E-Learning at Assumption University

Firouz B. Anaraki¹
and Myo Han Htun²
Graduate School of eLearning,
Assumption University, Thailand
¹fanaraki@au.edu
²myohanhtun@gmail.com

Abstract - The Graduate School of eLearning (GSeL) formerly known as College of Internet Distance Education (CIDE) was established in 2002 within Assumption University whose purpose is to provide Internet based eLearning programs to Thai and international students. In 2003, the main author was invited to work for CIDE as Director of Courseware Production Center. The main author proposed Moodle, an open source LMS as the main Learning Management platform for eLearning programs at the College. A courseware production team was formed by 2004 and the second author was the first member to work together as a team in production of online courses. The courseware production started in 2004 and has gone through some upgrades and major evolutions since then. This paper discusses the evolution of courseware production at CIDE and later at GSeL from 2004 till late 2014. This paper could provide some guidelines for any organization that wishes to establish online training or any academic institution that plans to offer online degree programs.

Keywords - E-Learning, Online Learning, Courseware Production, Learning Management System, Learning, Training

I. INTRODUCTION

Learning has probably become the most important activity in the current knowledge-based economy, which is characterized by industrial change, globalization, increased intensive competition, knowledge sharing, knowledge transfer, and the information technology. Globalization and life-long learning requires new methods of delivering education and training. It is estimated that education and training from pre-school to retirement constitute a US$2 trillion marketplace worldwide [1].

The College of Internet Distance Education (CIDE) was established in 2002 within Assumption University to offer online learning through the Internet. During early 2003, the executives of the College looked around searching for some commercial Learning Management Systems (LMS), the backbone software that enables the management and delivery of learning content and resources to student. Furthermore, a LMS could keep track of students and activities performed by students. Most LMS systems are web-based to facilitate “anytime, anywhere” access to learning content and administration. Few companies such as BlackBoard and WebCT were contacted to demonstrate their products to the executives of the College. Due to the high price and licensing of commercial LMS, the author proposed the use of the open source Moodle as the main platform for development of courseware. There are many good reasons to use the open source software, i.e. it’s free with no pop-up advertisement, full control of options and settings, access to source code, the right to edit the code, online support forum, and modification and derivation of other software from it. Moodle was opted since it was the most promising open source LMS due to its functionality, online forum, and the number of universities and colleges around the world using it. Moodle was developed using PHP script and MySQL database which are open source programming language and
database system and therefore could be run on any platform, i.e. Windows servers, Linux, and Macintosh computers under Apache which is also an open source web server.

After approval and adopting Moodle as the LMS platform for CIDE, the author proposed hiring of 4 key personnel to form the courseware production team. The 4 positions proposed were an instructional designer, a programmer, a web/graphic designer, and a video editor. These 4 key personnel were hired by 4th quarter of 2004. The web/graphic designer is a key member of the team from very beginning till today who is the second author for this paper. The main objective of the Courseware Production Team would be to design and develop online courses suitable for eLearning environment at the graduate and training levels. The contents will be added to the LMS software and this makes the LMS to become an LCMS. The Instructional Designer (ID) acts as the team leader who is responsible to constantly communicate with the Content Expert (CE) to understand the subject and its contents and to transform the material to electronic format suitable for eLearning mode. The ID at the same time seeks the expertise of other team members to accomplish the online preparation of the courses. Web programmer would be doing a very important task of understanding the coding and structure of the Moodle and to write programs to add new features and functionality to Moodle when needed. Web programmer, web designer, and the video auditor will also be closely working with the ID to design and develop online courseware.

II. SCIT* VERSION 1

Moodle was adopted as the Learning Management System (LMS). The courseware production team started adding features to it to satisfy the need of the College in online presentation of video lectures. This product was named “SCIT Plus” and its variant “SCIT++” in honor of the CEO of the College, Prof. Dr. Srisakdi Charmonman.

At the first step, the College executives decided to use SCIT* for preparation of the online courses for the MS in Information and Communication Technology (MS-ICT) program. Under the guidance and blessings of the CEO and CTO of the College, Program director of the School of IT and the director of Courseware Production Team adopted the video based approach for delivery of online courses. At the first trial, the Audio Visual department was requested to take a video camera to the classroom where the lecturer was teaching and recording the class lecture. Instructor was given a microphone to wear and the whole class lecture was recorded. This was during early 2005 when the eLearning mode was not recognized by the government of Thailand, and students were required to attend the classes in campus. After video lectures were taken, they were edited by the video editor member of courseware production team and with the cooperation of other team members, the video lecture was prepared in Windows Media Video (WMV) format and put on the College server, a Windows 2003 server with Apache, PHP, and MySQL (WAMP), and running the first version of SCIT*. The program to synchronize video lectures with PowerPoint slides was developed by the courseware production team and was called PowerV. This PowerV software was based on streaming technology which allows users to watch a video before a full download. Students registered for the courses could access the web-based SCIT* web-based software from anywhere and anytime to watch the video lectures using video streaming.

