Personalized Learning Environment (PLE): Need Analysis in Malaysian's Secondary School

Che Ku Nuraini Che Ku Mohd
Department of Interactive Media
Faculty of Information and Communication Technology,
University of Technical Malaysia Melaka,
Hang Tuah Jaya, 76100 Durian Tunggal,
Melaka, Malaysia.
Email: cknuraini@gmail.com

Faaizah Shahbodin
Department of Interactive Media
Faculty of Information and Communication Technology,
University of Technical Malaysia Melaka,
Hang Tuah Jaya, 76100 Durian Tunggal,
Melaka, Malaysia.
Email: faaizah@utem.edu.my

Abstract— **Recent years have witnessed how education has rapidly evolved into integration of technology or computer in the process of teaching and learning. As computer potentially enhances the process, this paper reports on the user need analysis on Science subject in Malaysian secondary schools that focus on Personalized Learning Environment (PLE), methods and materials and why PLE is needed. Several surveys were developed to explore the learning needs and goals as well as to construct the vision of PLE organization. It also presents the preliminary findings of a research in progress and the needs of PLE among the students. This study adapted the ADDIE (Analyze, Design, Development, Implementation & Evaluation) model to closely monitor and involve with the learning phenomena in such an open online environment in which the researcher became a learner to participate in various activities of the courses, to interact with participants and to explore the process of learning and interaction. In the development and adaption of such environment, it is essentially vital that students' opinion and viewpoints are taken into consideration. The paper also highlights the importance of engaging the users with PLE.**

Keywords: Methodology; Need Analysis; Nutrition; PLE; Science

I. INTRODUCTION

The idea of "personalizing" education is not new but it certainly has not been widely researched or accepted, especially in higher education [4]. The term personal learning environment (PLE) describes the tools, communities, and services that constitute the individual educational platforms learners use to direct their own learning and pursue educational goals. Personalized Learning has recently come to the forefront of discussions as a potential instructional strategy to increase motivation and ultimately student success in the online environment, yet little research exists to confirm the effectiveness of personalized learning in an online environment and its impact on motivation and student success [8]. Besides this, it is also expected from the 21st century teachers to collaborate with all sectors of the educational community in planning, managing, implementing, and evaluating programs [11][12]. It promises to learner an important result of learning and the quest for independent learning that incorporates largest collection of tools under the control of an individual [14][9]. As instructors and instructional designers move towards personalized learning with hopes of increasing learner motivation and ultimately learner achievement, research on best practices focusing technology to successfully accomplish this must be explored because in its current state, the research on these areas is limited [2].

PLEs are designed to propose a student-controlled space for the establishment of a model of learning that goes beyond curriculum and characterizes by the convergence of lifelong, informal, and ecological learning [5]. Their functions are based on social software tools and services which allow students to interact and share content and knowledge with other peers and professionals. One tendency in PLE development is the integration of widgets for improvement of their dynamics and interactivity [3][10]. 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 [1]. By choice and demand, technology is restructuring education, teaching, and learning, and affects them in ways that impact on everyone [7]. While most discussions of PLEs focus on online environments, the term encompasses the entire set of resources that a learner uses to answer questions, provide context, and illustrate processes. In an analysis of several PLEs, Wilson [14] detected a variety of tools and services: chat and messaging tools, groupware and community tools, calendaring, scheduling and time management tools, news aggregation tools, blogging and personal publishing tools, social software, authoring and collaboration tools, as well as Integration tools.

II. MATERIALS AND METHODS

The subject chosen in this study was Science Form 2. The aims of the science curriculum for secondary school are to

provide students with the knowledge and skills in science and technology and to enable them to solve problems and make decisions in everyday life based on scientific attitudes and nobles values. The Integrated Curriculum for Secondary Schools Specifications Science Form 2 is based on the Ministry of Education Malaysia. According to the syllabus, in overall, there are ten chapters to be completely covered in a whole year. The chapters include The World Through Our Senses, Nutrition, Biodiversity, Interdependence Among Living Organism And The Environment and Water And Solution. Other chapters are also presented such as Pressure, Dynamics, Support And Movement, Stability and Simple Machine.

A. Interview

The respondents, being the Science Form 2 teachers and students, were randomly selected for a face-to-face interview to determine the most difficult topic. Based on the interview, Nutrition topic was found to be the most difficult chapter and the chapter contains 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.

