

Using Multimedia Learning System for Teaching Media Math

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Abstract: In this paper, we will focus on Multimedia University's own system known as Multimedia Learning System (MMLS). It is a web-based teaching and learning tool, supported by multimedia tools, which create a virtual interactive teaching and learning environment. Architecturally, MMLS comprises three sub systems, of the front end system for the user to interact, the main engine, which manage the content and interactivity and lastly the back end systems, which stores all data and history of the users. This study will look into the interface of MMLS for teaching Media Math in Faculty of Creative Multimedia (FCM) at Multimedia University. It also will identify the lecturer's preference in approaching the MMLS environment and it will comprise basic essential features of a successful web-based teaching and learning tool.

1. Introduction

Constructivist learning, with roots in cognitive constructivism [1] and social constructivism [2], is becoming the learning perspective that is being incorporated into the classroom to enhance student learning and focuses on knowledge construction and not knowledge absorption. This is even more significant with the introduction of technology, where this new breed of media-savvy students [3] are encouraged to learn with the computers and not from the computers, and multimedia and the World Wide Web (WWW) tools are readily available for them to access, develop, communicate and create a learning community not bound by time and space[4].

The use of the term E-learning is growing rapidly. It also frequently being used interchangeably with terms such as online learning, virtual learning, distributed learning, web-based learning and also distance learning. Despite their unique attributes, each of these terms fundamentally refers to educational processes that utilise ICT to mediate asynchronous as well as synchronous learning and teaching activities. It appears that from the first phase of analysis is that integration of the electronic media with traditional classroom is a useful teaching strategy, but should not be used on its own. Many educators still expressed a strong need for face-to-face interaction and lack of using electronic media to support their teaching.

Technology is one of the factors that can be effectively used to adapt a technological innovation in an organization [5]. According to Rogers, technology has two components: hardware and software. Hardware is the part of technology that includes the physical components, while software is the part

that consists of the information aspects that help to use it to perform certain tasks. He also mentions that a technology may only involve software and not any hardware, at all, citing examples such as a political philosophy, a religious idea, and a new event. Consequently, it is important for universities to understand the problems associated with the transition from traditional to virtual and take into account of such difficulties when making fundamental changes to the structure of universities.

2. The Overall of Multimedia Learning System (MMLS)

Underlying the concept of “a virtual teacher within a virtual classroom”, Multimedia Learning System (MMLS) was developed to address to the needs of the entire educational enterprise [6]. It is an intelligent management system, which serves as a platform for the delivery of multimedia rich contents to its learners. Within the technological framework, MMLS¹ (<http://mmls.cyber.mmu.edu.my>) is designed as an intelligent, interactive, self-paced, instructor-led, web-based teaching and learning tools. To its user friendliness, it is platform and database independence, auto-administration, intelligent learner tracking, instructor-led course management and fully web based. It is a web-based teaching and learning tool, supported by multimedia tools, which create a virtual interactive teaching and learning environment.

Architecturally, MMLS comprises three sub systems, of the front end system for the user to interact, the main engine, which manage the content and interactivity and lastly the back end systems, which stores all data and history of the users. MMLS is developed for end-users to assess and monitor their achievements in respect of their performance in such courses. Below are the characteristics of MMLS

- Interoperable - MMLS is interoperable so as to run content or learning objects from other LMS in to its environment and vice versa. MMLS is OS and DB platform independent.
- Scalability - MMLS is scalable to support large-scale systems and exchange of information between them
- Privacy and Data Protection - MMLS implements privacy and data protection policies and insure the integrity of data. Maintain the privacy of learner information Protect information from inappropriate access Ensure the integrity of information
- Flexibility and External references - Learner information includes many constructs such as learning objectives and learning history, which are in practice represented by different structures in different contexts. Learner information data models should be flexible enough to accommodate this need.
- Developed using Open Source Technology - MMLS is developed fully using Open Source. The use of Open Source Technology eliminates licensing issues. No third party licensing or tools are required.
- Various delivery modes - Online, Instructor-led, , Self-paced, Synchronous and Asynchronous
- SCORM Conformance - MMLS conforms to international standard, SCORM (Shareable Content Objects Reference Models).

