Technology Enhanced EFL Language Instruction at KUT

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Abstract: This article provides an overview of how technology has been incorporated into the English language curriculum at Kochi University of Technology. The physical layout of the CALL and LL labs, as well as the development of a comprehensive eLearning system provide insight on how a technology integrated learning environment can be initiated. The article explains the advantages of the current course management system in use, called Moodle, and illustrates a number of customized Moodle activity modules that have been developed within CORE Studies to motivate learners and to encourage interaction within the classroom. The latter part of the article focuses on mobile learning. A number of mobile apps that have been developed to supplement course textbooks and a unique mobile iPod lab are described. The article concludes with a discussion of the challenges faced with using technology in the classroom and future directions of mobile learning.

1. Overview & History

Over the past six years, a technology-enriched curriculum has helped to improve students' English learning outcomes and motivation at Kochi University of Technology CORE Center[1]. Since the founding of the university computer assisted language learning or CALL has been an integral part of the English language learning curriculum. In 1997, the university CALL lab was outfitted with 55 Macintosh computers and the LL lab was equipped with a Sony language learning solution. First-year students enrolled in an English computer literacy course taught in the CALL lab and used the LL lab primarily for English listening-based courses.

In 2005 and again in 2012, both the LL and CALL labs were upgraded with Windows notebook PCs. English course content was delivered via an eLearning platform called Moodle, a course management system or CMS used to organize and distribute course content and to facilitate communication between learners[2].

Currently the first-year curriculum, which includes a Science English and a Science Lab course, is extensively supported using an integrated set of web-based technologies that includes the Moodle CMS, custom designed web-based language applications and a classroom set of iPods. The web-based activities include extensive reading, writing, listening and speaking activities.

2. CALL development

2.1 Notebook computer lab

The language learning labs at Kochi University of Technology are designed specifically for language instruction, with face-to-face interaction playing a vital role in the curriculum design. The LL consists of 9 round tables, each equipped with 5 notebook PCs as shown in figure 1. The monitors on the

notebook computers can be closed when not in use to reduce distractions and enable greater opportunities for face-to-face interaction. Using a notebook PC lab layout, learners can also work together openly in pairs or small groups when completing class projects.

Figure 1: LL Lab layout

2.2 Mobile language lab

In addition to the two labs, portable iPod sets, shown in figure 2 and figure 3, are available for classroom use. Each set can hold 20 iPods and can be easily carried to any classroom to administer listening and reading activities. Each set includes a docking station allowing 20 iPods to be synched simultaneously and a Wi-Fi base router which is connected to the school network to create an ad hoc Wi-Fi network within the classroom. The Wi-Fi network enables learners to retrieve data from the course management system. Learners use the iPods to access multimedia and other language learning materials and activities residing on the server.

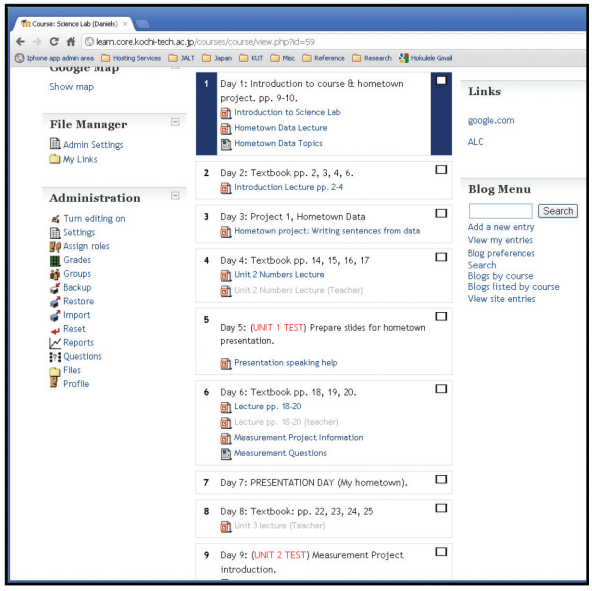

Figure 2: The iPod tray can be easily transported to any classroom

Figure 3: iPod trays are stored on a cart along with Wi-Fi routers to create a cost-effective mobile language lab in any classroom.

