Learning Management System 'MOMOTARO' for Cyber Campus

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Abstract: MOMOTARO is the Learning Management System(LMS) that Okayama University of Science originally developed, and MOMOTARO supports Kake Consortium Cyber Campus (KC3). e-Learning on the Internet is an important education method not only for distance education but also improving the education effect by face-to-face lecture done in actual classroom. A cyber campus is constructed by the technology of e-Learning. In many cyber campuses, the lectures are offered by one organization as an university or a high school. In the world, there are some LMS that can correspond for that case. In KC3, a lot of universities are offering the lectures. Moreover, students at a lot of universities and a lot of high schools attend the lectures of KC3. In that case, KC3 has some difficult problems to handling contents and records of learning by students. In order to solve these problems, we originally developed ' MOMOTARO'. We will report on a current state of KC3, and a design policy and effective functions of LMS 'MOMOTARO'.

1. INTRODUCTION

KC3 is organized with five universities and the credit transfer is done between five universities. Moreover, the credit can be recognize to the high school students by Okayama University of Science(OUS), and after entering OUS, the high school students can get the credit from OUS. Fig.1. is Construction of KC3. A coordinated educationn of OUS and high schools united with a coordinated education of five universities in Kake group,and KC3 was constructed in 2005 fiscal year. The Web system as Learning Management System(LMS) that manages the whole is needed to manage KC3 smoothly.
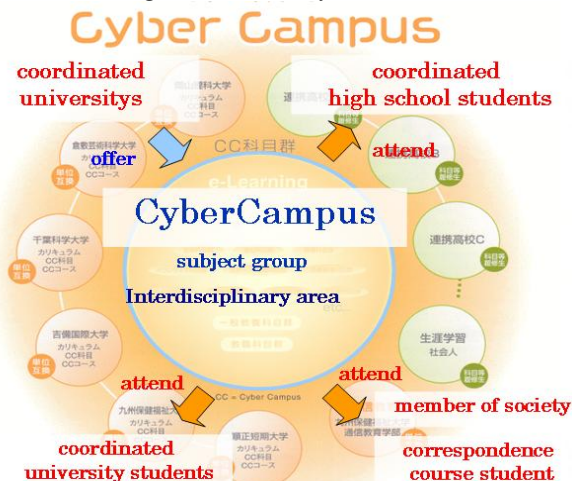

Fig.1. Construction of KC3

Fig.1 is the Construction of KC3. The distance learning between two or more independent organizations has points different from the distance learning in the same organization. Moreover, the distance education system is a developmental stage, so the LMS should be also flexible. The LMS was originally developed to meet these demands, and it was named "MOMOTARO". Five universities and twelve high schools (four schools outside Okayama prefecture, eight schools in the Okayama prefecture) are participating in a cyber campus in 2007 fiscal year. A coordinated education of OUS and high schools uses interactive live and interactive VOD. A coordinated education of five universities uses only interactive VOD. Fig.2. is Top web page of our cyber campus.

Fig.2. Top web page

2. LMS 'MOMOTARO'

We have been developing the LMS 'MOMOTARO' since 2004[1]. The LMS is developed to manage e-Learning. The MOMOTARO consists of the following function.

(1) Learner and Lecture management
(2) management and delivery of teaching material
(3) attendance management
(4) problem submitting
(5) communications function
(6) security management
(7) support of interactive live
(8) questionnaire total.

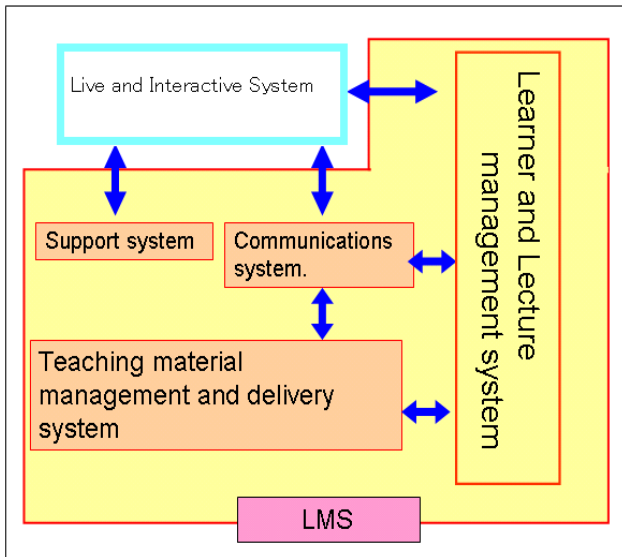Figure 3 is a composition of LMS 'MOMOTARO' and it is developed by PHP language and data base MySQL.

