Android Application Development: Basic SQL E-Learning

Norazlina Binti Abd Muttoleb  
Department of Electrical Engineering, Politeknik Tuanku Syed Sirajuddin, Perlis  
Email: norazlinaam@ptss.edu.my

Mas Guieta Bt Aton  
Department of Electrical Engineering, Politeknik Tuanku Syed Sirajuddin, Perlis  
Email: masguieta@ptss.edu.my

Nafisah Binti Abdullah  
Department of Electrical Engineering, Politeknik Tuanku Syed Sirajuddin, Perlis  
Email: nafisahabd@ptss.edu.my

ABSTRACT

This study describes the steps taken to design and develop Basic SQL E-Learning Application for DEC40073 Database System. Basic SQL E-Learning application is an Android application based that is build using Android Studio which suitable for android devices. This application allows students directly learn MYSQL using their own android smartphone. The main objective is to develop a mobile learning application that provides notes and exercise using MYSQL that can improve focus and motivation among engineering’s students. The students can perform exercise that is divided into two topics, which are Data Definition Language (DDL) and Data Manipulation Language (DML), which contain in the syllabus. The Methodology used to build this application is ADDIE model that involves five phases (Analysis, Design, Development, Implement and Evaluation). The student will be able to test their knowledge in SQL Queries by using basic operations like Create, Insert, Update, Delete, Select statement and provided with mark at the end of exercise. Upon demonstration, students indicated the positive response and interested to answer the entire question in the exercise provided. Hence, this study discussed the designing and developing of Basic SQL E-Learning on polytechnic students in learning Database System. In the future, this application can be upgraded with music while answering the quiz and compatible with other platforms.

Keywords: Basic SQL E-Learning, MYSQL, Database System Students, ADDIE Model

1.0 INTRODUCTION

Mobile applications are the future of education sector where offering educators new platforms to engage students with class material and facilitate classroom activities. Mobile technology has drastically changed the cultural norms and individual behaviours. (Sarwar & Soomro, 2013). Teaching and learning by using traditional methods alone, are not able to draw attention of students during class. It must be combined with interactive learning style, using multimedia elements, mobile and ICT technology (Ghavifekr, S, & Rosdy, 2015). Basic SQL E-Learning Application has been developed for Database System DEC40073 offered in Malaysia’s Polytechnic in order to embrace new style of education that injected by mobile technology.
According to Nurkaliza Khalid, Hairuddin Jaafar, 2015, motivation is an important aspect of instructional strategy. Motivation ensures that the users keep on using the learning objects after the initial usage. It is important for developers to put some element of motivation in mobile learning to get retention from students to focus during classes compared to traditional methods. Despite its importance, most developed mobile learning applications have neglected the motivation aspect. This encourages retention among users especially if the learning content is complicated (Khalid et al., 2015). Therefore, Basic SQL E-Learning is designed in order to cater all the problems faced by most e-learning users, which to be continuously engaged in the mobile learning process.

Many subjects have to be learnt by students of Diploma Electrical Engineering in Polytechnic, one specialized subject for Diploma Electrical Engineering (Computer) students are DEC40073 Database System. This is compulsory subject with 60% of continues assessment and 40% final exam. Database system course offers a comprehensive coverage of basic concept and application of data manipulation. Student will learn the fundamental concepts and techniques for designing and developing database and manipulating data using Structured Query Language (SQL). Upon completion of this course, students should be able to manipulate correctly Structured Query Language that including Data Manipulation Language (DML) and Data Definition Language (DDL). Basic SQL E-Learning developed to provide quick and easy notes. Besides that, student will be able to test their knowledge in SQL Queries by using basic operations like Create, Insert, Update, Delete, Drop and Select statement in MYSQL. Students will get instant mark after answering the exercise given. Development of Basic SQL E-Learning application is based on ADDIE model.

2.0 LITERATURE REVIEW

The increment in the use of mobile devices encourages the use of mobile learning as a learning platform have also integrated mobile learning application to enhance the learning experience (Al-Fahad, 2009; Bayaa, 2009; Chen, 2008). One of the benefits using mobile learning is to increase motivation among students in learning. Motivation is an important aspect of Instructional strategy. Motivation ensures that the users keep on using the learning materials after the initial usage (Khalid et al., 2015). As far as traditional methods are considered, expected to carry a satchel of books, copies and indulge into the traditional method of writing during classes. However, not every student can absorb knowledge while busy writing notes, it might cause boredom and loss focus. Hence, we need to make sure that a student’s focus is only on one thing at a time: This makes learning fun and more engaging. (Samual Roy, 2017). According to Shih (2007), the mobile learning applications should create an enjoyable learning environment since the mobile learning applications lack the luxury of face-to-face interaction with its audience.
2.1 Android Studio

Android studio built for Android to accelerate the development of application to the highest quality application for every Android device. According to (Mehul, 2015), more than 76.6% of the Smartphone’s, including HTC, LG and Samsung Models use Android as their operating system (OS), and expecting that Android will be in smart watches. Android powered devices including tablets have become the foremost needed of all the tech-savvy people across the world and the prime reason is it provides an open source platform.