B. Analysis of PMR Results (Science Subject)

Table 1 shows the performance analysis of subjects and grade point average (GPA) Science subject for 2010 and 2011. Performance result for Science subject who scored grade "A" showed about 4.0 percent increase from 21.7 percent in 2010 to 25.7 percent in 2011. However, percentage of the candidates who do not pass a minimum rose from 0.6 percent to 5.7 percent in 2010 compared to 6.3 percent in 2011. GPA for Science subject showed an increment by 0.09 of a point drop.

TABLE I. PERFORMANCE ANALYSIS AND GRADE POINT AVERAGE IN PMR SCIENCE SUBJECT FOR YEAR 2010 AND 2011

Year	% Candidates						Number of candidates	Grade Point Average (GPA)
	A	B	C	D	ABCD	E		
2010	21.7	17.8	19.1	35.7	94.3	5.7	438,829	2.86
2011	25.7	17.0	18.6	32.4	93.7	6.3	440,447	2.77
Difference	4.0	-0.8	-0.5	-3.3	-0.6	0.6	1,618	-0.09

(Source: Kementerian Pelajaran Malaysia, 2012)

There is also a serious concern on the reason why many students who do not score Science subject in secondary schools not to enroll into the science stream and science related specializations in their higher learning [6]. Furthermore, it seems that there is no improvisation made in managing science teaching hence causes the teachers to omit difficult concepts. The teaching process and the teacher's effectiveness in teaching are, therefore, expected to be emphasized so as to overcome the challenges in science learning at school level. Thomson [13] noted the same line of results on the student's attitudes towards Science subjects which was influenced by the teaching and learning process as well as teacher-students interaction in schools.

C. Questionnaire

A set of questionnaire was initially distributed to 90 students of Form 2 students at SMK Malim, Melaka, Malaysia. Few students were interviewed for the feedback regarding the Nutrition topic. The data collected were then transferred and further analyzed by using *Statistical Package for the Social Science* (SPSS) version 17.0. According to the feedback, they have to memorize the facts that have been taught in this topic. The topic was also to be found as boring among the students. This boredom then grew more seriously as the students were not exposed on how to improve the learning processes in this topic.

TABLE II. 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 2 shows the frequencies for Topic 2 which is Nutrition in Science subject. 40 percent "agree" and 38.9 percent "strongly agree" that Nutrition is the hardest topic in comparison with other topics. Only 3.3 percent of them found that Nutrition is the easiest topic followed by easy which is 12.2 percent.

TABLE III. 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
Disagree	2	2.2	2.2	98.9
Strongly Disagree	1	1.1	1.1	100.0
Total	90	100.0	100.0	

Table 3 shows the analysis of the student's need of the Internet for their study. Based on the analysis, it shows that 40 percent of the students "strongly agree" and 38.9 percent of them "agree" that they need the Internet for their study. Only 2.2 percent of them "disagree" whereas 1.1 percent "strongly disagree" of using the Internet for their study. Majority of the students associate learning with acquiring information via Internet access. They also extremely value useful tools that

help them plan their tasks effectively, save time, simplify complicated tasks and definitively, have fun.

III. WHY WE NEED PLE

Technology is the key to personalized learning. In addition, imaginative use of ICT should help engage more learners in the excitement of learning. By borrowing ideas from the world of interactive games, we can motivate even reluctant learners to practice complex skills and achieve much more than they would through traditional means. New technologies can attract new kinds of learners into lifelong learning. We want learners who want to:

- access, watch and work with visual information;
- obtain instant results from their searchers and requests;
- use a game-style interface;
- network with others and use ICT to communicate with them;
- use fashionable tools and technology;
- using tools and technology when and how they want to;
- skip from task to task, emulating their experience and their lifestyle.

IV. THE IMPORTANCE OF PLE

PLEs represent a shift away from the model in which students consume information through independent channels such as the library, a textbook, or an LMS, moving instead to a model where students draw connections from a growing matrix of resources that they select and organize. In this context, the PLE functions as an extension of the historical model of individual research. Because they emphasize relationships, PLEs can promote authentic learning by incorporating expert feedback into learning activities and resources. A PLE also puts students in charge of their own learning processes, challenging them to reflect on the tools and resources that help them learn best. By design, a PLE is created from self-direction, and therefore the responsibility for organization, learning and rests with the learner.

