Study on the Extensive Use of Multimedia Element in Teaching Materials Among Lecturers in General Studies Department, Politeknik Tuanku Syed Sirajuddin, Perlis

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Abstract: The development of technology and multimedia has had a great impact in education. This study aims to evaluate the use of multimedia materials for teaching materials among lecturers in General Studies Department , Politeknik Tuanku Syed Sirajuddin (PTSS), Perlis. To achieve this goal, two objectives were identified; identifying the extent of multimedia elements used in T&L materials among lecturers in General Studies Department and identifying the positive impact on students' interest in T&L using multimedia elements. There are 6 multimedia elements evaluated namely text, graphics, audio, video, animation and interactivity. The proposed methodology for this study is the ADDIE model. The sample of this study were 10 lecturers of General Studies Department and 50 PTSS students which were randomly selected. This study uses questionnaires that was distributed to the lecturers and students. The findings revealed that the use of multimedia elements in T&L among the lecturers was moderate.

Key words: *teaching and learning, multimedia elements*

INTRODUCTION

The development of information technology as well as the use of computers brings great implications to human life including in education. It has helped the lecturers and students in teaching and learning process (T&L) and make it more interesting through interactive T&L materials. Ismail [1] states that a significant change should be made by educators in managing T&L in the classroom. The use of materials, teaching techniques and equipment in the classroom has changed. The Ministry of Education [2] states that the time has come to a learning culture to be changed from memory-based to knowledgeable and creative thinking using the latest technologies supports this statement.

The existence of multimedia technology is an important channel for the dissemination of information in teaching and learning while lecturers are the key to the success of multimedia technology applications. The development of multimedia technology promises great potential in changing the way people learn, how to get information,

how to customize each information, and so forth. Multimedia also provides opportunities for lecturers to apply various teaching and learning techniques and students should be given the opportunity to hold control power for a learning session.

The use of multimedia elements in the process of teaching and learning (T&L) creates an appropriate, easy-to-understand and quality learning environment. The combination of multimedia elements such as text, graphics, audio, video, animation and interactivity can create a conducive and fun learning environment [3]. According to Vijaya Kumaran KK Nair [4], multimedia creates an effective and fun learning situation, as students will remember 20% of what they see, 30% of what they see and hear and 60% - 70% of what they say and write.

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OBJECTIVE OF THE STUDY

i. Identifying the extensive use of T&L materials using multimedia elements among lecturers in General Studies Department.

ii. Identifying positive effects on students' interest in T&L using multimedia elements.

PROBLEM STATEMENT

Many lecturers in General Studies Department face the problem of applying the understanding to students in T&L process. That is why it has a less impact on students' interest in learning. It occurs when students find it is difficult to understand what are being taught in the classroom as well as showing less interest in learning sessions.

The use of multimedia elements for teaching materials in T&L process is a method that can help lecturers in General Studies Department to improve student performance for the courses learned. The use of multimedia software (a combination of multimedia elements) motivates students to make sure learning process is more interesting when students understand what they are learning.

RESEARCH QUESTIONS

In order to achieve the objectives of the study, the researcher listed some research questions:
i. What is the extent of multimedia elements use in T&L material among General Studies Department lecturers?
ii. Whether the use of multimedia elements in the T&L process can have a positive effect on the interests of students in the classroom.

SIGNIFICANCE OF THE STUDY

The importance of this study focuses on lecturers as content experts where this study is expected to:
i. Assist lecturers to review the teaching materials used are in line with the needs of students.
ii. Help lecturers plan T&L processes more effectively.
iii. Increase the productivity of lecturers in the T&L process in polytechnic.

LITERATURE REVIEW

Literature review is an important part used to obtain information of the study.

Definitions of Multimedia

Multimedia generally refers to the combination of various media such as text, graphics, audio, video, animation and interactivity to produce an interesting, interactive and effective presentation of information using computer technology [3]. Each element will have a great impact on a communication process or information distribution.

