Learning Approach for Personalized Learning Environment (PLE): Preliminary Analysis

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Abstract

This paper reports the preliminary analysis findings that aimed to investigate student's learning styles that suitable for learning Form 2 Science subject using Personalized Learning Environment (PLE). An additional problem is that even learners from a similar learning context are not identical: they may be at different points of the learning process, or may have different learning styles. It will focus on the student perspective because they are so often ignored when it comes to the introduction of new technologies.With learners coming into schools, colleges and universities with increasingly smart technologies and schools and ministries of education, colleges and universities around the world beginning to add computer to the mix of technologies in schools. Learners expressed a desire for the integration of Science resources with their existing textbooks and online learning materials. It considers how they are using them and how this might differ from the suggested practice described in the literature and then considers what might be the implications for technology use in classrooms.
Keywords: computer, multimedia, science, PLE, technology

1. Introduction

There is also a serious concern on the reason why many students who do not score science subjects in secondary schools not to take science programmes and science related specializations in their higher learning [10]. Since the teachers' themselves are discouraged with the science learning environment there is no doubt that students will lack guidance and counselling on how to study and succeed in science subjects regardless of the challenges [10]. Furthermore, it seems that there is no improvisation in managing science teaching the situation which causes teachers to leave out difficult concepts [10]. Apart from that, teaching science subjects theoretically increase the chance for students to regard science as too difficult and hence less relevance to students daily life as noted by Goodrum [10].Thomson and Fleming [15] note the same line of results on students attitudes towards science subjects which was influencing by the teaching and learning process as well as teacher-students interaction in schools. Goodrum [10] and Rennie [15] both of them emphasize that the decline of

students' interests in science subjects is contributed by the students 'perceptions that, there is little relevance of science courses with their daily life.

The subject chosen in this study is Science Form 2. The Integrated Curriculum for Secondary Schools Specifications Science Form 2 is based on Ministry of Educations Malaysia. This project will propose new learning approach which is Personalized Learning Environment (PLE). Rather than the instructor, facilities, resources and tools PLE is more focused on individual learning. The effectiveness of learning can be improved through PLE where it plays active role [8]. In a network of people, services and resources PLE is one of the tools for a learner to be engaged in a distributed environment [13].

2. Literature Review

In 21st century, personal learning educational approach really through flexibility and choice, respect, recognizing the unique gifts, skills, passions and qualities for children as a challenges and obstacles [7].PLE has also played an active role in improving the effectiveness of learning. Indeed, traditional learning based on "one size fits all" approach, tends to support only one educational model, because in a typical classroom situation, a teacher often has to deal with several students at the same time [4]. Many researchers [2;7;10;11;16;17] suggested that the differences and distinctiveness of each learners must be taken in preparing the learning procedures to make sure learners are engaged and take responsibility for their own learning. Besides that, learners always has control what they learn but learner may not have control over what is taught. Learning experience becomes one of the core issues in the personalization [5]. We use Google, peers communication, online communities, problem solving and share learning resources [5]. A lot of academic learning happens beyond the formal educational systems. PLE represents a paradigm shift [6]; an idea of learning that easy-to-use environment based on continuous and ongoing process that provided by number of resources and individuals. The tool is very important in order to support individual learner which takes place in many contexts and situations [1].

The differences of learners include their learning styles, orientations, learning rates, cognitive styles, multiple intelligence, talents and many more [13]. Figure 1 show three of the most important types which are Auditory, Visual and Kinesthetic.
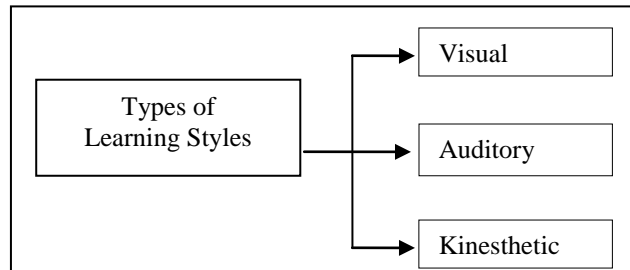
Fig.1: Focus area types of learning styles in PLE

There are three types of learning styles that applied in this study which is 1) Auditory, 2) Visual and 3) Kinesthetic.

i.   **Visual:** Students prefer using pictures, images, and spatial understanding. Learn by seeing. Frequently review notes, listen and take notes. They can hear well and sit in the lecture hall or classroom. After read something, summarize and recite it loudly.

ii.   **Auditory:** Students prefer using sound and music. Learn by hearing. Frequently write everything and review visual quickly. They practice by visualization or picturing words/concepts in head. They also use flashcards, notes filmstrips, maps and charts,

iii.   **Kinesthetic:** Students prefer using your body, hands and sense of touch. Learn by feeling or experiencing. Write several times for the facts that must be learned. Scratch paper is kept. Important thing is taking and taking and keeping lecture notes. Make study sheets.

To contribute to the successful of implementation on PLE are adopting applications, matching learning activities and integrating technologies in instruction. Thus, learning environment should be according to students learning styles, preferences and needs.