2.2 ADDIE Model

Development of Basic SQL E-Learning is based on ADDIE model. ADDIE first appeared in 1975. ADDIE comes from simple acronym (Analysis, Design, Development, Implementation, and Evaluation). Each phases are related to each other and interacts with each other. The ADDIE Model is merely colloquial term used to describe a systematic approach to instructional development, virtually synonymous with instructional systems development (ISD) (Michael Molenda, 2003). ADDIE model is flexible in different steps involve and all the processes can be performed in a non-linear manner. Many instructional scientists have expressed that, all the phases in the ADDIE model are listed in a linear order, but are in fact highly interrelated and typically not performed in a linear but in an interactive and cyclic fashion by Van Merrienboer, 1997.

2.3 Survey of Different SQL application

i. Learn SQL Application by SoloLearn

Figure 1 shows the interface for SoloLearn’s SQL tutorial application by Solo Learn Education. Learn SQL in a greatly improved learning environment with more lessons, real practice opportunity, and community support. Learn SQL covers an array of SQL-related topics, such as:

- Database Basics
- Key SQL Statements
- Retrieving, Updating, and Filtering Data
- Functions and Subqueries
• Creating, Updating, and Deleting Tables
• Joining Multiple Tables
• Creating Custom Views

ii. W3 School Application by Stone Age Education

![Fig 2 Interface of W3 School Application (Stone Age Education, 2020)](image)

Figure 2 shows the interface of W3 School Application by Stone Age education. W3 Schools is a web developer’s application, with tutorials and references on web development languages such as HTML, CSS, JavaScript, PHP, SQL, W3.CSS, and Bootstrap, covering most aspects of web programming.

3.0 RESEARCH METHODOLOGY

3.1 Design of Development Basic SQL E-Learning using ADDIE Model.

![Fig 3 Designing Basic SQL E-Learning using ADDIE model]
Figure 3 shows all the phases involved in designing Basic SQL E-Learning. There are five phases involved, which are:

a) Analysis phase: The Analysis phase is the foundation of instructional design. This phase is a process of defining what is to be learnt in SQL, include specific research such as determine requirements’ needs, problem statements, task involved and instructional goal.

b) Design phase: The design phase involved process of specifying that include writing a target population, objectives, description, conducting learning analysis, sequencing the instruction and identifying the resources.

c) Development phase: The development phase is the process of authoring and producing the materials. During this phase, application developed with the help of android studio software and supporting document such as framework, flowchart and design flow. This may include the entire software and hardware requirement to build Basic SQL E-Learning.

d) Implementation phase: The implementation phase is the process of installing the application in the real world context and check with a user.

e) Evaluation phase: The evaluation phase is the process of determining the adequacy of the application; interpret the result with a user by using user acceptance test the lot’s disposition based on counting the number of defectives in a sample picked from a lot randomly.

3.2 Framework for the development of Basic SQL E – Learning.

![Framework of development Basic SQL E – Learning](image-url)
4.0 FINDINGS

The application of Basic SQL E-Learning is tested using Android smartphone version 8.

Authentication phase as in Figure 5, user needs to login before entering the application. The new user needs to register before using this application.

Figure 6 shows the main menu of Basic SQL E-Learning. There are five functions provided in this application such as view notes, lab exercise, quiz and test. User can choose any menu and check the result through leader board at the end of the exercises.
Figure 7 shows the Data Definition Language menus, which provide notes of DDL and exercise such as CREATE, ALTER, DROP and RENAME syntax.

Figure 8 shows the Data Manipulation Language menus, which provide notes of DML and exercise such as SELECT, INSERT, JOIN, UPDATE, DELETE and TRUNCATE syntax.
Figure 9 shows the example of quiz provided in Basic SQL E-Learning.

5.0 CONCLUSION

The Basic SQL E-Learning application will help students to improve their skills and understanding of SQL that included DDL and DML. By using this application, students can learn SQL anywhere and anytime at their own convenience. This environment allows students to engage and experience various learning context as well as to develop their own learning style. As such, the new introduced environment of mobile application in teaching and learning for DEC40073 Database System course will benefit both educators and students in terms of face-to-face and none face-to-face learning process. In future, this application can be upgraded with music while answering the quiz and compatible with other platform.

REFERENCES