Meanwhile, the following should be features facilitated by MMLS to an authorized learner or student:

- Tracking of individual Learners access to every learning object.
- Tracking of individual learner's progress recording of test scores (presented in table and

chart format)

- LMS authored assessments (Quiz)
- Scheduling of learning and personal events via the integrated calendar function
- Maintenance and management of users personal details
- E-mail, Chat, SMS , Discussion board
- On-line forum by course for asynchronous interactions
- Lecturer Notes, References, e-Library
- Packaged and Custom Reports
- Helpdesk
- User Manual
- Content Management facilities by instructors

At MMU, e-learning is widely used for the distance education as well as for the in-campus learning. All learning materials are made available via the MMLS, which is a Learning Management System (LMS). In-campus students are expected spend 80% using the face-to-face mode while the remaining 20% using the e-learning mode. These percentages are only a guide and it may vary from subject to subject.

3. The Interface of Multimedia Learning System

3.1 Managing and maintaining of users personal details

In getting started into the system, each lecturer is assigned with own valid Login ID and password to login into the system. It will lead the user to the Lecturer Main Page, as shown below in Figure 3.1, where the lecturer can view his or her profile and does the maintenance at any point of time as required, for examples, upload a photo, change password and customize the features on this page and even change the colour theme.

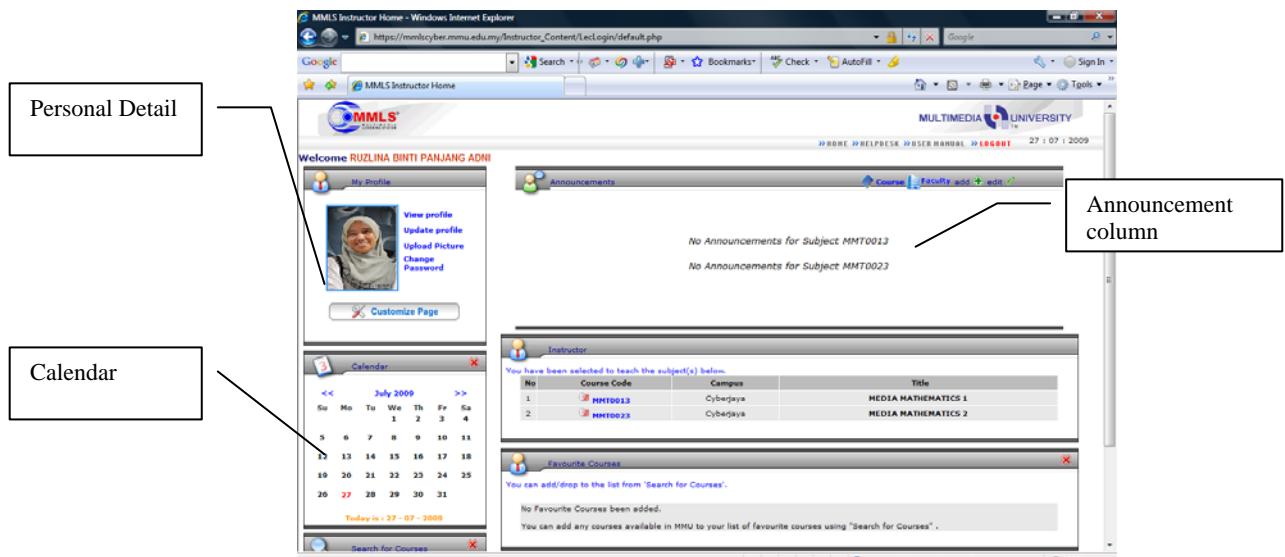


Figure 3.1 Lecturer Main Page

The lecturers can also use the calendar section to view the typical calendar or use it for viewing, adding, editing and deleting either for personal events or course events. The title of the events will be shown as well as the event type, such as, assignment, test, exam, tutorial, appointment and others and to whom it is assigned to. Only students who registered under the specific course can view the dates and events that have been posted by the lecturers. Any amendment or modification on the information can be done easily by clicking the “add” or “edit” button on the page. Apart from that, if the lecturers are in favour with any of the course offered at the university and not their teaching course, they can also search and add specific course by requesting it from the particular course’s coordinator. This feature affords the opportunities for the academicians to share the knowledge and information among themselves in a paperless concept at the university.

