Advance Personalized Learning: Software based approach

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Abstract— Every student has a different learning style to learn something. Advance Personalized Learning style is the learning style tailored to suit the learner only using technology. The education system in Malaysia has been following a one-size-fits-all method from primary to secondary school. The students are tested at the end of the year and major exam such as Ujian Penilaian Sekolah Rendah (UPSR), Penilaian Menengah Rendah (PMR) and Sijil Pelajaran Malaysia (SPM). Multiple Intelligence (MI) by Howard Gardner, is used as the approach for this personalized learning software based approach. A group of students from the faculty of Engineering will be chosen as subjects to be studied. The subjects will be tested whether do they have their own learning style and the proposed advance personalized learning skill will assist them in their studies. A quantitative analysis will be done on surveys and results of the data collected. The results of the survey and data acquitted from the software will illustrate the chosen model is successful in assisting students in their studies and deepen their interest in engineering.

Keywords— Personalized learning style, Industry, PHP, HTML, Multiple Intelligence

1. Introduction

Bloom’s taxonomy has been one of the main guidance to understand humans’ intelligent and a guidance to understand the learning process [1]. There are debates as researchers which found learning capability is linked to multiple intelligent (MI). It is a theory proposed by Howard Gardner [2]. There are certain subjects that are important to the industry but difficult for the student to learn such as Fluid Mechanics, Thermodynamics and Solid Mechanics. The objectives of this research project including; identifying the learning profile of the chosen group of mechanical engineering students in Taylor’s University, finding out the subjects / topics which are required by the industries but the subject is a challenge for the students, develop an advance personalized learning style; a software approach solely based on Multiple Intelligence theory, conducting the experiment the effectiveness of the advance personalized learning style and finally comparing and analyze of the effectiveness of the approach.

2. Research Methodology

The research of this final year project is an on-going process. It will be divided into four stages. The first stage is to perform research on case studies and journals to understand more about personalized learning, the work done regarding engineering education. This is important as case studies and journal will show the insights of the final year project and can be used as reference. The second stage is research on proper survey method. Survey is mainly divided into two types which are quantitative and qualitative survey. The chosen type of survey is vital as it will assist the analysis of the data. The third stage of research is to understand more about Multiple Intelligence (MI) and the method of profiling. The last stage will be conducting research on web based application or normal application as this is a software based approach advance personalized learning.

The survey is also divided into three parts and the three surveys must be done one after another. The first part of the survey is to identify the first part of survey that will be carried out is to identify the subjects that the industries feel important but difficult for students. The acquired subject will broaden the topics of students having difficulties and thus it will be easier to carry out the last survey. The second survey will be the topics that students feel bored or not interesting and difficult to understand. The topic that students chosen will be selected as the topic that program will assist the students in to help them understand the topic and develop their interest in it. The last survey that will be carried out is for the students to choose which software based approach they will prefer such as mobile apps, computer software or web based software.

The approach in this research project is profile the students and understanding their learning method and skill. Thus, program must have the selection of suitable survey questions to profile the students. After that, the students are required to use the program to assist them to understand the topic. At the end of the program, exercises will be used to test the students understanding on that specified topic. A survey will be available to survey whether the student has increased their understanding and interest in the topic and whether the program helps. Simultaneously, their test and final exam results will be collected to be analyzed in order to check their performance.

Pareto Analysis will be done on the survey stage of the research methodology. This is to identify the subject and topic that will be programmed to assist the students. Quantitative studies will be done instead of qualitative as quantitative can represent a group and higher number of people. Results of the students whether improved will be collected from the test and their final exam. The exercises available in the software will be collected to check their understanding on the subject manner. ANOVA analysis will be lastly to be done to demonstrate the percentage of improvement from the students.

5. Results and Discussion

After several case studies, Multiple Intelligence (MI) was chosen as the approach after comparing with Myers-Briggs Type Indicator (MBTI) and Kolb’s Experiential Learning Model [4]. MBTI was not chosen as the model does provide sufficient evidence whether difference in gender is one of the factor affecting the academic studies and interest of the learner [3]. The model only suggested that the learner ability affected by the student’s personality. It also does not suggest that there are other factors affecting the learning profile of a student such as the environment or intelligence. Kolb’s model only suggested that students of the four classifications only affect their studying ability [3]. MI classifies students according
to the intelligence or talent they have such as musical, linguistic, logical, visual, bodily, interpersonal, intrapersonal, naturalist and existential.

After research regarding the software type; web based application or normal application, web-based is selected as the software. The selection was done as web-based application allows the students to access it easily as long as they are connected to internet. It also allows the data to be easily collected as the student’s log and performance can be recorded in a selected server. Apache Xampp will be the selected server as the storage of the database. It is a free server. The usage of xampp allows the building of the database. From there, all data can be retrieved and populate it to the web system.

PHP and HTML will be chosen as the language for the web programming instead of C++ and JAVA. Java is a strongly-typed language. It requires explicit statements of intent to function and that it is backed by a compiler. Java contains lots of strict restriction on the inputs and outputs expression. If these exact expressions are not expressed correctly, the compiler will fail and the program is unable to function until errors are resolved. There are certain drivers and jar files like jdbc has to be used. The database for Java requires certain driver and jar file.

PHP is weakly typed language. It is more flexible as it requires less formal knowledge on programming. It only uses phpmyadmin as the database. The first advantage of PHP is, aside from being free in terms of cost. The open-source language is widely accessible on every Web-hosting platform for public usage. PHP works universally across platforms. The justification for this manner is that the code is processed entirely on the server side and can be delivered as dynamic content to the viewer. PHP can be also used for large scale operations.

7. Conclusions

Advance Personalized Learning will definitely able to encourage the engineering students to be interested in subjects and topics that they find difficult to understand or learn. This is important as the needs to produce capable engineers graduate to ensure the working industry able to meet the codes and standard. Multiple Intelligence theory will demonstrate the student’s performances. More improvement can be done after the analysis of the student is done. Web based application is the software approach as it provides flexibility on the student and the research.

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References