One major drawback of the first version was lack of clarity of video lectures as they were taken in a live classroom environment.

III. SCIT* VERSION 2

In order to improve the quality of the video lectures, a medium quality analog video camera was acquired. The lecturers were invited to a small office turned into a small studio for video recording. The program director of the MS-ICT program was the first
one to volunteer to record his subject ICT 5001, an ‘Introduction to Computers’ course at the studio. Few more ICT courses followed the same pattern. The quality of video lecture was greatly enhanced. The main drawback in the previous version was overcome. The PowerV software was also updated and new features were added to this software, i.e. students could pause at any time, rewind or forward through the video or jump to a specific topic in the lecture which was considered very important for use of these video lectures. But still there was a minor problem; the videos were in Windows media video format which meant only those using a computer under Windows could watch the video lectures. Fig 1 displays a PowerV video lecture. The screen is divided into 3 windows, the window on top right is the lecturer video lecturing a topic, the big window on left is the PowerPoint slides which are synchronized with the video lecture, and the small window at the bottom right is the command center. The student can pause, rewind, forward, or select a sub-topic among the topics available to watch or study that particular topic. Students could use this control panel at bottom right to select a subtopic within the main topic and jump to that subtopic as they wish. Other buttons such as ‘pause’, ‘play’, ‘rewind’, ‘forward’ are marked for easy access and moving fast through video lectures.

One major enhancement at this stage was providing the MP3 audio format of the video lectures available on SCIT+ LMS. Students really enjoyed this feature of SCIT+ as they could hear to the audio of the lectures on their mobile phones or other MP3 players anytime and anywhere. In a survey taken in 2006, students considered availability of the MP3 audio lectures as the second most important feature of SCIT+ after the video lectures.

IV. SCIT+ VERSION 3

By middle of 2006, the College of Internet Distance Education spent few million Baht to create its own Radio and TV studios. During this time, the courseware production team started utilizing these studios and taking the video of lectures at these highly well-equipped and the state of art studios. At the same time, a totally new version of PowerV was developed which works under Macromedia/Adobe Flash player. Flash player can be run on major platforms, i.e. Linux, Macintosh, and Windows based computers. This allowed the video lectures to be viewed under almost any personal computer. The Technology Division of the College of Internet Distance Education decided to call this new version of its software as PowerFx to be similar to FlashFx or Adobe Flash Player. There were many other enhancements in this version, i.e. students could choose to watch both lecturers windows and PowerPoint Windows or just view the PowerPoint Windows or change the size of the windows.

As seen in Fig. 2, PowerFx has a very similar displaying format as PowerV with 3 windows. Through Flash programming, the
video lecture is synced with PowerPoint slides, and student can jump or select any sub-topic in a lecture. This clearly shows that the students are in command when it comes to eLearning, the can learn at any time from anywhere and with any pace.

V. SCIT+ VERSION 4

The PowerFx became an important IT tool for playing video lectures as students just needed to download the free Adobe Flash player for their computer weather Windows based or Macintosh, or Linux boxes and watch the video lectures on the PC of their choice. During 2007 - 2010, SCIT+ went through some improvements. This is the period of stabilization and improvement in PowerFx technology. All these improvement were parts of the SCIT Plus version IV.

![Fig 3. PowerFX Video Presentation](image)

Some of the improvements in this version include converting the text of the PowerPoint slides provided by content experts to Flash or graphics in order to improve the quality of the slides on video lectures.

As shown in Fig. 3, the PowerFx went through enhancement, and the text and graphs were prepared in graphic format which made watching the video lectures much easier to eyes. The control panel was located at the bottom, and the selection of subtopics could be shown as pop-up by clicking the playlist button on bottom left.

VI. SCIT+ VERSION 4 OFFLINE

In 2010, CIDE had couple of students in Laos that could not watch the online lecture due to lack of bandwidth in their countries. To overcome this difficulty and to provide offline access to the courseware, an offline version of PowerFx was developed so that students could watch the courseware offline with all the capabilities of online version. The offline version of PowerFx with the courses that the student registered for were burnt on a DVD and the DVD was sent to the student for offline viewing and learning of the courses s/he registered for.