Fig.3 Composition of LMS 'MOMOTARO'

Overview of the System: The user can log it in from top page in the attestation of ID and the password. After it logs it in, it becomes a subject selection screen, and the content of the page displayed by the user authority of ID is different. Those who attend a lecture select the subject here and the page of the subject of attending a lecture is displayed. The manager can manage the entire Web system from the system management screen. The lecturer can manage the subject on the subject management screen on the page of the charge subject. It is one of the most important points that there are four level user authorities. The authority is for the manager, the lecturer, the teacher of the high school, and the learner. The authority for the teacher of the high school is a big feature of MOMOTARO. Because high school students are managed by the teacher at their high school, this authority is necessary as the management of the high school. A lot of LMS doesn't have this authority. Figure 4 is a screen where the study contents such as VOD are presented.

Fig.4 Web page of study contents

Management of Attendance: The form of the attendance card is made in MOMOTARO, and it is assumed that it attends by inputting to the attendance card and transmitting. The attendance card data can be in real time confirmed because it is registered in DB, and it is reflected in the attendance table automatically. Teachers of the high school can confirm attendance situations of the students of their high school. The lecturers can confirm the attendance situation of all learners of their charge subjects. Lecturer's attendance confirmation screen is Figure 5. The lecturer can confirm an attendance frequency, a situation of attending a lecture, a content of the attendance card and learner's individual information from this attendance confirmation screen.

A green part of Figure 5 means the lecturer confirmed the content of the attendance card. The lecturer can send mail by specifying the learner from this screen. The deadline for submission of the attendance card can be set, so the effect of the study promotion can be expected.

Fig.5 Web page for attendance confirmation

Subject Management:

(1)Submitting reports management

The lecturer can set participant's submitting thing of each time of the lecture. Learners who attend a lecture can confirm the demanded submitting thing of each time. There are an attendance card and a report in the submitting thing. Figure 6 is an input screen of the attendance card. Two or more questions that confirm the content of study to the attendance card can be added because of the prevention of the fictitious attendance.

Submitting the report adopts the form that transmits the file. In this method, it is on MOMOTARO, it is preserved in the server by specifying the submitted file, and transmitting, and it is managed with MOMOTARO.

(2) Subject information management

"Information" function that the lecturer informs those who attend a lecture of information on the subject is provided, and reports of each subject can be displayed in the subject top page. The lecturer and the system administrator can do

registration and the edit of information put on "Information" from the screen of the management of the subject of MOMOTARO. The syllabus of the subject can be inspected on the subject page, and registration and the edit can be done from the subject management screen.
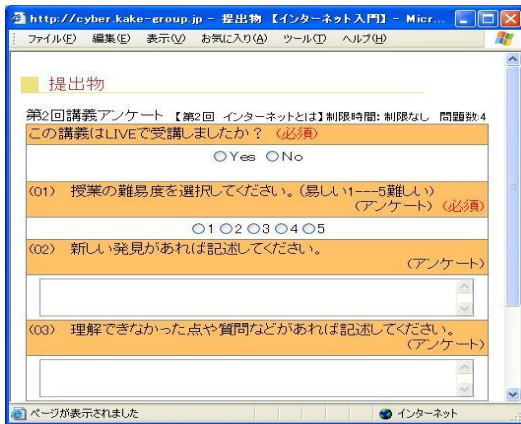

Fig. 6 Web page for the attendance card

Live Type Class Support: It is though is limited to a simultaneous connected number of clients by the number of licenses that has been contracted though CentraOne (Centra Co. and United States) is used in the live type class of interactive synchronization it. Therefore, it is difficult to confirm those who attend a lecture all individual's opinion all together. The support function to solve this problem was added to MOMOTARO. The question registration, the question presentations and the answer total displays are provided as this function. The lecturer is registering the question in MOMOTARO beforehand. The answer is a selection form. The question is presented while lecturing, and the participant answers. It is in real time totaled, and the graph is displayed to the answer result automatically. The lecturer can advance the class by confirming the result. It thinks this function for the effect of making the participant participate in the class, and making it sustain one's concentration to exist.

