An Evaluation of i-Tutorial: A Multimedia Learning Material in Open University Malaysia

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***Abstract* – In distance learning both the instructor and students are separated, thus learning material plays a vital role in filing the gap which is not only a source of disseminating knowledge and information but also for motivating the learner to learn independently. As an open and distance learning institution, Open University Malaysia (OUM) provided a suite of learning materials for its learners which includes print and digital material. i-Tutorial is one of the digital learning material that is used in some of the courses in the university. It is a visual clip of a lecturer presenting content by using pen device on power point slides, digital movie/pictures or digital tablet. This research aims to investigate the perceived effectiveness of i-Tutorial by evaluating four major aspects of multimedia materials, they are: design, elements, instructional messages, and interactivity. A well-designed media-rich i-Tutorial will not only enhance learning and translate into better learning outcomes but provides a stimulating environment for learning and retaining information delivered. The research data was collected via an online survey and a focus group. The findings**

from the survey and discussion indicated that i-Tutorial was well received by the students for all the four multimedia factors and also regarded supportive in their learning

***Keywords* – i-tutorial, e-learning, multimedia materials**

INTRODUCTION

Open University Malaysia (OUM) is an open and distance learning university in Malaysia with a vision to be a leader and innovator in open learning. It has three missions: to be the leading contributor in democratising education; to develop quality education through multimode learning technologies; and to develop and enhance learning experiences towards the development of a knowledge-based society.

As part of its efforts to achieve these targets, OUM, through its Centre for Instructional Design and Technology (CiDT), has explored the use of multimedia learning materials. Consequently, the university introduced i-Tutorial, which is to be used alongside print modules and CD-ROMs as learning materials. i-Tutorial was formulated in order to provide a quality multimedia learning environment for the learners of OUM.

The i-Tutorial is a pre-recorded tutorial for web-based delivery incorporating digital learning material such as video, audio, images, slides, websites, software applications and others to create media-rich, relevant and appropriate interactive

presentations. In addition, the i-Tutorial concept suitable for online learners who do not attend face-to-face classes as frequent as students in the local universities.

The first i-Tutorial was developed in July 2006 for the course titled: Learning Skills for Open and Distance Learners (OUMH 1103). The i-Tutorial developed by Centre for Instructional Design and Technology (CiDT) to cater the OUM learners with e-learning material. The i-Tutorial is still under research and development stage. Therefore its implementation as one of the learning material is still at minimal.

MULTIMEDIA IN E-LEARNING

ODL institutions as well as conventional institutions recognise the potential of e-learning to improve the quality of teaching/learning interactions. E-learning technologies include a range of ICT-based or digital tools which may be delivered online (e.g. web-based courses) or offline (e.g. CD ROM). The tremendous growth of ICT has created a demand for education to be available at any time. Multimedia has a multitude of applications, especially in the e-learning environment.

Multimedia enhances the learning process by adding interaction to e-learning courses [1]. With the extensive use of e-learning in education, it is necessary to reflect on the importance and usage of multimedia in today's e-learning context.

Multimedia has a greater flexibility to handle e-learning compared to other media. Moreover, multimedia allows content to be updated at any time. Therefore, multimedia learning has been said to positively enhance online learning experience for users [1].

In addition, multimedia encourage learners to engage in different learning modes. These will allow them to adapt learning by communicating their sensory system towards audio, text, animation, video and graphic. The participation of the learners in multimedia learning will allow them to engage a multitude of senses.

As argued by [4], e-learning becomes more engaging when it is designed with interactive multimedia. Although multimedia enhances the learning process, too much usage of multimedia may confuse users. By identifying the purpose of multimedia in the e-learning context, more good results may be anticipated.

