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Tadauchi, Osamu

Inoue, Hitoshi

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On e-Learning: The WebCT System in the Teaching of Entomology [1), 2)]

Osamu TADAUCHI

Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, 812-8581 Japan

and

Hitoshi INOUE

Computing and Communications Center, Kyushu University, Fukuoka, 812-8581 Japan

Abstract. One of the e-Learning Systems, WebCT, was installed on a server at the Computing and Communications Center, Kyushu University in 2002. The system was utilized in the teaching of some subjects in the university and, in addition to conventional face-to-face teaching, lectures were given via the Internet. One of the initial subjects incorporated for use with the system was the Applied Entomology course of the Faculty of Agriculture. The WebCT courseware included information relating to syllabus, lecture schedules, course content, quizzes, reports, discussions, URL links related to applied entomology, a glossary, an image database and a questionnaire. Students could access the WebCT homepage of the subject they were enrolled in and to review their lessons and take examinations via the Internet. An outline of WebCT and its introduction to the teaching of applied entomology are presented and some noteworthy advantages of the system are discussed.

Key words: e-Learning, WebCT, entomology education, Internet, Kyushu University.

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Introduction

The Internet has had a great impact on the teaching and research of entomology. Internet tools help instructors and students to communicate and to easily find and access information (Zenger & Walker, 2002). Many universities have recently displayed their course descriptions and syllabi on their respective web sites. Many on-campus e-Learning systems such as BlackBoard, WebCT, CADDIE, IMS, JANZABAR and UnivASSIST, have already been developed and are currently available for use. One of these, WebCT, has many advantages and has predominantly been used in North America for higher education purposes (Saito *et. al.*, 2002). The Computing and Communications Center at Kyushu University, Japan acquired a license and installed WebCT on its server in 2002. One of the authors, Inoue, working as the main coordinator, began providing University-wide planning and support strategies for the use of WebCT as the official training course in our university. Another author, Tadauchi, responsible for the teaching of applied entomology, biological statistics, etc in the undergraduate course in the Faculty of Agriculture, made use of the WebCT system in the lecture program of the university from 2002. In the present report, an outline of the WebCT system and its introduction to the teaching of applied entomology at Kyushu University are presented.

On the WebCT system

Murray Goldberg of the Computer Science Department at the University of British Columbia, Canada developed the original WebCT system in 1995. The system readily enables instructors to apply innovative technologies to facilitate course preparation and enrich student's learning experiences. In 1997, together with his teaching assistant, he formed a company WebCT Educational Technologies, to continue the development of the course management system software and support its users. Following this, WebCT, Inc. was founded and has since provided the leading e-Learning solutions system for higher education.

Through the use of browser software as Netscape Communicator or Internet Explorer, the WebCT system allows one to create and save many elements quickly and efficiently. A course designer or instructor can construct a homepage on any subject by using "WebCT Builder". After a syllabus, including course and instructor information, is created, tools such as a course calendar, etc can be added. Students wishing to attend a lecture course must first register and be issued with a user ID and password. If a course designer has content stored on a local computer and wants to incorporate that content online, an upload tool in the system can be used for that purpose. The WebCT system

contains many tools such as annotations (for the taking of notes), assignments, audio, bookmark, calendar, CD-ROM, chat, compile, course map, discussions, glossary, goals, image database, index, language, links, mail, my grades, organize page, presentations, progress, quizzes, references, resume course, search, self test, student homepage, survey, student tips, URL links, video and a whiteboard. The "Manage Course" tool in the system is very useful in helping instructors, view and modify student records, presentation groups, teaching assistants and course functions.

Introduction of WebCT in the Teaching of Applied Entomology

The Applied Entomology course of Kyushu University begins in the second semester mainly for third-year students. In 2002 thirty-eight students belonging to the Faculties of Agriculture and Science attended the class. The lectures were usually presented face-to-face and employed the use of PowerPoint presentations. The WebCT course