Multimedia Elements

There are six (6) main elements of multimedia:

i. Text
It is the primary basis for distribution of information. The use of different types of fonts make the information presentation become more interesting. It emphasizes the content that you want to convey.

ii. Graphic
It is the most important element that visually impels a presentation of information. It helps disseminate information more effectively and interestingly.

iii. Audio
A sound that can catch users' attention. It can affect one's emotions, thoughts and actions. Audio is able to increase interest and help them to remember better.

iv. Video
It is the most dynamic and realistic element. It make a presentation more interesting and fascinating.

v. Animation
It refers to the process of making an object lively or to give a moving image to something essentially static.

vi. Interactivity
It enables access of information from one display to another without having to follow the sequence.

Multimedia in Education

Multimedia is the latest information technology that allows integrating text, graphics, audio, video and animation elements as a presentation control to enable learning process to be significant. In education, T&L's process by using computer-based multimedia is an enjoyable experience while helping to facilitate understanding of a concept easily and quickly. The use of multimedia in education is also capable of producing technology-literate students, capable of thinking creatively as well as using technology effectively in T&L.

RESEARCH METHODOLOGY

The proposed methodology for this study is the ADDIE model. This methodology will explain the method of conducting the research to study the extensive use of multimedia elements in teaching materials among lecturers of the General Studies Department, Politeknik Tuanku Syed Sirajuddin (PTSS).

Design Development

ADDIE model is used to study the extensive use of multimedia elements in teaching materials among General Studies Department lecturers, PTSS. Figure 1 shows the development phase that covers the Analysis, Design, Development, Implementation and Evaluation phase.
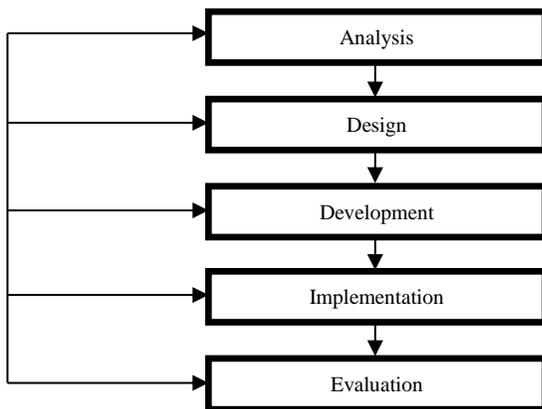

Figure 1.0: ADDIE Model
source: Jamaluddin, Baharuddin & Zaidatun [5]

The analysis phase involves the process of identifying and defining what needs to be learned. In the analysis phase, the researcher will perform an analysis process on the multimedia elements used in T&L. In this phase, the researcher will distribute questionnaire and conduct interviews among General Studies Department lecturers and students to obtain the results of the study.

After the phase of analysis, the design phase will be the guideline for the whole idea and concept for the interface, structure, teaching approach, learning theory, media type and technology involved. The courseware prototype will also be built on this phase to see roughly the framework.

The next phase is the development phase where the process of producing the material is the main content. The development phase is a continuation of the design phase to develop a courseware that contains all multimedia elements. It will be used as a guide to lecturers at General Studies Department to develop interactive software for T&L use.

The next phase is the implementation phase where the process of applying and using the material developed into the real context. Implementation phase plays a role in implementing pilot test on the generated courseware. In this process, some sample students and lecturers will be selected to use the courseware. This phase will involve real learning environment and involve students and lecturers.

The final phase of the evaluation phase is to evaluate the quality of the teaching application after undergoing the implementation phase. It involves the testing process of the material produced. This test is conducted throughout the development process to ensure that identified weaknesses are improved to generate more results that are productive. When the evaluation phase is completed, researchers are able to identify the strengths and improvements that must be made to ensure the success of the project.

Research design

This research was carried out in a form of survey to examine the extent of the use of multimedia elements for teaching and learning materials among General Studies Department lecturers, PTSS. In addition, the study aims to see the positive impact on students' interest in T&L in the classroom using materials based on multimedia elements. Data were obtained through a questionnaire instrument distributed to General Studies Department lecturers and students. The data obtained were analyzed in percentages and min of each item. The high average mean per item will show encouraging acceptance while low score indicates otherwise.

Sample of Study

The sample of the study consisted of lecturers and students from General Studies Department, PTSS. A total of 10 lecturers and 50 students were randomly selected.

Research Instruments

The data for this research were collected among lecturers and students of General Studies Department, PTSS by using questionnaire. Questionnaire were distributed to randomly selected respondents; 10 General Studies Department lecturers and 50 students.

