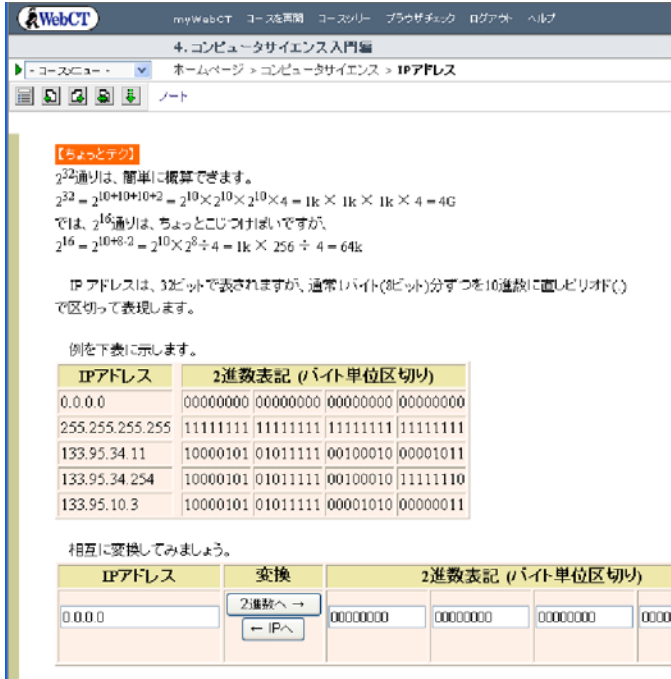


Fig. 3: The content of "Introduction to Computer Science" (trial version)

If necessary the contents of courses included questions that could be graded automatically and simulations using JavaScript shown in Fig. 3 so that student's learning effect is improved. For instance, when students use the part where this JavaScript was used any IP address can be seen at once in the binary number expression.

III. Questionnaire

The purpose of the trial content delivery is a thing to confirm a better making contents and the improvement of the offer environment for real operation. Therefore, student's reaction has an extremely important meaning. The questionnaire was executed for all registered monitors of 118 people. The execution condition of the questionnaire is shown in Table 1, and it introduces the results.

Fig. 4 shows the distribution of the ages and the occupation of students. The age group that dividing each other is the highest is 60-years old level. But the distribution was not so extreme to differ up to two times at most at more than 30-years old level. It was a result that there were a lot of 60-years old levels though it seemed that the age group had extended to the young generation compared with the citizen course with schooling. Most students were jobholders, and adopting a profession interesting results that homemaker's

ratio was greatly different on the boundary of around 60 years old.

Table 1: The execution condition of the questionnaire (trial version)

Trial content delivery period	March 1 - April 30 in 2004
Questionnaire execution period	April 24 - May 7 in 2004
Number of students	118
Number of respondents	97 (response rate 80%)
Collection method	The questionnaire was requested to students with mail, and it answered on Web.

