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ERD Plus as A Solution for Teaching and Learning of Database System Course

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Abstract

Nowadays, the 'chalk and talk' learning approach has nearly been replaced by online teaching and learning methods all over the world. In two decades, the Internet has changed the teaching and learning paradigm resulting in better learning outcomes while combating the reduction of resources, especially in tertiary level education (Nguyen, 2015). The approach of online and blended learning has been embedded in order to improve the quality of teaching and learning accordance to the Malaysia Education Development Plan 2015-2025 (Higher Education) which focuses on online learning as an important component in higher education. The use of online modeling platform of ERD Plus has given the opportunity to students to learn by themselves at their preferred time. The study aims to focus on the effectiveness of using ERD Plus, a web-based modeling platform as a learning tool for topic Database Model in DEC40073 Database System course. 50 students from Electrical Engineering Department of Politeknik Sultan Haji Ahmad Shah, Kuantan Pahang who took DEC40073 Database System course during December 2019 session had been selected as respondents. The results of the study show the increasing marks of students' assessment after using the ERD Plus simulation in related topics showing that the experience they gained from the online modeling platform prepares them to answer the assessment question accurately.

Keyword: Online learning, blended learning, database model

Introduction

Nowadays the demand of using online learning tool has grown extensively as various online learning platform made available through the Internet. Many scholars have agreed that performing teaching and learning through online over the Internet has brought many benefits and effectiveness both to students and educators. The approach of online and blended learning has been embedded in order to improve the quality of teaching and learning accordance to the Malaysia Education Development Plan 2015-2025 (Higher Education) which focuses on online learning as an important component in higher education. Moreover, online learning also supports the professional development of students through students centered learning activities via online platforms (Bowen, 2013). Thus, the use of online modeling platform of ERD Plus has given the opportunity to students adapting the student-centered learning concepts by learning by themselves at their preferred time and space.

To ensure that the quality of teaching and learning is constantly improved by time, researchers have conducted a study on the effectiveness of using an online modeling platform for teaching and learning of DEC40073 Database System course. In order to achieve the effectiveness of using ERD Plus, several topics in the Database System course selected as targeted topics. The topics are Entity Relationship Diagrams, Relational Data Model and Physical Data Model. These topics were selected based on the poor achievement of students' assessments and understanding about that particular topics.

ERD Plus is a web-based database modeling software developed by Loyola University Chicago in partnership with Aptitive, a data analytics consulting firm based in Chicago, Illinois from the United States. This web-based modeling platform has been chosen as an online learning platform due to its features as an open source web-based application that does not acquire any installation to student's workstation either in institution facilities or the student's personal computers. The web-based features also enable students to perform online learning by accessing the platform using their mobile devices from anywhere at any time. Students can manipulate all the modeling tool provided through the website

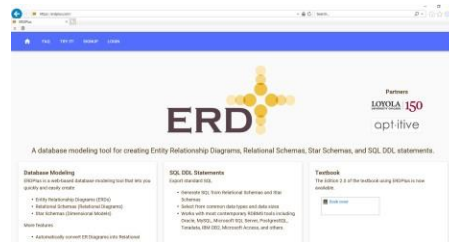


Fig.1 ERD Plus Interface

Problem Statement

Based on the items analysis of continuous assessment of DEC40073 Database System, more than 50% of students from Diploma In Electronic Engineering (Technology Computer), Electrical Engineering Department of Politeknik Sultan Haji Ahmad Shah who enrolled in this course during June 2019 session had shown weaknesses in the concept of Database Model and Design. Most of them were not able to design the correct model based on sample problems given through the assessment. Findings from the questionnaires and interviews conducted to them, 75% of the respondents did not like to ask the lecturer if they did not really understand the concept of Database Model, Furthermore, around 83% of them were not interested in finding other references on their own and consequently resulted in poor achievement of the continuous assessment.

Research Question

This research has been conducted based on two main question:

- i. Does the use of ERD Plus as online learning tool increase or decrease student's achievement in Database System course?
- ii. Is ERD Plus suitable to be used as an online learning tool based on these four specifications: user friendly, interactivity, user handling and suitability?

Research Objective

Generally, the aim of this research is to find out the effectiveness of using the ERD Plus which is an online learning platform to increase students' understanding and achievement in the continuous assessment of DEC40073 Database System course. The objectives of this research are to:

- i. Evaluate the effectiveness of online learning using the ERD Plus based on student's achievement in the continuous assessment.
- ii. Evaluate students' interpretation regarding four elements of the interfaces designed in ERD Plus as an online learning platform.

Literature Review

In recent years, technology in the field of education has evolved over time. The use of computers has become increasingly important to improve the quality of teaching and learning. Computer applications today are not only focused on using the computers and software, but also integrated in the teaching and learning of certain subjects through ample of online learning platforms available through the Internet. Privileges and facilities provided by online learning platform can enhance students' achievement in learning in the classroom (Azelin Mohamed Noor, 2012).

Scholars agreed that the use of online learning's platform by educators can certainly reduce the challenge for the educators in balancing teaching loads. For excellent students, they have extra time and the opportunity to relax while for weak students they have the opportunity to repeat learning several times (McGinnis, 2005).

All Polytechnic Institutions in Malaysia are no exception in laying the policy for teaching and learning to be implemented in the form of online and blended learning. This has been included in the e-learning policy that was published in 2012. The Malaysian Education Development Plan (Higher Education) 2015-2025 launched requires all higher educational institutions to carry out teaching and learning based on online and blended learning. Therefore, teaching and learning based on online learning must be

Copyright © 2020 Virtual Symposium on Teaching and Learning (VSTL2020) e-proceeding. carried out not only to fulfill the policy of the institution itself but also to meet the vision and aspirations of the national education.