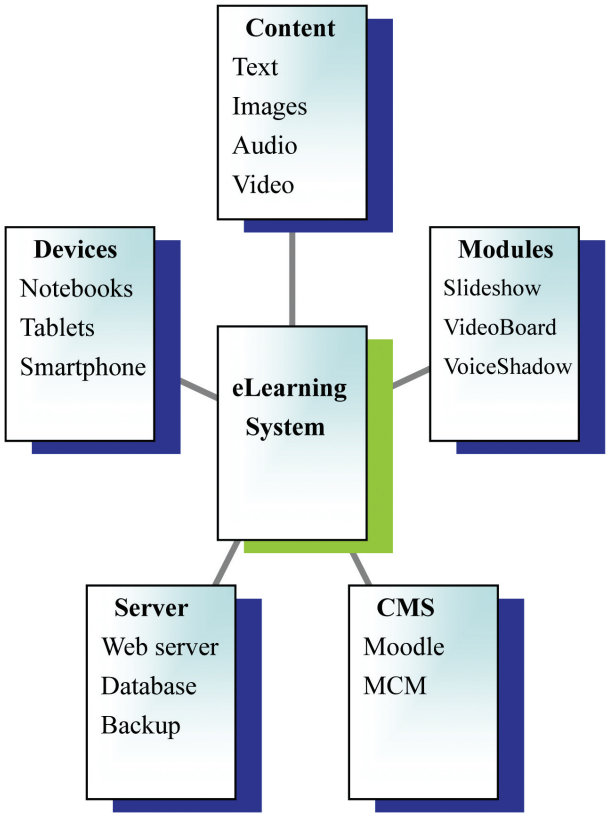

Figure 4: Elements of a comprehensive eLearning system

3. Online course development

3.1 eLearning System

The university's first web-based eLearning system, Moodle, was initiated in 2004. The Moodle CMS is principally administered and utilized by the CORE center, but any faculty member has access to create and administer courses within the CMS. The design of the eLearning system includes a number of aspects from content development to application development. The diagram in figure 4 illustrates the elements of CORE center's comprehensive eLearning system.

3.2 User management

CMS user management typically involves the time-consuming task of creating and maintaining learner accounts. Much of the overhead involved in CMS user account can be alleviated through the implementation of an institutional-wide database, such as an LDAP server, to maintain a distributed user directory. When the university's CMS was first initiated, usernames were created manually for each course and uploaded in bulk to the CMS. To simplify user management, the CMS was later configured to authenticate users against the university's LDAP server.

3.3 Moodle course management system

English courses at Kochi University of Technology are not 'online' courses per se; therefore the main objective of CMS implementation is to support the learning process both inside and outside of the classroom. Using a 'blended approach'[3], instructors are able to supplement typical classroom language instruction with multimedia content and interactive activities, while at the same time provide additional opportunities for communication and supplemental studies outside of the classroom. A typical course within the CMS includes an online course schedule with links to specific language practice content related to each lesson's topic. Course content might include audio or video files that accompany a textbook; PowerPoint slides to support a lecture, or multiple choice supplemental activities for self-study of specific vocabulary and grammar points. Figure 5 illustrates a sample online outline for a language course at the university. Learners can access the content both in class and outside of class.

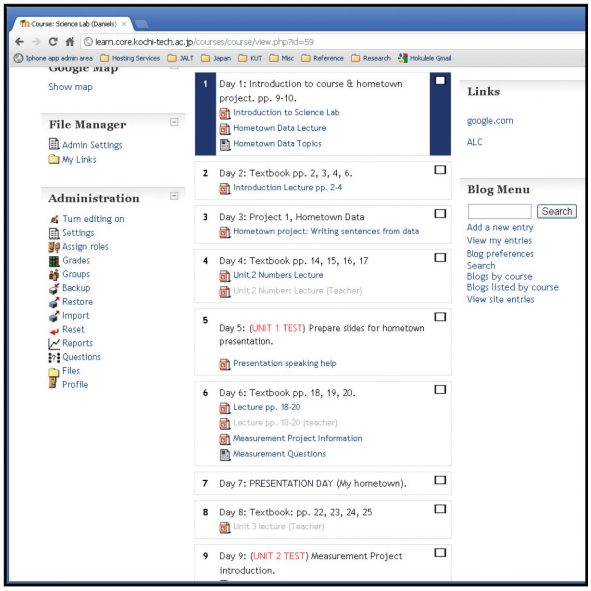

Figure 5: Sample course outline

4. Module development

4.1 Moodle modules

Moving beyond fundamental content delivery, the CMS is also widely used to support interactive project work. To better support the specific projects and activities within the university curriculum, a number of CMS modules were developed in-house. The activity modules are plug-ins to the CMS that provide additional functionality or allow the CMS to communicate with outside applications through an application programming interface or API. This section of the article provides an overview of CMS modules that have been developed at Kochi University of Technology and are actively being used to support the current English language learning curriculum.