3.   Methodology

The methodology used to develop a courseware is ADDIE (Analyze, Design, Develop, Implement and Evaluate) model. ADDIE is a systematic or step by step model used for product development. Each phase to ensure development efforts stay on track, time and target. Figure 2 shows the ADDIE model adopted from http://www.cmcltd.com/sbu/cet_elearning.html.
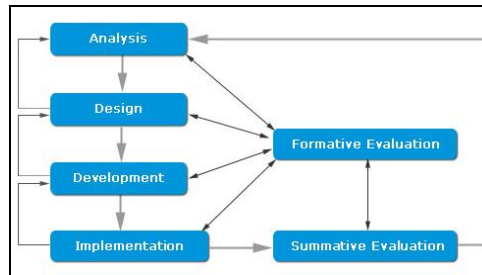
Fig. 2: ADDIE Model

3.1 Analysis phase

During analysis phase, the identification of student's problem in learning Science subject is defined. After that, goals and objectives are established and the PLE environment and methodology were identified so that student's requirements for assessment will achieve through this model. Focused group interviews, literature survey and survey will be conducted to verify requirement.

3.2 Design phase

Design a prototype based on the model proposed and concerned with the learning approach. Based on expected outcomes, produced from the above analysis, the interactive prototype can be designed by selecting content, media and type of interactivity that best underpins the objectives.

3.3 Development phase

The develop stage integrates PLE modules. At this point developing process initiates based on the storyboard created and concluded in an Alpha version of the product. By using the storyboard as guide, the development will start with interface development followed by the content. Each module will be built and ensure each button and function is working properly.

3.4 Implementation phase

This phase is to make sure the prototype is functional. All the modules and elements will be integrated to produce a final product that is ready to use. Demo application with a small group is very important to get the feedback that can be used to revise and improve the software.

3.5 Evaluation phase

This phase is the activities that require improvement for increasing the research result. Evaluation process is collecting feedbacks from end users. The questionnaire from the testers will be used for collecting feedback from the users of the software regarding the interface, PLE methodology, and its content.

4.   Preliminary Analysis

Questionnaires are distributed to 90 students in Form 2 students at SMK Malim, Melaka, Malaysia to find the most difficult topic in Science Form 2 subject.

Table 1 shows the findings of preliminary analysis to find the difficult topic in Science Form 2 subject. Researcher conducts an interview with Science Form 2 teachers to find the most difficult topic. Nutrition is most difficult and also having many subtopics. The subtopics of Nutrition are Classes of Food, The Importance of a Balance Diet, Human Digestive System, Absorption of Digested Food, Reabsorption of Water and Defecation and Healthy Eating Habits.

Table 1: Preliminary analysis findings to find difficult topic in Science Form 2

	N	Min	Max	Mean	Std. Deviation	Variance
Topic1	90	1	5	2.00	.835	.697
Topic2	90	1	5	3.99	1.117	1.247
Topic3	90	1	4	2.94	.904	.817
Topic4	90	1	5	2.84	.911	.829
Topic5	90	1	5	2.54	.901	.813
Topic6	90	1	5	2.72	1.006	1.012
Topic7	90	1	5	3.11	1.054	1.111
Topic8	90	1	5	3.02	.861	.741
Topic9	90	1	5	2.67	.960	.921
Topic10	90	1	5	2.09	1.098	1.205
N	90					

The data from the questionnaire are analyzed by using Statistical Package for the Social Science (SPSS). Few students have interviewed for the feedback regarding to the Nutrition topic. According to the feedback received, they have to remember the facts that had been taught in this topic. They also were boring with this topic. This boredom became more serious as students have not exposed on how improve the learning processes in this topic. Table 2 shows the frequencies for Topic 2 which is Nutrition in Science subject. 40% agree and 38.9% strongly agree that Nutrition is the hardest topic compared to other topics. Only 3.3% states that Nutrition is the easiest topic followed by easy which is 12.2%.

Table 2: Frequencies for Topic 2 Nutrition

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Easiest	3	3.3	3.3	3.3
Easy	11	12.2	12.2	15.6
Middle	5	5.6	5.6	21.1
Hard	36	40.0	40.0	61.1
Hardest	35	38.9	38.9	100.0
Total	90	100.0	100.0	

Table 3 shows the analysis of the students need internet for their study. Based on the statistic, it shows that 40% strongly agree and 38.9% agree that students need

internet for their study. Only 2.2% not agree and 1.1% strongly not agrees of using internet in their study. They also extremely value, useful tools which help them to plan their tasks, save time, simplify complicated tasks and definitively, have fun.

Table 3: Students Need Internet for Their Study

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	36	40.0	40.0	40.0
Agree	35	38.9	38.9	78.9
Middle	16	17.8	17.8	96.7
Not Agree	2	2.2	2.2	98.9
Strongly Not Agree	1	1.1	1.1	100.0
Total	90	100.0	100.0	

This research will provide a model to identify and assess student's preferences dominant learning styles which are Visual, Auditory and Kinesthetic and it will be used to develop the system. The behavior and performance of the students will be measured. A framework and model will be develop and generated focusing on the cognitive skills towards PLE.

5. Expected Results

This research will provide a new model and prototype for Form 2 Science students based on learning styles using PLE approach. Hence, the student performance in Science subject will increase. It also can be proposed a new model for Science subject for Form 2 students based on learning styles preferences.

6. Conclusions

Preliminary analysis findings from this study seem to suggest that, perhaps not surprisingly, computers are being used in schools in similar ways to the other implementations of technology in the classroom. If we consider the possibilities for the use of PLE that are discussed in the literature, we need to work more on making sure that teachers receive effective training to understand what the potentials are of such technologies and the powers that be need to make sure that access to the Internet makes this kind of activity possible.

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