Software Composition of Server (MOMOTARO)
OS used with the server is RedHat Enterprise Linux. The Web server uses Apache. PHP of the script language with which MOMOTARO is constructed is operated by building the module into Apache. The data base uses MySQL.

3. ACTUAL ACTIVITY

Table 1~3 are the data in 2005~2007 fiscal year. It is a number of subjects and total number of enrollees of attending a lecture managed with MOMOTARO. The number of enrollee real person in 2007 fiscal year was 1475 people. The enrollment students at OUS were 832 people, and 17% of all students. There was no trouble to which the lecture stopped through one year. Authors feel that KC3 was established as a new educational style.

Table1. Number of subjects

Fiscal year	Number of subjects
2005	7
2006	26
2007	34

Table2.Total Number of enrollees

Fiscal year	Total Number of enrollees (University Students)	Total Number of enrollees (High School Students)
2005	735	118
2006	3079	73
2007	4436	93

Table3. Total enrollees (University + High School)

Fiscal year	Total enrollees University+ High School
2005	853
2006	3152
2007	5099

2006 and 2007 fiscal year is compared in 2005 and 2006 fiscal year, the number of subjects increases to eight subject about four times, and there is. 1947 people every four total of the total of the enrollee of attending a lecture number Yac times increased and 5000 people were exceeded. The number also of participants increases steadily as the number of subjects increases. The person with whom the attendance frequency of the numbers of enrollees of the credit transfer attending a lecture filled nine times of regulations doesn't do, and the result is by the subject with a big rose the person who became E judgment

As for the rate, the tendency to do registration of attending a lecture in high, easy feelings is seen compared with the interview class.

Table 4 is enrollee's of attending a lecture according to belonging in 2006 fiscal year and 2007 fiscal year real numbers (The communication life is excluded). The enrollee of attending a lecture real number in 2007 fiscal year increases more than 2006 fiscal year at all universities. OUS is using a cyber campus for student's about 17% and Kurasiki Univ. of Sci. and Arts by the student of about 14%, and thinks that they obtained citizenship in which an established feeling is a new educational form.

Difficult of Participant's personal identification: Enough measures are not necessarily made though MOMOTARO plans so-called "Identity theft attending a lecture" by combining various functions. As for the personal authentication technology, perfect prevention of "Identity theft" is extremely difficult from the feature of e-Learning though biometrics etc. have advanced. We think that the

paper test of face to face is the most excellent in cost-effectiveness when the credit is recognized, and the strict result evaluation. It is a situation that cannot help being thought by the wickedness theory though Internet world is not desirable. Enough security countermeasures that provide various attacks with LMS are demanded.

Table 4. Enrollee's of attending a lecture according to belonging real number in 2006 and 2007 fiscal year (Number of people)

	Okayama Univ. of Sci.	Kurasiki Univ. of Sci. and Arts	Chiba Institute of Sci.	Kibi International Univ.	Kyushu Univ. of Health and Welfare	High Schools	Total
2006	553	122	21	173	40	46	955
2007	832	231	58	222	54	73	1470
2007 Total students	4910	1600	1665	3720	2260	—	14155
Ratio of students %	17%	14%	3%	6%	2%	—	10%

4. CONCLUSION AND FUTURE PLAN

We illustrate LMS"MOMOTARO" which supports KC3. KC3 includes some organizations. By the use of LMS"MOMOTARO" each organization can manage the member of each organization. The function has important role to guarantee the quality of the distance education. The advantage is verified in actual activity.

The next approach of LMS"MOMOTARO" in the future is brought together as follows:

(1) "Identity theft" prevention function
(2) Automatic analysis function of access log
(3) Evaluation of learning results and controlling function
(4) Development of individual data backup function and viewer
(5) Coordinated function with cellular phone
(6) Security level up

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