4.2 Moodle Slideshow module

The slideshow module was developed to simplify the process of synching voice narrations with images in order to create an online slideshow. Figure 6 demonstrates the simple web-based user interface, which is used to select images from a computer and to record audio for each image or frame. A narrated slideshow, shown in figure 7, is automatically generated as an HTML5 package on the server-side. Images are resized and audio is synched with each slide using server-side scripts, thus maintaining a simple and clean user interface, an important element in a language learning environment.

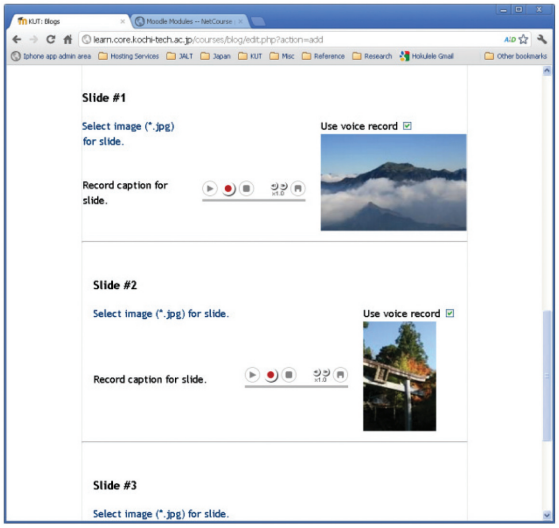

Figure 6: Adding images and audio to a slideshow

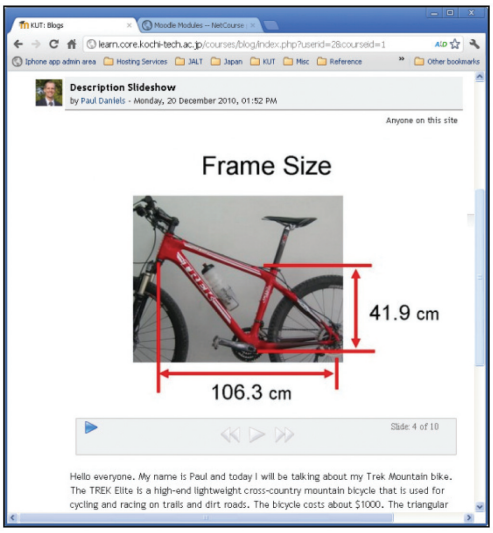

Figure 7: HTML5-packaged slideshow

Learners can also attach a set of multiple choice questions to their presentation and can post comments to other users' uploaded presentations.

The slideshow module is used extensively with students for presentation projects such as the hometown data project and the technical description project. This module can be used for presentation speaking practice or it can be used as a shared presentation 'board' or as a portfolio where uploaded presentations are shared within a particular course.

4.3 Moodle Google Maps module

The Google Maps module, shown in figure 8, makes use of the Google Maps API at http://code. google. com/apis/maps/index. html to closely integrate the Moodle course management system with Google Maps. The main advantage of this app is that the users do not need to create accounts or sign into Google to add locations to a course map. A single site or course account can be created with Google and used with any number of users within a Moodle course. Users simply login to the course management system and post to a course map, as shown in figure 9. The posts are stored locally and can be searched from within the course site.

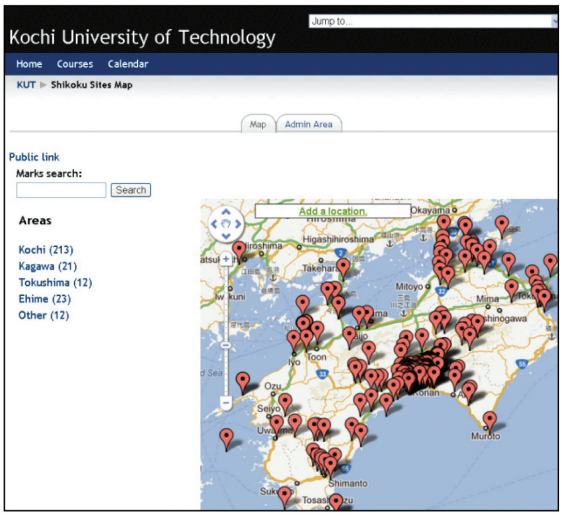

Figure 8: Google Maps Moodle module

Figure 9: User entry in Google Map Moodle module

The map data can be shared internally or it can be made public.