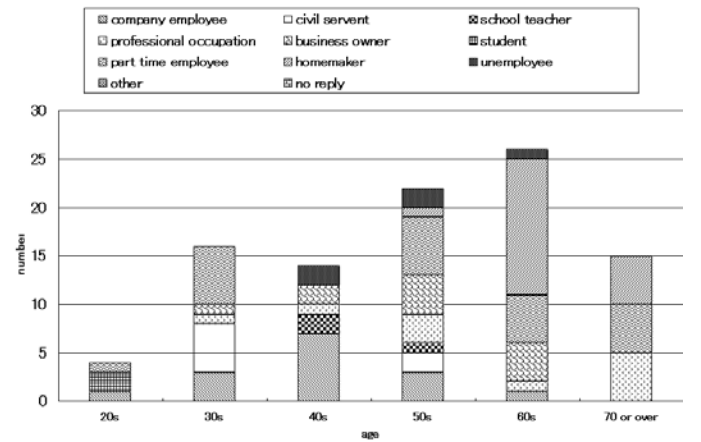


Fig. 4: The ages and the occupation of students

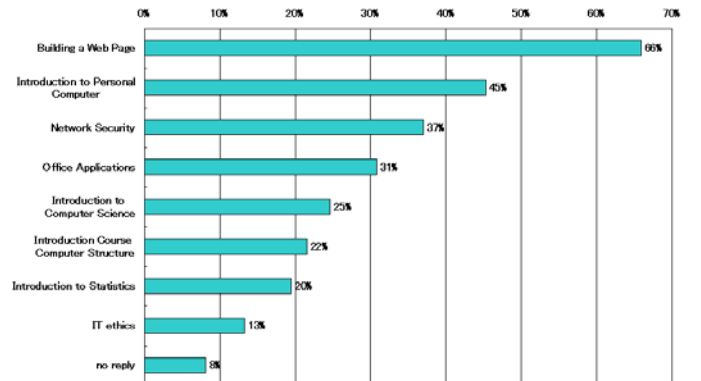


Fig. 5: The selected courses

A lot of students applied for two or more courses because they had assumed that two or more courses were able to be taken. The ratio is shown in Fig. 5 in a lot of order that is. There is a lot of "Building a Web Page", about 2/3 of the students, and the height of the concern is shown. However, there was reflection that the course name of "Building a Web Page" was not too good in the point from students by the free opinion column and mail, and the real delivery composed the name and the content again though it described later. The contents included building a Web Page by using HTML, CSS, and JavaScript, but no using an application for the homepage

creation. Therefore, there was a difference with the content that the student had thought about because the content was a little advanced occasionally.

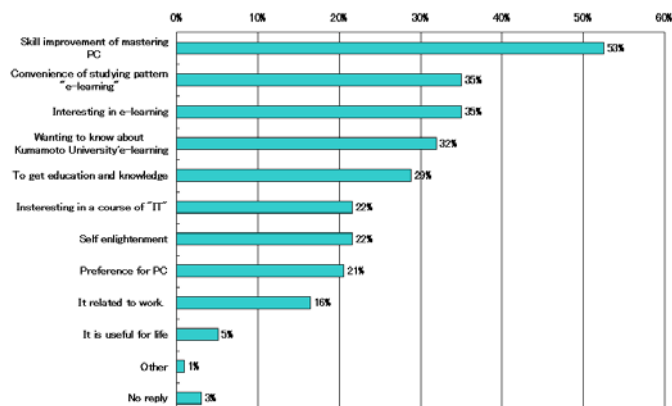


Fig. 6: The motivations of joining in "e-Learning station"

Fig. 6 shows the motivations of joining in "e-Learning station". A feature thing is there is an interest in e-Learning rather than contents.

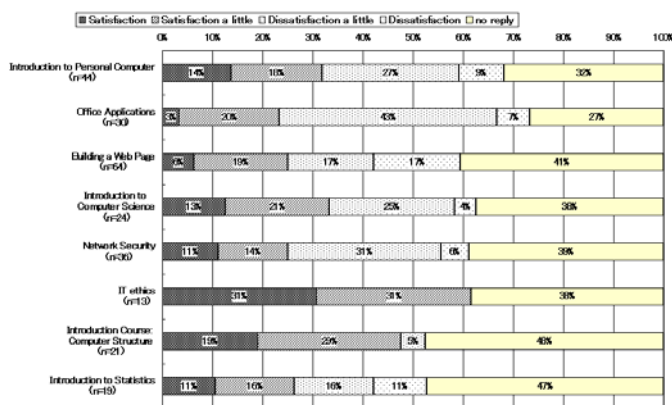


Fig. 7: The satisfaction rating of each course (N = number of respondents)

Fig. 7 shows the investigation result concerning the satisfaction rating of each course. The ratio of the student who answered as "Satisfaction" or "Satisfaction a little" has stayed in 50% or less in the majority of courses, though the population parameter is few.

The commercial contents "IT ethics" and "Introduction Course: Computer Structure" won popularity among all the contents. We strongly felt that our original contents must be revised to be much better in quality. The immaturity of correspondence to ascertainment of object and form of remote, asynchronous participations of lectures was felt strongly, though the first five courses were added great changes for the citizens based on courses to target the freshman in our University.

It introduces some points that seem to serve as a reference in the future from free aforementioned of the reason concerning the satisfaction rating.

We felt the necessity such as regular caring from us though "It was busy and did not take courses.", "Because taking courses is not compelled, it inadvertently cuts it." and "Because I depressed at once." were difficult points in an asynchronous, remote form. There is a necessity for enhancing contacts from teachers and communications using the bulletin board, too. It seems that a part of contents might be indicate regularly because they become scarce a time change though all contents were indicated from the beginning.

"The contents of 'Building a Web Page' cannot often be understood because it is familiar to build it using software on the market.", "The greater part of time was spent on 'Building a Web Page'.", "It was necessary to limit it to the course suitable for my needs.", "Because there was a difference of the skill by the course.", "I don't think that it sees the target of the course easily.", "The content is not general, and it is uncertain which level to make a target.", and "When the taught level was clear, it had the doubt." had the suggestion enough a prior explanation for each course, It is necessary to enhance information for the content, the contents, the schedule, the assumption knowledge, time, and suitable course names.