Lecturers 'questionnaire

The questionnaire have been developed to get feedback from lecturers regarding the extent of use of multimedia elements in the teaching process. The questionnaire

consists of 6 items. It assesses the effectiveness of the use of multimedia elements in the teaching process.

Students 'questionnaire

Students 'questionnaire were developed to get students' responses to the learning effects in the classroom using T&L materials with multimedia elements. This questionnaire was adapted from the questionnaire used by Saridah Hussein [6] in her study titled The Effectiveness of Multimedia Software Utilization in Teaching and Learning Locus Two Matra. The questionnaire is a student survey findings to the interest in T&L using multimedia element based on teaching materials consisting of 7 items in Likert Scale 4. Scale 1 indicates a high level of disagree against the stated statement while the scale 4 indicates a high level of strongly agree.

RESEARCH FINDINGS

The findings of the research were divided into two findings that are the General Studies Department lecturers and the findings from the students.

Lecturer Survey Findings

The results of the analysis conducted on the questionnaire received from 10 respondents who are lecturers of the General Studies Department found that 100% of respondents used teaching materials in the form of multimedia in their teaching process. However, the percentage of multimedia elements used by lecturers is different. Table 1.0 shows the percentage of usage of multimedia elements among lecturers.

Table 1.0: Percentage of using multimedia elements among General Studies Department lecturers

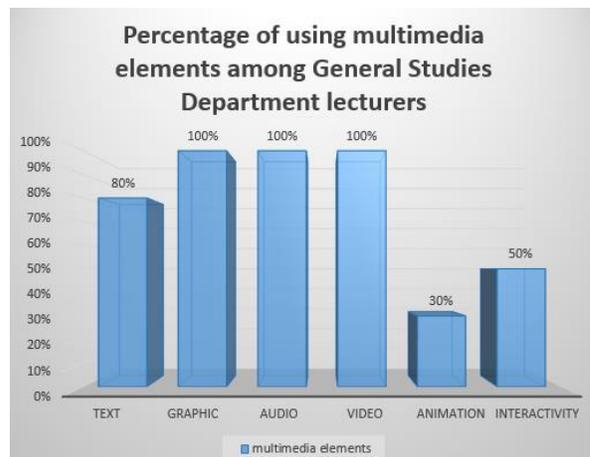| Multimedia Element	Percentage (%)
Text	80%
Graphic	100%
Audio	100%
Video	100%
Animation	30%
Interactivity	50%

Figure 2.0: Percentage graph of using multimedia elements among General Studies Department lecturers

Based on Table 1.0 and Figure 2.0, it is found that graphic, audio, video and text elements are the most used elements of lecturers in the teaching process in the classroom with a percentage of 100% and 80%. The use of animations elements recorded the lowest percentage of usage among lecturers; 30%. This percentage shows the likelihood of the difficulties and constraints of lecturers in producing teaching and learning materials in the form of animation.

The interactivity element also shows a low percentage of only 50%. This percentage is driven by time constraints faced by lecturers in producing multimedia materials that are interactive in their teaching process.

For the aspect of effective use of multimedia elements in the teaching and learning process, items are expressed in Likert scale format where respondents are required to answer questions according to the scale given:

Table 2.0: Likert Scale Format for Lecturer Questionnaire

Score Value	Score
Disagree	1
Less Agree	2
Agree	3
Strongly Agree	4

Table 3.0 shows the findings of the questionnaire regarding the positive effects of lectures' interest in T&L using multimedia element based on teaching materials'. Total min calculated for each question. Evaluation of the

questionnaire is evaluated through the mean value of all questions through the following ranges:

Min $\geq$ 3 = High Level Agreement
Min <3 = Low Level Agreement

Table 3.0: Percentage survey results based on scale for feedback 'The positive effects of lectures' interest in T&L using multimedia element based on teaching materials'