Finally, it can be inferred that the use of multimedia in the e-learning context has made a long-lasting impact on learners' thought and learning processes. [5] found that e-learning training which just requires learners to listen results in a low level of "recall and knowledge retention (25%)" compared to interactive media combination such as audio, video, animation, text and graphics which score much higher recall rates (75%). Therefore, from these studies it can be concluded that multimedia training programmes are of benefit to e-learning as they create an "engaging learning environment that can train people consistently and with higher learning retention"

CRITERIA FOR EVALUATING i-TUTORIAL

There are four aspects that were taken into consideration while evaluating i-tutorial, namely multimedia design, multimedia elements, multimedia instructional messages and interactivity.

A. Multimedia Design

In multimedia learning, multiple media can be used as our brain accesses information in non-linear ways. [3] considers that human working memory is limited and that people process visual and verbal information (e.g. narrated and online text) in separate cognitive channels, which work

simultaneously. [3] recognised five major principles that influenced the effectiveness of multimedia learning – multimedia, spatial contiguity, temporal contiguity, coherence and modality. These principles are explained below

(i) Media – Learning from the text and graphics is better than from text alone.
(ii) Spatial Contiguity – Learning from corresponding text and graphics is better when the corresponding text and graphics are presented simultaneously rather than consecutively.
(iii) Coherence – Learning is better when there is no super flours text, graphics or sound.
(iv) Modality – Learning is better with animation and narration than from animation and on-screen text

B. Multimedia Elements

Multimedia elements such as animation, video, audio, graphics and text are all important components that add interest and significant value to multimedia learning courses.

The combination of these various media provides a stimulating environment for learning and retaining the information delivered. In other words, multimedia "provides a means to supplement a presenter's efforts to garner attention, increase retention, and improve comprehension and to bring an audience in to agreement. [3]

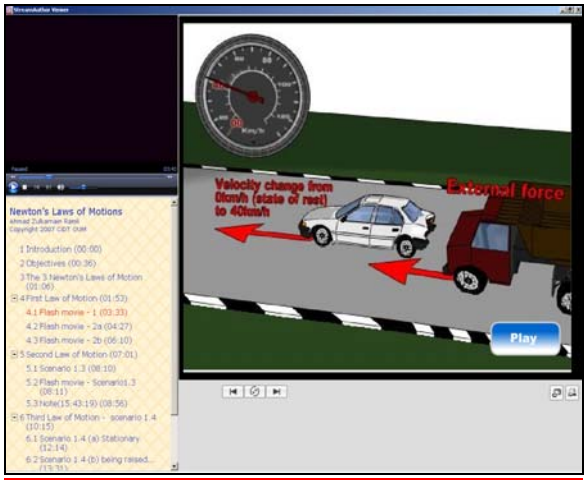

Fig. 1 Animation and text integrated with video lecture in i-Tutorial

C. Multimedia Instructional Messages

A multimedia instructional message is a communication using words and pictures that is intended to promote learning. This definition has three parts. First, the message part of the term reflects the idea that multimedia instructional messages are communications or presentations involving a teacher and a learner. Second, the instructional part of the definition reflects the idea that the purpose of the multimedia instructional message is to promote learning (including understanding) in the learners. Third, the multimedia part of the definition reflects the idea that the multimedia instructional message is presented using both words and pictures. [2]

Examples of multimedia instructional messages include words and pictures intended to explain how lightning storms develop, how car braking systems work and how bicycles tire pumps work.