VII. SCIT+ VERSION 5

Since 2004, all the courseware developed could be viewed on a computer whether under Windows, Macintosh, or Linux operating systems which meant the students had to sit behind a computer to watch the whole video lecture. There were few surveys conducted among eLearning students that found listening to audio MP3 lectures on their mobile phones or MP3 players were very popular as it allowed students to listen to lecture at any time and any place when s/he demanded so. This researcher and his team decided to prepare video lectures in such a way that could be played both on computers of any kind and also popular mobile devices.

PowerFX could be played on any kind of PCs with Windows, Mac OS, or Linux based operating systems, but this is not a suitable choice for playing the video lectures on mobile devices for variety of reasons, i.e. Flash needs lots of resources which is all right when run on a PC but not necessarily on a mobile device with slower CPUs and memory. Besides, iPhone as one of the most popular mobile device cannot play Flash files directly. This researcher needed to reconsider development of the courseware from scratch so that the video lectures could play on both PCs and smart mobile phones.
In order to develop a video based lecture that could be played on both PCs and Mobile devices, this researcher decided to use MP4 videos rather than Flash videos. The procedure is shown in Fig. 4 below.

![Fig 4. MP4 Video Lecture Production](image)

As shown in this Figure, a digital camera is used to take the video lecture of the Content Expert while giving the lecture. A Digital Camera Control Unit (DCCU) allows for a completely digital video acquisition and full camera picture control. Also, a notebook is used that displays the PowerPoint slides prepared by the CE. A scan converter is used to capture the PowerPoint slides and convert it to MP4 format as video stream by changing the horizontal and vertical scan frequency of the video capture card on the notebook. The two outputs from DCCU and the scan converter is inputted to the video switcher (video mixer). With this device, it is possible to capture the input from one of the two devices, DCCU and the scan converter, or it is also possible to mix and combine the two outputs into one output. And that is what exactly this researcher did to produce a courseware in MP4 format. Four types of output were produced for PCs and various mobile devices. A resolution if 720x576 pixel is used for videos to be played on PCs, a resolution of 450x360 is used for iPhone, a resolution of 352x288 is used for Android phones, and a resolution of 176x140 is used for Blackberry and other phones with smaller screens. Most smart phones today can play the MP4 files. Using this technique, this researcher and his team developed produced the latest version of video based courseware.

Students now can use their PCs and/or watch them on their mobile device at anywhere when access to WiFi or 3G network is available. It is also possible to download the whole video lecture to a mobile phone and watch the lecture later at any time and any place where there is no WiFi or 3G network.

Fig. 5 below displays the look of the version V of the video lectures produced at Assumption University.

![Fig 5. MP4 Video Presentation](image)

As seen in this Figure, there is only one window, the lecturer and PowerPoint slides are all located on the same window as an MP4 file which can be played on almost any computer or mobile devices such as iPhone, iPad, Android devices, etc.

Assumption University has come a long way in developing and enhancing the eLearning. As smart mobile phones and tablet computers are becoming available almost to everyone and the Thai government initiative to provide a tablet to all Thai students, this system could be used in educating million of students all over Thailand.

**VIII. SCIT’ VERSION 6**

The emergence of smart phone and tablet technology with various kinds of screen sizes and their multimedia capabilities and internet browsing changed the nature of surfing the
Internet for the past few years. More people are spending more time on smart phones, tablets, and phablets (phone + tablet) than on their personal computers nowadays. But there was an issue of browsing the websites and contents in smaller mobile screens. Screens are much smaller even though their resolutions are higher but the contents on smart phones/tablets are too small to read for users. To overcome the difficulties or uncomfortable user experience for surfing the websites, many websites started to use Responsive Web Design (RWD) technique.

Responsive Web Design (RWD) is a new trend of web design approach aiming to craft the layout of the sites to provide an optimal viewing experience, easy reading and navigation with a minimum of resizing, panning, and scrolling across a wide range of devices from mobile phones to desktop computer monitors [2].

In 2013, GSeL decided to redesign all its websites and Moodle SCIT Plus software based on RWD in order all users could access the websites and students could access their courses and video lectures using any mobile device or PC, a truly ubiquitous system. Currently the SCIT Plus is based on Moodle 2.7.

GSeL students today can access their course from any smart mobile phone, or tablets, or PC under any operating system and watch the video lectures on their mobile devices from anywhere using 3G or WiFi networks on the move.

IX. CONCLUSION

Since its inception CIDE and currently GSeL at Assumption University has been using the latest technology in Information and Communication Technology (ICT) to design and develop the best possible websites and Learning Management Systems (LMS) to provide a variety of support to the students of eLearning using their PCs under various operating systems and these days to provide the same support to their mobile and tablet devices. Assumption University has gone a long way and has gained much experience in eLearning and the development will follow in future based on new technologies coming to market.

REFERENCES

(Arranged in the order of citation in the same fashion as the case of Footnotes.)