The other important features that is also provided here is to make announcements to the students. This is the ideal place to highlight any time-sensitive material such as assignment datelines, changes in syllabus, and changes in time and venues of the lectures, exam schedules and correction or amendments of the learning materials. The dissemination of info will be more effective and efficient with the introduction of this technology in the learning system. The crucial section in this Lecturer Main Page is to view and manage the courses that are assigned to the respective lecturers in that semester. From here, it will lead to the Course Content page, Figure 3.2.

List of Menu to be organized or maintained by the lecturer. This frameset will give the idea to manipulate the course in that semester.

The details of the particular course and places for lecturer to add, edit, modify, etc.

Type	Day	Time	Venue	Delete	Edit
Lecture	Thursday	9 AM to 12 PM	MC003 -- BR1021	X	
Lecture	Tuesday	9 AM to 12 PM	MC001 -- BR1022	X	
Lecture	Wednesday	9 AM to 12 PM	MC002 -- BR1021	X	

Figure 3.2 Course Content Page

3.2 Uploading Course Materials

In this Course Content page, one can view, add or modify all the course contents by using the course content menu which is located in the left side of the page. The course content menu is arranged in a nested folders that will link to materials and tools that are very helpful and useful to users, the lecturer and the students, during the face-to-face sessions or online learning environment. Menu such as Course Profile, Lecture Notes, Tutorials, Course Syllabus and Assignments are the most used components in this multimedia learning tool. To establish the course profile, one can add, edit or delete his or her contact details, the given time table and specific consultations hours. The process involves is very simple and easy-to-follow. To enrich the students needs in learning mathematics and to have better understanding of the said course, the lecture notes, tutorials and

assignments which can be typed in word document (*.doc, *.rtf or *.pdf) or can even uploaded the PowerPoint presentation (*.ppt) into the system as to enable the students to download them as required. As such, the lecturer can always ask the students to review and print the course contents before attending any lectures and at the same time, it can be shown in the form of slides in the classroom as teaching materials. With these features, it can create the lecturer confidence and capability to create engaging classroom environment for the students in learning mathematics. Less time will be spent on writing the mathematical theorems or definitions on the whiteboard since these can be viewed instantaneously in the MMLS. In addition, most of the lecture hours can be spent on showing the necessary workings or steps that involve in the mathematics problem solving and also, the lecturer can have more interactions with the students.

By using the Upload Course feature, all necessary contents for the course can be uploaded into this MMLS. This feature which contains a series of nested subfolders can be found by clicking the appropriate folder in the navigation path. In this paper, the lecturer is responsible to teach two Mathematics Courses which are Media Mathematics 1 (MMT0013) and Media Mathematics 2 (MMT0023) to the foundation students in the Faculty of Creative Multimedia. The templates that are used in this paper are only for MMT0013 Courses. In this course, the lecturer has categorized the courses into Algebra and Calculus. By doing this, the learning materials will look more organized and be an easy access to the students.

Figure 3.3 shows the uploaded Series of Lecture Notes in pdf file. In early stage, it is required to add the title of the new lesson and followed by entering all the slide titles and uploading the course learning materials files. If there is any change in the module learning, the lessons can be deleted. It can also be changed into slide and used as the material learning tools in the class. Each classroom at the university which is equipped with the multimedia tools such as over head projector, computer and scrolled screen can enable the lecturer to show the lessons during the class.