One example of how the map module can be used for language instruction is a travel guide. The travel guide content is generated entirely by the students at Kochi University of Technology in English and is intended to introduce sites of interest to foreigners visiting Shikoku. The project is an example of how learners can use English in an EFL setting for authentic purposes. The Shikoku travel project was implemented 2 years ago and currently contains nearly 300 entries describing Shikoku Island travel destinations, all written in English.

4.4 Moodle Mobile Blog module

The mobile blog module allows users to post images and text from their mobile device by sending their data to dedicated course email address. The original idea of the mobile blog was to bridge the gap between what students learn in the classroom and their out-of-class experiences. One activity in which learners participated was called 'The day in the life of a Kochi University of Technology student'. The immediate goal of the project was to document in English the daily lifestyles of Japanese university students. Projects such as this, carried out over a number of years, can serve as an authentic database of both culture and language. The entire collection is searchable by keyword and can be incorporated into a variety of lesson activities.

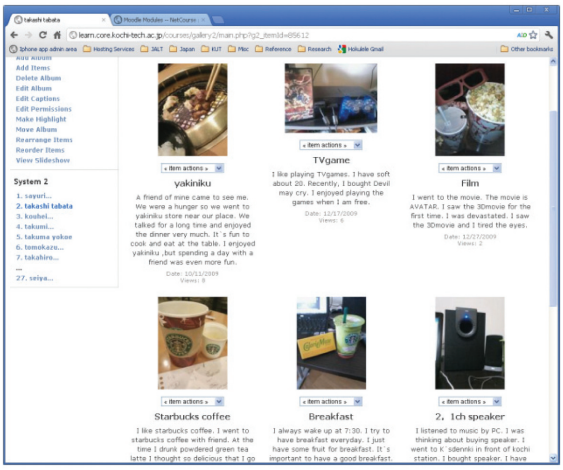

Figure 10: Mobile blog

4.5 Moodle VideoBoard module

The VideoBoard is a simple module that allows students to upload short audio or video clips to a shared page. The VideoBoard design encourages both self-evaluation and peer evaluation of speaking activities. Video can be recorded online using Adobe Flash, uploaded from a previously recorded clip, or captured on a mobile device and uploaded to the CMS directly. Video uploaded in different formats are automatically converted on the server to an MPEG4 format using FFmpeg.

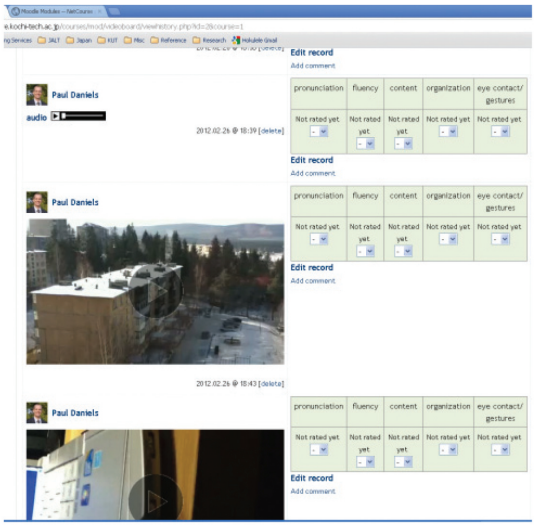

Figure 11: Moodle VideoBoard module

5. Mobile learning development

5.1 Mobile devices in education

As mobile devices are becoming more ubiquitous in educational environments, it has become increasingly important to ascertain to what extent mobile technology may be beneficial in educational institutions. One benefit of recent mobile devices is their ability to connect to wireless networks via Wi-Fi, thus allowing learners greater access to language practice both in and outside of the classroom.

5.2 MCM (Mobile Course Manager)

To allow learners greater access to language practice, educational institutions are faced with the challenge of integrating their current online course content with mobile formats. Since the current Moodle course management system in use at Kochi University of Technology lacked an interface for mobile device access, the decision was made to develop a mobile course manager from the ground up. The mobile course manager or MCM was developed as both a web app and a native mobile app. There are obvious benefits to both approaches. The web app keeps all content on a centralized database server and learning content is accessed online. Students and instructors must have access to a Wi-Fi connection to access the learning activities. Alternatively, the content can be accessed via a native mobile app. The mobile app shares the same content database that the mobile apps use, but with the native app, the content can be downloaded to the device allowing users to interact with the learning content offline.

MCM was designed to support multiple users, courses and activity types. MCM logs basic user and item analysis data to the server to aid in tracking learner progress. Currently there are four activity types, shown in figure 12, a vocabulary flash card activity, a vocabulary quiz activity, a multiple choice activity and a reading/listening activity.