No	Item	Disagree (1)	Less Agree (2)	Agree (3)	Strongly Agree (4)	Min
1	Does the use of multimedia elements capable of achieving T&L objectives?	0%	0%	20% 2 person	80% 8 person	3.80
2	Does the use of multimedia elements simplify the T&L process based on Outcome Based Education?	0%	0%	30% 3 person	70% 7 person	3.70
3	Does the use of multimedia elements encourage students to think critically and creatively?	0%	0%	30% 3 person	70% 7 person	3.70
4	Does the use of multimedia elements improve students memory in the T&L process?	0%	0%	20% 2 person	80% 8 person	3.80
5	Does the use of multimedia elements help in the T&L process more effectively?	0%	0%	30% 3 person	70% 7 person	3.70
6	Does the use of multimedia elements important to increase productivity in T&L process in polytechnics?	0%	0%	20% 2 person	80% 8 person	3.80

Average Mean = 3.75

Based on Table 3.0, it was found that 80% of respondents strongly agreed that the use of multimedia elements capable of achieving T&L objectives and 20% said agreed. Min for this question is 3.80 where lecturers strongly agreed that the use of multimedia elements is able to achieve T&L objectives. This finding suggests that multimedia elements are effective in explaining a concept of teaching to students.

In addition, 70% of respondents strongly agreed that the use of multimedia elements simplify the T&L process based on Outcome Based Education (OBE) and 30% said agreed. Min for this question is 3.70 in which the lecturer agreed that the use of multimedia elements simplify the T&L process based on Outcome Based Education (OBE). Good and appropriate multimedia materials used in T&L enable students to explore the contents of the lesson independently. This indirectly supports OBE-based learning in accordance with the requirements of the Department of Polytechnic Studies (JPP).

Questions asking whether the use of multimedia elements encourages students to think critically and creatively, as 70% of respondents strongly agreed and

30% said agreed. Min for this question is 3.70 where lecturers agreed that the use of multimedia elements encourages students to think critically and creatively. This is because the use of multimedia elements can stimulate students' thinking skills based on a simulation or analogy shown by the lecturer.

Additionally, 80% of respondents strongly agreed and 20% agreed that the use of multimedia elements was able to improve student memory in the T&L process. Min for this question is 3.80. The combination of multimedia elements in interactive form can improve students' memory. This finding is supported by Vijaya Kumaran KK Nair [4] in her study of the effectiveness of the use of multimedia software where the findings suggested that multimedia creates an effective and fun learning situation as students will remember 20% of what they see, 30% of what they see and listen and 60% - 70% of what they say and write.

Questions asking whether the use of multimedia elements help in the T&L process more effectively, as 70% of respondents strongly agreed and 30% said agreed. Min for this question is 3.70 where lecturers

agreed that the use of multimedia elements help in the T&L process more effectively.

Lastly, 80% of respondents strongly agreed and 20% said agreed with the questions use of multimedia elements important to increase productivity in T&L process in polytechnics. Min for this question is 3.80 where lecturers agreed that the use of multimedia elements able to increase productivity in T&L process in polytechnics

Student Survey Findings

The results of this analysis were carried out on the questionnaire received from 50 respondents who are students from Design and Visual Communication Department. For the aspect of effective use of multimedia elements in the teaching and learning process, items are expressed in Likert scale format where respondents are required to answer the questions according to the scale given:

Table 4.0: Likert Scale Format for Student Questionnaire

Score Value	Score
Disagree	1
Less Agree	2
Agree	3
Strongly Agree	4

Table 5.0 shows the findings of the questionnaire on the positive effects of students' interest in T&L using multimedia element based materials. Total min was calculated for each question. Evaluation of the questionnaire was evaluated through the mean value of all questions through the following ranges:

Min ≥ 3 = High Level Agreement
Min <3 = Low Level Agreement

Table 5.0: Percentage survey results based on scale for feedback 'The positive effects of students' interest in T&L using multimedia element based on teaching materials'

No	Item	Disagree (1)	Less Agree (2)	Agree (3)	Strongly Agree (4)	Min
1	I like to attend classes taught using multimedia-based materials.	0%	0%	60% 30 person	40% 20 person	3.40
2	I focus in classes taught using multimedia-based materials.	0%	0%	66% 33 person	34% 17 person	3.34
3	I fully understand what the lecturers are teaching using multimedia material.	0%	0%	20% 10 person	80% 40 person	3.80
4	I appreciate all the examples, simulations and analogies shown by lecturers.	0%	0%	56% 28 person	44% 22 person	3.44
5	I do not feel bored while learning process using multimedia material.	0%	0%	30% 15 person	70% 35 person	3.70
6	I was convinced to answer the questions given after T&L process using multimedia material.	0%	0%	52% 26 person	48% 24 person	3.48
7	I can easily understand a concept that the lecturers are teaching using a combination of various multimedia elements.	0%	0%	50% 25 person	50% 25 person	3.50