1 : Algebra			
Slide Name	Seq.	Delete	Check & add links
Chapter_1	1	<input checked="" type="checkbox"/>	Chapter1.pdf
Chapter_2	2	<input checked="" type="checkbox"/>	Chapter2.pdf
Chapter_3	3	<input checked="" type="checkbox"/>	Chapter3.pdf
Chapter_4	4	<input checked="" type="checkbox"/>	Chapter4.pdf

2 : Calculus			
Slide Name	Seq.	Delete	Check & add links
Chapter_5	1	<input checked="" type="checkbox"/>	Chapters.pdf
Chapter_6	2	<input checked="" type="checkbox"/>	Chapter6.pdf
Chapter_7	3	<input checked="" type="checkbox"/>	Chapter7.pdf
Chapter_8	4	<input checked="" type="checkbox"/>	Chapter8.pdf
Chapter_9	5	<input checked="" type="checkbox"/>	Chapter9.pdf

List of uploaded Lecture Notes for each module.

Figure 3.3 Upload Lecture Notes site

With the same approach and steps involved, by clicking the Tutorials subfolders in the same Upload Course menu, the entire tutorials plus their solutions can also be uploaded. If the lecturer allows the students to download the materials, it can be done by ticking the Downloadable column.

Also, the tutorials can be marked as general tutorial or group tutorial. In this section, the lecturer has created four different functions of folders namely Algebra – Tutorials and Solutions and Calculus – Tutorials and Solutions and marked them as general tutorial. In this way, the students will spend less time to search for the required learning materials. With this approach, learning mathematics can be more fun and enjoyable as students nowadays would love to see or learn things through technology rather than using the thick text book.

Similar to the lecture notes, all these tutorials and solutions can be edited, deleted and changed into slide info by the course coordinator. Once again, with the help of this online educational technology, students can be reached at any time and place with the reliable learning materials and hopefully, can boost up the students interest in learning mathematics via multimedia learning system. Another important features that is also available in the Upload Course folder, is the Model Questions folder. Here, the lecturer can upload several sample questions as preparing the students with the format of the questions given during the quiz, mid semester examination and final examination. The entire editing, deleting and even adding new question folder can be done by clicking the respective button on the screen, Figure 3.4.

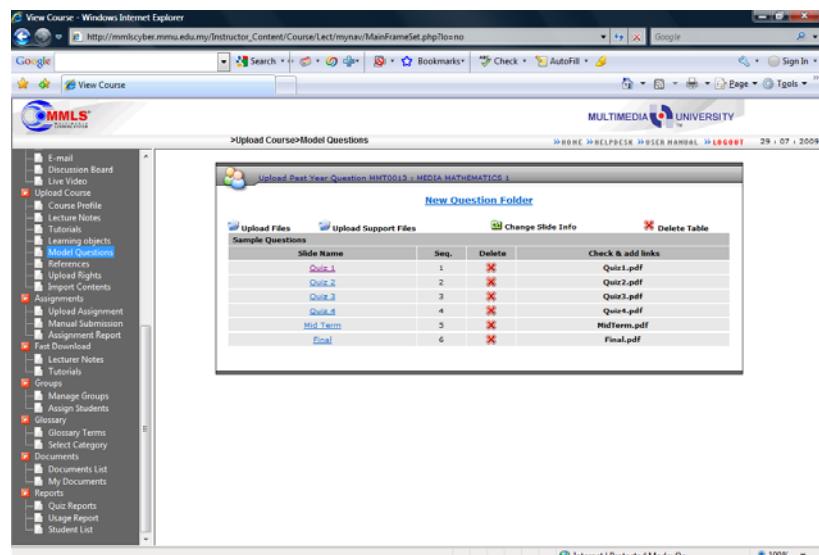


Figure 3.4 Upload Model Questions

The last feature that will benefit to the students from this Upload Course is the References site. In this site, Figure 3.5, any learning materials that will help the students in their courses can be added such as the URL description, details description of the books as well as journals. This will help the students to have more knowledge on the courses as well as have better understanding on the application of learning mathematics in real world problems. Since the students in this Faculty of Creative Multimedia will only learn all the basics mathematics in the courses excluding the applications, thus, this site has become a very important platform for the lecturer to upload any articles or journals that can relate the learning of mathematics with their interests in the art and design.