Figure 12: MCM activity types

Content for each activity is created using a web-based manager. Text, images, audio and video content is inserted into templates for each activity type. An example of a multiple choice quiz activity and the template used to create the activity are illustrated in figure 13.

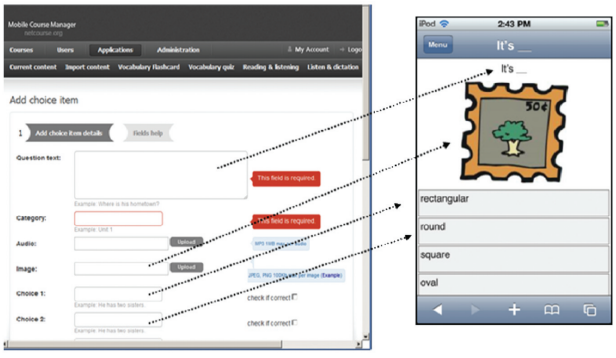

Figure 13: Web-based template for content creation

5.3 Mobile Slideshow App

An important component to language instruction is the ability to bring authentic and relevant content from outside into the classroom[4]. The mobile slideshow app shown in figure 14 was designed for this purpose. Using the mobile slideshow app, learners are able to capture images from outside the classroom to share with other classmates and to aid in authentic interaction using the target language.

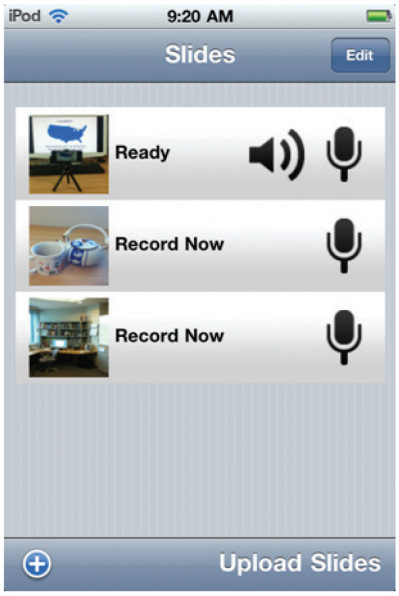

Figure 14: Mobile slideshow user interface

5.4 Mobile VideoBoard App

The VideoBoard mobile app was designed to support video upload from a mobile device to the VideoBoard module that was introduced in section 4.4. Using this app, video can be recorded directly from a mobile device and sent to a VideoBoard within any online course. The recorded video is automatically resized and compressed to a web-friendly format on the server.

5.5 Mobile VoiceShadow App

Voice shadowing is a language practice activity where a learner listens to a target language and attempts to repeat or 'shadow' the language[5]. The mobile VoiceShadow app allows learners to practice voice shadowing using a mobile device. Target language is uploaded by the instructor as an audio file to the Moodle CMS. Learners can then access the CMS to simultaneously listen to the audio file and record their own speech. The student-recorded speech is then uploaded to the CMS for teacher as well as self assessment of the target language.

6. Future Challenges

While Smartphones and other mobile devices, such as tablets, both offer new and exciting opportunities for language learning, there are still hurdles to overcome. Firstly, not all students have access to a mobile device, so when deploying learning applications, mobile devices may need to be made available to learners. Some institutions are either giving or loaning devices to students. Also, there are the difficulties involved in application development, and the inability to bypass online app stores to distribute applications within an educational institution. In addition, the Smartphone screens are still too small to deliver more sophisticated language learning applications. Lastly, mobile devices, such as the iPhone and iPad do not support Java or Adobe Flash, two widely used technologies for creating interactive web-based applications for learning. Ad hoc integration of mobile devices and course management systems will help spur more integrated and robust solutions to accessing online learning materials using a variety of devices.

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高知工科大学におけるテクノロジーを活用した英語教育

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要約：本稿では、高知工科大学におけるテクノロジーを活用した英語教育カリキュラムを概観する。CALL、LLの教室レイアウト及びeラーニング・システムの開発経緯を知ることは、テクノロジーを活用した学習方法の導入に資することができるであろう。次に、Moodleと呼ばれる学習マネジメント・システムの長所を説明したうえで、本学共通教育教室において独自に開発した、学習者の動機付けや教室内での対話を活性化させることのできるMoodleを使った活動モジュールについて詳説する。本稿の後半では、モバイル環境における学習に焦点をあてる。教科書を補充するための数々のモバイル・アプリ及びiPadを使った学習について説明する。最後に、教室においてテクノロジーを使用することに関する課題及びモバイル学習の今後の方向性について議論する。