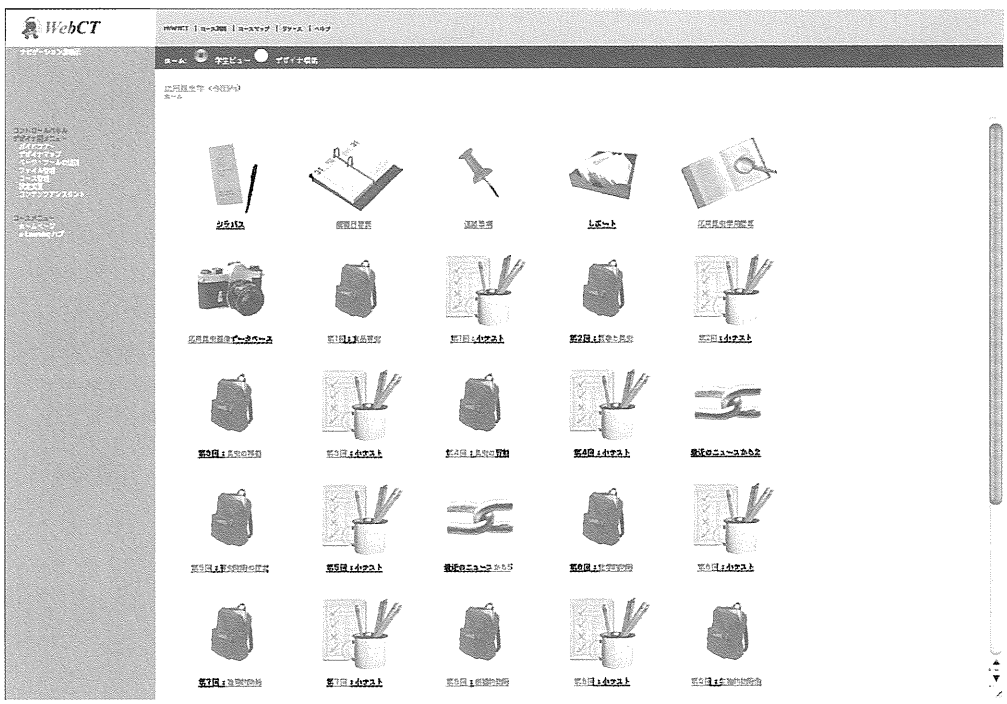
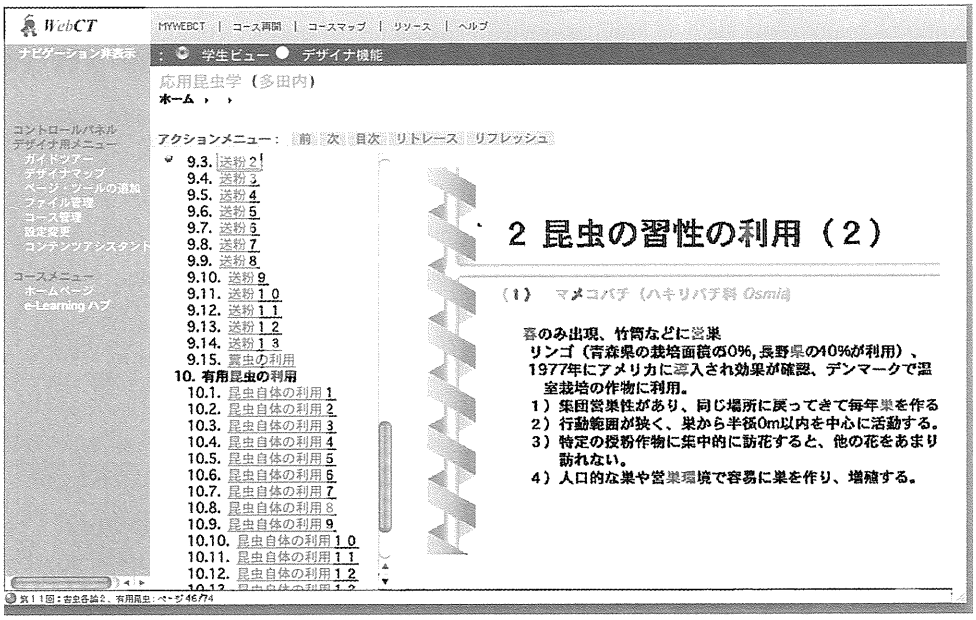


Fig. 1. Home page of the Applied Entomology WebCT course in the Faculty of Agriculture, Kyushu University.