In general, the Upload Course folder plays the most crucial feature in this MMLS. Once the uploading learning materials is complete, the students and the lecturers can view them in a nested folder from the View Course menu in the left side of the site page. As seen in Figure 3.6, the

registered student in Media Mathematics 1 during that semester, can gain access to Course Info, Course Outline, Lecture Notes – categorized into Algebra and Calculus sections, Tutorials – categorized into the tutorials and solutions for each Algebra and Calculus sections and Sample questions in their own time and place.

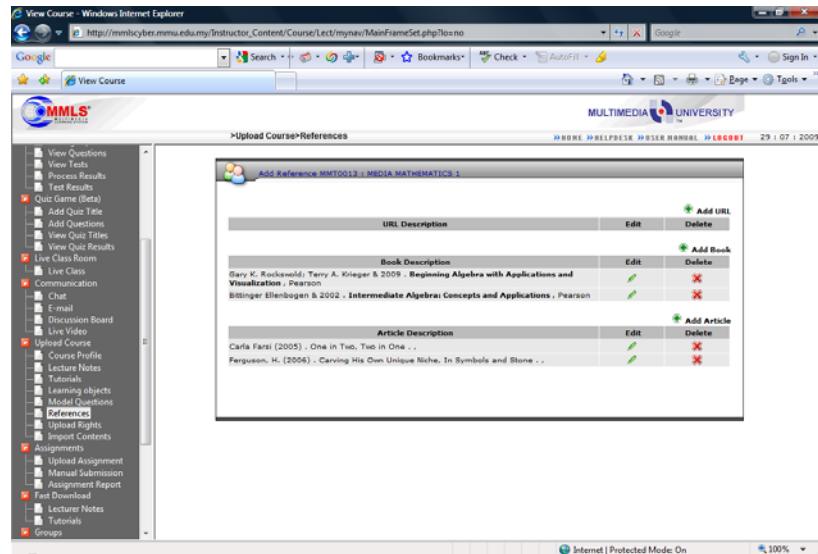


Figure 3.5 Add References Site

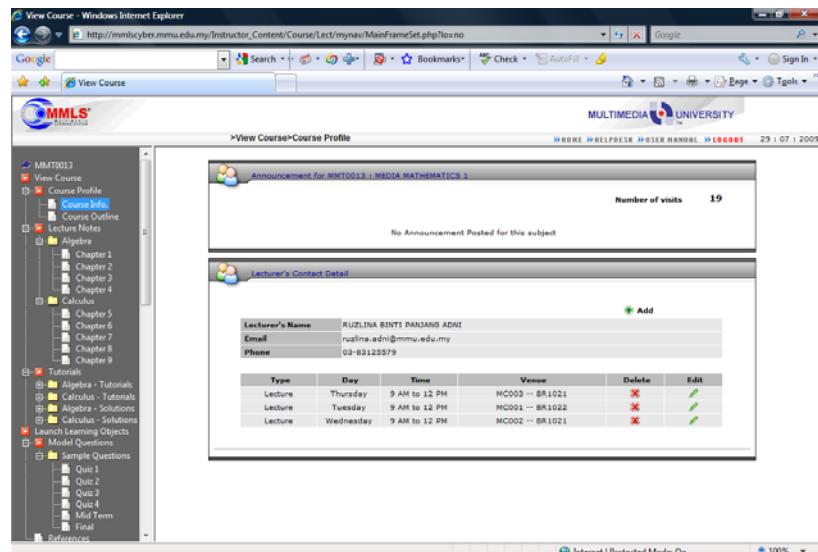


Figure 3.6 View Course Site

3.3 Restoring the Previous Course Materials

To create more effective and efficient way in using this MMLS, the lecturer do not have to repeat the same steps in every new semester. This can be done easily by restoring the previous Course Contents under the Import Contents menu from the Upload Course folder. One has to key in the academic year, semester and the course code and specific course contents that are required to be uploaded into the system, Figure 3.7.