There is an emerging view that we need more tailored approaches for learners to take them to the next level and achieve excellence, addressing better disparities that see so many groups of learners, often the most vulnerable, fail to thrive and succeed in education. For learners it means being engaged not just with the content of what is being taught but being involved with the learning process, understanding what they to do to improve and taking responsibility for furthering their own progress.

V. CONCLUSION

Educators who want to encourage an approach to learning in which the students create PLEs might offer a site where students can store their personal reflections and digital content, return to it, share it, and repurpose it in other tools. It is indicated that research on best practices for using technology to successfully accomplish personalization must be explored and this study confirms this [2]. PLE construction process requires equal participation of both students and the teachers, hence, a teacher may not necessarily perform all the roles, but, rather, he/she interacts with the students in general. It is time now to re-visit our science teaching as a notion in order to attract many students in science education so as to prepare our own scientists for the development of the nation [6].

ACKNOWLEDGMENT

This research project would not have been possible without the support of many people. The author wishes to express her gratitude to her supervisor, Assoc. Prof. Dr Faaizah Shahbodin who was abundantly helpful and offered invaluable assistance, support and guidance. I would also like to convey thanks to the Universiti Teknikal Malaysia Melaka (UTeM), Melaka, Malaysia for providing the financial means and laboratory facilities. I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

REFERENCES

[1] Bachari E., El Hassan Abelwahed and Mohammed El Adnani. E-Learning Personalization Based On Dynamic Learners' Preference. International Journal of Computer Science & Information Technology (IJCSIT), Vol 3, No 3, June 2011.

[2] Davis, M. R. Researchers tackle personalized learning. Education Week, 30-38, 2011.

[3] D. Gillet, E. L-C. Law, and A. Chatterjee, Personal Learning Environments in a Global Higher Engineering Education Web 2.0 Realm, IEEE EDUCON Education Engineering 2010 Conference, Madrid, Spain. http://www.roleproject.eu/wp-content/uploads-role/2010/01/educon_dg_final_free.pdf. 14-16 April, 2009.

[4] Keefe, J. W., & Jenkins, J. M. Personalized Instruction: The Key to Student Achievement (2nd ed.). Lanham, MD: Rowman& Littlefield Education. 2008.

[5] M. A. Chatti, M. Jarke, and M. Specht, PLEF: A Conceptual Framework for Mashup Personal Learning Environments. Learning IEEE Technical Committee on Learning Technology (TCLT), 11:3, ISSN 1438-0625, http://www.ieeetclt.org/issues/july2009/index.html#_Toc239246014 July 2009.

[6] Mabula, N. Promoting Science Subjects Choices For Secondary School Students In Tanzania: Challenges And Opportunities. Academic Research International. ISSN-L: 2223-9553, ISSN: 2223-9944, Vol. 3, No. 3, November 2012.

[7] Minocha, S., Schroeder, A. and Schneider, C. Role of the educator in social software initiatives in further and higher education: A conceptualisation and research agenda. British Journal of Educational Technology, 42: no. doi: 10.1111/j.1467-8535.2010.01131. 2011.

[8] Pemberton, A. The Impact of Personalized Learning on Motivation and Student Success in Online Learning. Proceedings of Society

for Information Technology Teacher Education International Conference 2013.Issue: 2009, Publisher: AACE, Pages: 907-914. 2013.

[9] Peña-López, I. Personal Learning Environments: blurring the edges of formal and informal learning,Working Paper.2010.

[10] R. Godwin-Jones, Emerging Technologies Personal Learning Environments, Language Learning & Technology Journal, 13:2, pp. 3-9, ISSN 1094-3501, http://llt.msu.edu/vol13num2/emerging.pdf. June, 2009.

[11] Shaikh, Z. A. and Khoja, S. A. Role of ICT in shaping the future of Pakistani higher education system,Turkish Online Journal of Educational Technology, vol. 10(1), 149 – 161. 2011.

[12] Selvi, K. Teachers' competencies, Cultura. International Journal of Philosophy of Culture and Axiology,vol. 7(1), 167-175. 2010.

[13] Thomson, S. Examining the Evidence: Science Achievement in Australia Schools. Retrieved from http://research.acer.edu.au/aer/3. 2006.

[14] Wilson, S. Patterns of Personal Learning Environments, Interactive Learning Environments, 16(1), 17-34, doi: 10.1080/10494820701772660. 2008.