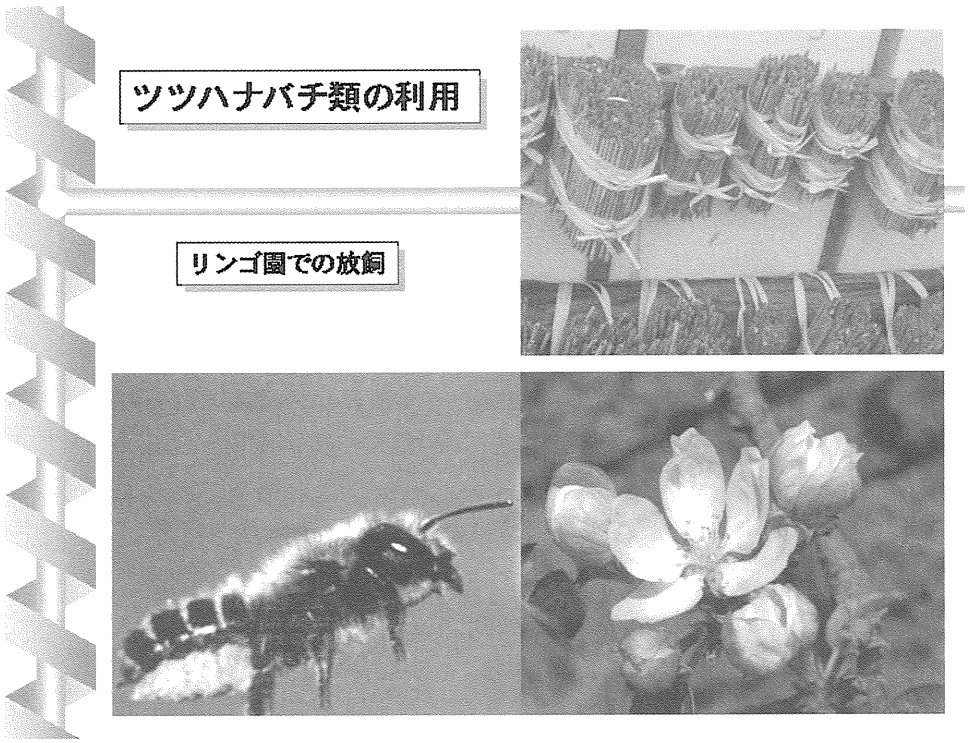


Fig. 2. An example of the lecture content, "Useful insects: use of pollinating insects, *Osmia*", in the Applied Entomology WebCT course.

Fig. 3. An example of a glossary in the Applied Entomology course. Students in the class can confirm their knowledge through the use of several tools including lecture content, glossary, image database, and a quiz via the Internet.

Fig. 4. An example of an image database, "Gregarious phase of locust: Outbreak in Magejima Is., Kagoshima Pref., Japan" in the Applied Entomology course.

site was password protected to limit access to enrolled students. Members of the class could access the course site, reconfirm their knowledge and take quizzes (small examinations) via the Internet. The applied entomology course in 2002 prepared a syllabus, lecture schedule, lecture content with references and useful URLs, reports, discussions (bulletin board), URL links to hot news, a glossary of applied entomology, an image database related to applied entomology such as pests, natural enemies, etc and a questionnaire. The home page of the Applied Entomology WebCT course of Kyushu University is presented in Fig. 1. Examples of the lecture content, glossary and image database in the course are shown in Figs. 2-4. A lecture content for each lecture contained 60 to 70 slides or pages on the average. A total of 804 slides were prepared for the Applied Entomology course in 2002. The course provides students with greater access to content and information, in addition to acting as a gateway to access additional information and resources such as other web sites related to the lecture topics. An interactive quiz was posted after every lecture which students could use for review purposes. In 2002, instructor used the discussion tool as a bulletin board to communicate with the students.

Students require a modified set of skills that will allow them to extract knowledge from the information avalanche enveloping them and to communicate through electronic media. (Zenger & Walker, 2002). WebCT has many advantages for instructors and students. A questionnaire concerning the use of WebCT in the teaching of Applied Entomology at Kyushu University was carried out via the Internet at the end of the lecture series. Responses were divided into five grades, 1: strongly disagree, 2: relatively disagree, 3: neither agree/nor disagree, 4: relatively agree and, 5: strongly agree. Some of the results obtained from the questionnaire were as follows:

1. WebCT is easy to use.
   Strongly agree: 21%, relatively agree: 50%, neither agree/nor disagree: 25%, relatively disagree: 4%.
2. Use of WebCT in the lecture course is acceptable.
   Strongly agree: 42%, relatively agree: 58%.
3. The WebCT resource is helpful in understanding classroom lectures.
   Strongly agree: 17%, relatively agree: 46%, neither agree/nor disagree: 33%.
4. WebCT resources reinforce your intellectual curiosity.
   Strongly agree: 4%, relatively agree: 50%, neither agree/nor disagree: 46%
5. The WebCT resources are often used after each lecture.
   Strongly agree: 21%, relatively agree: 54%, neither agree/nor disagree: 8%, relatively disagree: 17%.
6. The quiz (small examination) after every lecture is helpful for review purposes.
   Strongly agree: 71%, relatively agree: 29%.

The initial preparation of WebCT resources took a great deal of time. However, all students accepted (strongly agree and relatively agree) the use of the system as a complement to the lecture course. They also acknowledged the value of the quizzes offered after every lecture for review. We estimated that the delivery of lectures complemented by the WebCT system resulted in overall student satisfaction.

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