There are other features that have been placed in the MMLS such as Quiz Centre, Communication, Groups, Reports and others. The features discussed in this paper are the one which is used more and frequently by the lecturer in teaching the students.

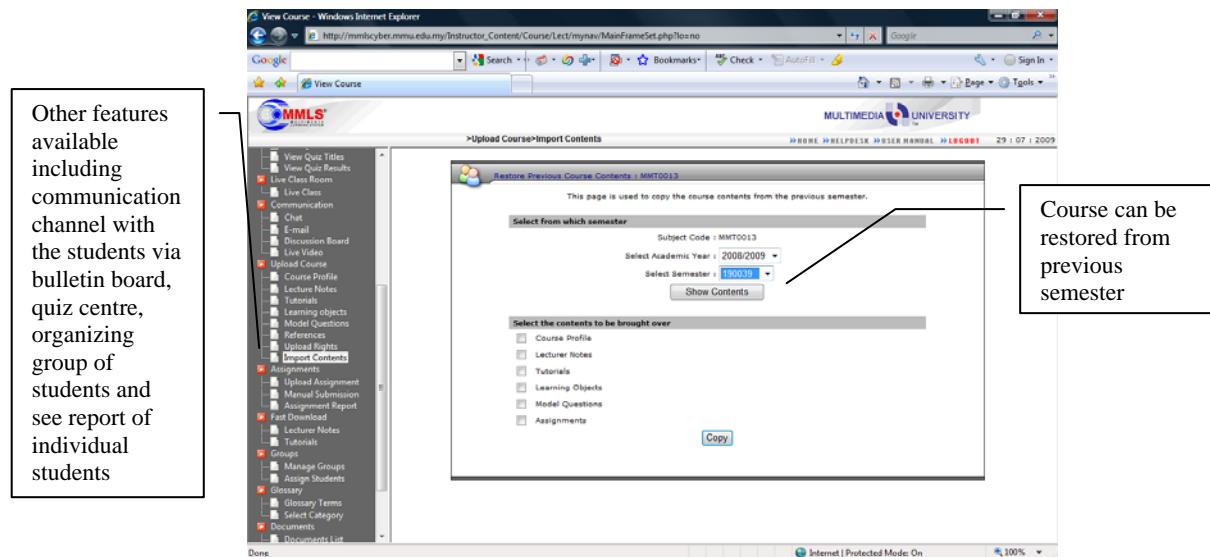


Figure 3.7 Import Course Site

4. Conclusion

Increasingly universities must provide quality and flexibility to meet the diverse needs of students – this will inevitably involve tailoring courses to suit differing educational needs and aspirations. Lecturers will be forced to fundamentally change their approach to teaching to accommodate the shift in student learning style. The associated implication of increased workload requires proactive and effective management. The critical factors for success will change with the implementation of e-learning courses, prior experience of using technology; the technological infrastructure; the lecturer will be the new key elements in the success of learning experience.

Universities can help students to achieve success by doing three things – a combination of theory, technology and practices. Firstly, theory –face-to-face session familiarizing students with the courseware will help to overcome the issue of prior experience. Secondly, technology – the functionality of technology infrastructure should be ensured before the course is implemented. This should be backed up by technical support from either the lecturer or technological expert. Finally, practices – human resources should be committed to the project at early stage and lecturers should be selected based on their attitudes towards technology, teaching style and ability to control the technology.

While recognizing the challenges associated with the variety of conceptions of teaching, this particular study takes a more narrow focus in attempting to identify the perceptions by students in a single university of blended approach in teaching courses that integrated face-to-face and technology. Therefore, the environments that were developed and studied were created by modifying the existing course structure by adding the e-learning technology into the existing curriculum set forth by the University, as well as to work within the time and budget constraints given, especially with the hardware and software facilities. In this manner, the research will in no

way affect the students' study under the present system but it will improve and extend students' learning and the lecturer's teaching techniques. Multimedia University is a highly fertile ground for conducting such research.

Acknowledgement

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