Research Methodology

The method used in this research is divided into two which are:

- i. quantitative method that used questionnaires as the research instrument to evaluate student's interpretation regarding four elements of the interfaces designed in ERD Plus.
- ii. data collection methods through Database Model topic related assessment tests that have been conducted before and after using the ERD Plus web-based design platform.

This study was conducted by targeting a group of students who had enrolled the course which are selected from 50 students of Diploma In Electronic Engineering (Technology Computer) from Electrical Engineering Department, Politeknik Sultan Haji Ahmad Shah, Kuantan Pahang who enrolled DEC40073 Database System course during December 2019 session.

Summary of Findings and Discussion

a) Questionnaires

Researchers have prepared a set of questionnaires based on QUIS (Questionnaire for User Interface Satisfaction) developed by Chin et al (1988). The original QUIS has been altered and modified to meet the research questions and eventually evaluates student's interpretation regarding four aspects of the interfaces designed in ERD Plus as an online learning platform to master the topic of Database Model in DEC40073 Database System course.

In this research, Likert Scale with five levels of agreements has been applied to respondents. The five points of agreements are: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. The tendency level of mean score is summarised in **Table 1** while **Table 2** onwards represents the mean score for each element inspected in the questionnaires.

Table 1
Mean Score Tendency Level

Mean Score	Level of Tendency
1.00 – 2.33	Low
2.34 – 3.67	Medium
3.68 – 5.00	High

Source: Landell 2001

Table 2
Items for user friendly element

No	Item	Mean	Level of Tendency
1	User friendly display	4.30	High
2	Easy accessible menu	3.25	Medium
3	Easy folder navigation menu	2.54	Medium
4	Helpful option to navigate between menu	3.77	High
Total Score		3.46	Medium

Based on Table 2, there are certain items that show mean scores at medium level. This situation happens most probably by lack of experience in using ERD Plus and a modeling tool. As a whole mean score for user friendly elements is medium which is 3.46

Table 3
Items for interactivity elements

No	Item	Mean	Level of Tendency
1	Interactive menu for each modeling phase	4.04	High
2	Easy to manoeuvre modeling canvas	3.58	Medium
3	Diagram can be change into different data model accordingly	4.17	High
Total Score		3.93	High

Findings from Table 3 shows a mean score of 3.93 for the interactivity element which clearly illustrates that the ERD Plus modeling tool that had been developed are interactive in nature for students to practice online learning.

Table 4
Items for procedure handling Element

No	Item	Mean	Level of Tendency
1	Easy to handle Entity design and setting	3.85	High
2	Clear option of Attribute preferences	3.70	High
3	Clear option of Relationship cardinality	4.07	High
4	Various types of Relationship notation	4.20	High
5	Easy to understand SQL DDL statements	3.53	Medium
Total Score		3.87	High

As for the procedure handling element, with a mean value of 3.96 proves that the web-based application produced is beneficial and helpful for the students in mastering the concept of Database Model Design.

Table 5
Items for suitability as a learning tool Element

No	Item	Mean	Level of Tendency
1	Helpful online Data Modeling platform	4.04	High
2	Increase understanding of Database Model	3.88	High
Total Score		3.96	High

Lastly for the suitability of ERD Plus as a learning tool element, the overall item has recorded a high score with the overall mean value which is also the highest at 3.96. Thus, it shows that students are very keen in using the web-based platform in their online learning journey.

b) Post Test and Pre-Test

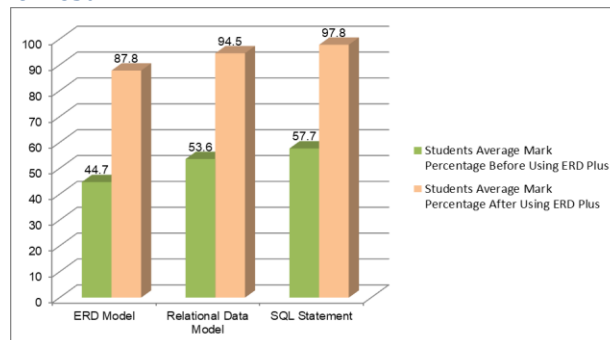


Fig.2 Pre Test And Post Test Average Marks

Based on **Fig. 2**, we can see a clear significant increase for students' average marks in Post Test for all topics related to Database Model compared to Pre test that were obtained by the students before using ERD Plus as a modeling tool. This result also proves that there is an improvement of understanding related topics among students after applying ERD Plus Database Modeling tool via online learning.

Conclusion

This research shows that applying an online learning approach using ERD Plus platform by students can increase their percentage of understanding in certain topics of DEC40073 Database System course. Furthermore, the research also proved that online learning approaches can have a positive impact and effective impact on students' academic achievement because the experience they gained from online learning platform prepares them to answer the assessment question accurately.

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References

- Azelin Mohamed Noor et al. (2012). *E-books in Malaysian primary schools: the Terengganu chapter*. World academy of science, engineering and technology 66: 298-301.
- Bowen, W. G. (2013). *Higher education in the digital age*. Princeton University Press.
- J. P. Chin, V. A. Diehl, and K. L. Norman (1988). *Development of an instrument measuring user satisfaction of the human-computer interface*. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '88), pp. 213–218.
- Landell, K. (2001). *Management by Menu*. London: Wiley and Son Inco.
- McGinnis, M. (2005). *Building a successful blended learning strategy*. LTI Newslines www.ltimagazine.com.
- Tuan Nguyen (2015). *The Effectiveness of Online Learning: Beyond No Significant Difference and Future Horizons*. MERLOT Journal of Online Learning and Teaching