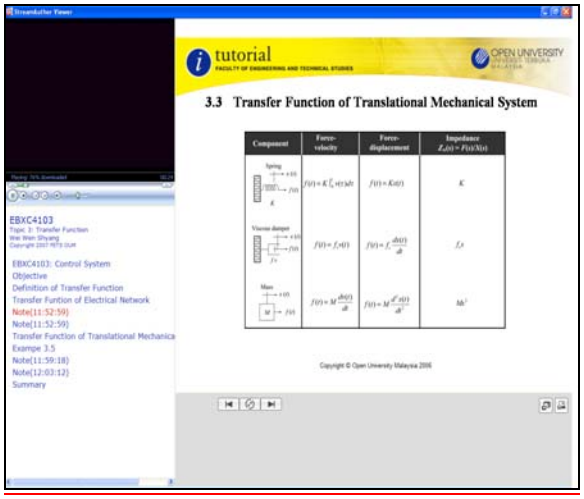

Fig. 2 Limited texts represented with graphical data in i-Tutorial

D. Interactive in Multimedia

Multimedia learning courses and application are effective methods to present educational materials because they contain one key ingredient: interactivity, which empowers the users to interact and have complete control on the flow of information. Multimedia enhances interactivity between the content and the user. [2] defined two-way interaction as interaction communication between course material and other computer or user that is directly connected to media such as TV, video or other responsive media. In addition, an interactive environment can be created by using mouse input, touch screens, voice commands, video capture and real-time interaction"

Interactive multimedia allows two-way interaction within multimedia course material, another computer or another user with direct response to the input, as opposed to one-way communication from TV, video and other non-responsive media. Interactivity in an interactive media allows the transfer of power to users to become active participants instead of passive. Users are allowed to explore a multimedia application as how they want it.

Therefore, the learning process absolutely depends on the users. It is how the users carry out the studies, either actively or passively. In interactive multimedia, a non-linear fashion could enhance the knowledge by allowing the user to navigate.

RESULTS OF EVALUATION OF i-TUTORIAL

The research data was collected via questionnaire and focus group. The questionnaire was administered in the September 2007 semester. Out of 300 e-mails sent, only 90 responses were received. Only five members participated in the focus group.

Majority of the respondents are in the 25 to 35 age category while the least number of respondents were aged 36 to 55. Based on the data, the majority of the respondents were female (77.8%) while the rest were male (22.2%).The survey showed 72.2% respondents were not exposed to i-Tutorial compared to only 27.8% who have used i-Tutorial.

The questions regarding multimedia are divided into FOUR main components which are:

(a) Multimedia Design (Table 1)

(b) Multimedia Elements (Table 2)

(c) Multimedia Instructional Messages (Table 3)

(d) Interactive Multimedia (Table 4)

TABLE 1
MULTIMEDIA DESIGN

QUESTIONS	SCALE (%)				
	1	2	3	4	5
Q18: The use of text, graphics, audio, video and animation attracts me to the iTutorial.	-	5.6	16.7	55.6	22.2
Q20: The placement of navigation buttons (Next, Previous, Synchronize, Maximise Video, Maximise Slide) is suitable for easy navigation.	-	-	16.7	72.2	11.1
Q26: I love to see colorful pictures in learning materials.	-	5.6	16.7	38.9	38.9
Q28: The navigation in the iTutorial is effective, clear and helps me to move from screen to screen.	-	-	44.4	44.4	11.1

Based on the findings, 55.6% of the respondents agreed that usage of text,

graphics, audio, video and animation attracted them to view i-Tutorial while only 5.6% of the respondents disagreed with the above statement. In addition, most of the respondents (72.2%) agreed that the placement of the navigation button is appropriate for the learner to easily navigate.

These statements were agreed to by the respondents, while 16.7% of the respondents did not have any idea on the navigation buttons and 11.1% strongly agreed that the navigation button was helpful. An equal percentage of the respondents (44.4%) agreed and (44.4%) were neutral about the effectiveness of the navigation in i-Tutorial.

Similarly, an equal percentage of respondents strongly agreed (38.9%) and agreed (38.9%) that they preferred to see colourful pictures in learning materials. Only a minority (5.6%) of the respondents disagreed with the statement.

Overall, we can conclude that multimedia design in i-Tutorial is appropriate although enhancement is needed. Based on the findings, we can infer that multimedia design captured users' attention to use the multimedia learning material.