"When it was a class of interactive (correction and so on), it was better.", "There only had to be a check test.", "I think it is necessary for the instructional design by some devices.", "I want the entertainment.", and "There seemed to be a lot of outline content. It seemed that the interest increased when there was a concrete case study that faced in daily life." were shown that there were still a lot of points that contents should improve. The improvements of the introduction of check tests, the re-composition of contents based on instructional design, the screen design, and case studies were thought.

REAL MANAGEMENT

The e-Learning Station was managed for the period from September 28, 2004 to January 31, 2005. We reports on change and customizing of LMS and the improvement based on the result of the trial content delivery.

I. e-Learning System

The LMS used for the real management was altered from WebCT to Moodle [2][3]. Moodle is a LMS of open source based on GNU license begun by Martin Dougiamas of the Curtin Institute of Technology in Australia. A lot of languages are supported, and it has been enhanced considerably by the effort of users for making to Japanese. The main reasons to adopt Moodle are the level as LMS already that can be used enough, the limitation of the number of user registration shall not be basic, customizing of functions, and interfaces must be possible and providing the function to show contents without logging it in.

It went before real management was done in Kumamoto University open lecture "Internet server construction with Linux" with Moodle from August through September of 2004, and the possibility is verified beforehand.



Fig. 8: Top page of e-Learning Station

The Web top page of e-Learning station is shown in Fig. 8. Compared with the trial content delivery (Fig. 1), it changed to a comprehensible design. The button that stood out to reach a target page at once was arranged. Referring to the result of the questionnaire of the trial content delivery, It changed to suitable course names for contents if necessary again, and the explanations of each course were seen greatly. The case of "Introduction to Computer Science" is shown in Fig. 9 as an example. Object of taking courses, assumption knowledge, delivery frequency, first time and the final delivery day, outline of courses, how to advance studies, study time of standard, presence of test, correspondence to question, and capacity were specified for all courses. Without indicating all contents from the beginning, a part of contents was regularly indicated.

The automatic registration function of Moodle was not used, and managing user method was similar to the trial content delivery. Studying can begin by inputting the username and the password on the page of Moodle (Fig. 10) hyperlinked from "The user's login" of top page (Fig. 8). The function to customize the theme of Moodle was used, it made a change to the source code, and a screen considerably different from original Moodle was made easily to use (Fig. 10). The "TRY" button in Fig. 10 can inspect a part of contents without logging it in.



Fig. 9: The explanations of "Introduction to Computer Science"



Fig. 10: Moodle page of e-Learning station

II. Contents

Though only eight courses limited to the IT field were delivered in the trial, the following 17 courses of five fields were done in real management.

- Culture of Kumamoto
"Lantern festival of Yamaga City", "The stone talks - History inquiry of Midori Town".

- Education
"Mathematics talk", "Special support education - One step of start".
- Natural environment
"What Ariake Sea and Yatsushiro Sea request now",
"Dancer in tidal flat - Uca lactea".
- Promotion of High-School University Collaboration
"English study support"
- Information technology
"Introduction to Personal Computer", "Introduction to Word", "Introduction to Excel", "HTML course", "JavaScript course", "Introduction to Computer Science", "Network Security", "IT ethics"(100 capacity), "Introduction Course: Computer Structure"(100 capacity), "Let's make the personal computer for myself".

The first seven courses in the IT field were re-composed referring to result of the questionnaire based on the trial content delivery. Other contents are all new. The check test, animation, and the voice were increased to contents compared with the trial content delivery.

The number of registrants is 710, and the total number of taking courses is 2,513.

SUMMARY

We provided an e-Learning program for local citizens called as "e-Learning Station" supported by the Community Contribution Special Support Activities Budget. The e-Learning Station did trial content delivery that included 8 course of IT field during spring in 2004. The questionnaire was executed at end of the delivery, and the response rate was 80%. The e-Learning Station was managed with 17 courses of five fields for the period from September 28 in 2004 to January 31 in 2005. The LMS used for the real management was changed from WebCT to Moodle, and we restructured contents referring to the result of the questionnaire. The number of registrants is 710, and the total number of taking courses is 2,513.

REFERENCES

- [1] WebCT:
<http://www.webct.com/>
- [2] Dougiamas, M. and Taylor, P.C. (2003) Moodle: Using Learning Communities to Create an Open Source Course Management System, Proceedings of the EDMEDIA 2003 Conference, Honolulu, Hawaii (2003).
- [3] Moodle:
<http://moodle.org/>