Average Mean = 3.52

Based on Table 5.0, it is found that 100% of students like to attend classes taught using multimedia-based materials, 60% said they agreed and 40% said strongly agreed. Min for this question is 3.40 where students like

to attend classes taught using multimedia-based materials. This finding suggests that T&L that use multimedia elements are able to encourage students to attend classes. The fun learning environment of the use of multimedia elements may drive this.

Additionally, 66% said agreed that they can focus in classes taught using multimedia-based materials and 34% said they strongly agreed. Min for this question is 3.34 where students can focus on classes taught using multimedia materials. This shows that the use of multimedia elements is able to maintain the focus of the student on what the lecturer has taught. This is due to the use of multimedia elements that are able to explain a concept more clearly, such as a description of a concept with the support of the use of animation elements and videos that may not be understood solely by explanation.

Questions asked whether students fully understand what the lecturers are teaching using multimedia-based materials, 80% said they strongly agreed and 20% said they agreed. Min for this question is 3.80 where students agreed that they fully understand what is taught by lecturers using multimedia materials. It proves that the use of good multimedia material can actually improve students understanding.

In addition 56% said they agreed that they appreciate all the examples, simulations and analogies shown by the lecturers and 44% said strongly agreed with the statement. Min for this question is 3.44 where students appreciate all the examples, simulations and analogies shown by lecturers using multimedia elements. This is because the use of multimedia elements and the form of simulation and analogy can facilitate the student process to understand and translate a concept or theory that has been learned.

Additionally, 70% said strongly agreed and 30% said agreed with statement that they do not feel bored while learning process using multimedia material. Min for this question is 3.70 where students do not feel bored while T&L process.

Questions asking whether they convinced to answer the questions given after T&L process using multimedia material., as 52% of respondents agreed and 48% said strongly agreed. Min for this question is 3.48 where students convinced to answer the questions given.

Lastly, 50% of respondents strongly agreed and 50% said agreed with the questions that they can easily understand a concept that the lecturers are teaching using a combination of various multimedia elements. Min for this question is 3.50.

Implications and Recommendations

This study was conducted to examine the extensive use of multimedia elements in teaching materials for teaching and learning process among lecturers of the Department of General Studies, Politeknik Tuanku Syed Sirajuddin, Perlis.

Implication of Study

The results from the findings as a whole find that the extensive use of multimedia elements in T&L lecturers of General Studies Department is at a moderate. Based on the findings of the study, there are several implications that can be considered together for the benefit of the students:

i) Lecturers should be aware that each student has different levels of intelligence and learning methods, so lecturers should diversify teaching methods using all multimedia element especially animation elements, so that the learning process becomes more meaningful and appropriate to the different levels of learning in the student.

ii) The lecturer also needs to plan the appropriate method for each teaching content to facilitate the student to understand the content. Integration of various multimedia elements can improve student understanding.

Recommendations

Based on the results of this study, there are some follow-up recommendations that the researcher thinks should be implemented as an important step in ensuring the learning and teaching process of the student is better and more effective. Among the recommendations that need to be considered include:

i) The department should encourage the lecturers to develop multimedia teaching materials using all multimedia element and further promote the sharing of teaching materials among lecturers especially using animation element.

ii) The department also needs to organize appropriate courses especially in animation to help lecturers in developing multimedia teaching materials effectively.

CONCLUSION

The latest development in information technology, especially multimedia technology have given a new breeze to the use of computers. Multimedia also provides a variety of opportunities for lecturers to apply

various teaching techniques and students should be given the opportunity to hold control power for a learning session. The findings revealed that the use of multimedia elements in T&L among the lecturers was moderate. The average mean of the questionnaire conducted on the lecturers was 3.75 and the average mean of the questionnaire conducted on the students was 3.52. Indirectly it is found that lecturers are more likely to use multimedia elements for their teaching and learning materials, while students are also more focused in the classroom against T&L using teaching materials that contain multimedia elements. It can help the teaching and learning environment more effective and make the learning process more realistic.

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