TABLE 2
MULTIMEDIA ELEMENTS

QUESTIONS		SCALE (%)				
		1	2	3	4	5
Q19:	Multimedia elements such as text, graphics, audio, video and animation help me to understand the content better.	-	-	16.7	61.1	22.2
Q21:	I am able to click other sections in the slides while the video is still playing.	-	-	33.3	55.6	11.1
Q32:	I have the option of selecting different learning styles by viewing video, slides, graphics, text and at the same time hear the lectures.	-	5.6	33.3	44.4	16.7

Multimedia elements help learners to understand content better. This was agreed with by most of the respondents (61.1%) while 22.2% strongly agreed and 16.7% have no idea about it. The greater number of respondents (55.6%) agreed that they were able to view slides while the video was still playing, 33.3% of the respondents had no idea and 11.1% strongly agreed that they were able to view slides while the video was still playing.

Based on the findings, we can conclude that the multimedia elements used in i-Tutorial are more engaging.

TABLE 3
MULTIMEDIA INSTRUCTIONAL MESSAGES

QUESTIONS		SCALE (%)				
		1	2	3	4	5
Q22:	The learning material provided in the iTutorial is clear and easy to understand.	-	-	38.9	50.0	11.1
Q30:	I will be happy to get feedback whenever I answer a question.	-	-	5.6	50.0	44.4
Q31:	The iTutorial enhances explanation of the content.	-	-	27.8	61.1	11.1

Half of the respondents (50%) agreed that the learning materials in i-Tutorial were clear and easy to understand followed by 11.1% who strongly agreed and 38.9% who have no idea on the statement. A significant number (50%) of respondents expected feedback whenever answering a question and 44.4% strongly agreed on getting feedback while 5.6% of the respondents were still not sure on the above statement. Most of the respondents (61.1%) agreed that i-Tutorial was able to enhance the explanation of the content while 27.8% of the respondents were not sure of i-Tutorial and 11.1% strongly agreed that i-Tutorial enhanced the content. From the Table 3, we can infer that multimedia learning instruction in the i-Tutorial is clear and easy to understand. Perhaps, it helps the learner to reach higher order of thinking. On the whole, all the participants happy with the i-Tutorial learning material.

TABLE 4
INTERACTIVE MULTIMEDIA

QUESTIONS	SCALE (%)				
	1	2	3	4	5
Q23: The iTutorial helped me to visualise how things look like e.g. cells, movements.	-	11.1	33.3	44.4	11.1
Q24: I enjoy viewing animation or any movement in the e-contents/websites.	-	-	22.2	50.0	27.8
Q29: I have fun with games, quizzes and puzzles while using the learning material.	-	5.6	22.2	55.6	16.7
Average Score	-	5.6	26	50	18.5

From the total number of respondents, 44.4% agreed that i-Tutorial was an interactive medium because it helped to visualise things. A small number of respondents (11.1%) disagreed that i-Tutorial helped them to visualise. Half of the respondents (50%) agreed that they enjoyed viewing animation. Another 27.8% of the respondents strongly agreed that they enjoyed viewing animation in e-content/ websites while 22.2% were neutral. From the statements above, we can conclude that a significant number of respondents enjoyed animation in the e-content/ websites. More than half of the respondents (55.6%) said they preferred learning materials with games, quizzes and puzzles. Just 5.6% of the respondents disagreed about having fun with interactive games. In summary, interactive multimedia used in i-Tutorial attracted users' attention by providing interaction between user and content. This leads to a more engaging learning environment for learners.

The findings from the focus group were not any different from the questionnaire survey. All the focus group participants were satisfied with the multimedia design, elements, instructional messages and interactivity.

CONCLUSION

Based on the findings, it could be said that multimedia learning encouraged learners to be active learners. i-Tutorial has achieved its goal in delivering multimedia learning environment at OUM. This can be clearly seen from the findings where 100% of the respondents agreed on the implementation of i-Tutorial as one of the learning materials.

In addition, the multimedia design, multimedia elements, multimedia instructional messages and interactivity in i-Tutorial achieved its objectives by engaging the participants in multimedia learning.

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