UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PRACTICAL LEARNING STYLES APPROACH ON PERSONALISED LEARNING ENVIRONMENT (PLE)

CHE KU NURAINI BINTI CHE KU MOHD

DOCTOR OF PHILOSOPHY

2016

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Faculty Information and Communication Technology

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CHE KU NURAINI BINTI CHE KU MOHD

A thesis submitted
in fulfillment of the requirements for the degree of Doctor of Philosophy
Faculty of Information and Communication Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2016

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DECLARATION

I declare that this thesis entitled "Practical Learning Styles Approach on Personalised Learning Environment (PLE)" is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : ……..

Name : Che Ku Nuraini Binti Che Ku Mohd

Date : ……..……

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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in term of scope and quality for the award of Doctor of Philosophy.

Signature	:	……..
Supervisor Name	:	Prof. Dr. Faaizah Shahbodin
Date	:	……..……

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DEDICATION

Dear Parents,
Hj. Che Ku Mohd bin Che Ku Ngah & Hjh. Wan Hasimah binti Wan Ahmad
Without both of you none of my success would be possible

Dear Beloved Husband,
Norhalis bin Abdul Ghafar
For making me be who I am, your support, encouragement and constant love have sustained me throughout my life

Dear Parents in Law,
For supporting me all the way

Dear Siblings,
Who have been supported me all the way since the beginning of my PhD journey

Dear Supervisors,
Prof Dr. Faaizah binti Shahbodin and co-supervisor Dr. Ahmad Naim bin Che Pee @ Che Hanapi for being there for me throughout the entire doctorate program.
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ABSTRACT

Personalised Learning Environment (PLE) is one of the learning approaches that help learners take control of and manage their own learning towards flexible and adaptive in responding to the diverse needs and interests of students. However, there are limited research conducted that integrates learning styles with PLE approach using prototype to increase student performance. Learning styles are important components in a learning environment. Learning styles are among the concepts that are postulated by to show learners' differences and varied needs. The issues in this study highlight students' lack of interest in learning Science and also fail to classify, synthesise and evaluate information. There are three objectives which are (i) To propose a learning model that integrate dominant learning styles and PLE elements; (ii) To design a learning prototype based on the proposed model that integrates dominant learning styles in Personalised Learning Environment (PLE) and (iii) To evaluate the effectiveness of the prototype towards student performance and student perception. Science is a compulsory subject for Form 2 students from Ministry of Education Malaysia. A prototype called PLENut was developed. The research framework consist of three phases which are (i) Phase 1 PLENut Analysis, (ii) Phase 2: PLENut Design, Development & Implementation and (iii) Phase 3: PLENut Evaluation. Testing was conducted to analyze independent variables by Visual, Auditory and Kinesthetic types of learning styles while student's performances and student perception are dependent variable. The data was populated from 132 Form Two students of Sekolah Menengah Kebangsaan Dato' Dol Said, Alor Gajah, Melaka, Malaysia. The population was divided into 3 groups which is (i) Visual (n=76); (ii) Auditory (n=35) and (iii) Kinesthetic (n=21). The separate sample pretest and posttest design was implemented to assess the effectiveness of the PLENut in increasing students' performance. Non parametric tests which are Wilcoxon Signed Ranked Test and Kruskal Wallis Test were used to analyze the data. The result revealed that: (i) there were no statistically significant differences in mean ranks between group 1, group 2 and group 3 for Visual, Auditory and Kinaesthetic learning styles in terms of student performance and (ii) there were two specific learning styles that were statistically different from each other, which is between Kinesthetic-Visual (test statistic=60.650, p-value=0.000) and Auditory-Visual (test statistic=45.440, p-value=0.000). Therefore, the study found that there is a significant relationship between student performance and learning styles. Results of student performances showed that Science subject is significant with Visual, Auditory and Kinaesthetic learning styles. As a conclusion, PLENut has demonstrated a practical learning styles approach on Personalised Learning Environment (PLE) in teaching and learning of Science subject.

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ABSTRAK

Persekitaran Pembelajaran Peribadi (PLE) adalah salah satu pendekatan pembelajaran yang membantu pelajar mengawal dan menguruskan pembelajaran mereka sendiri supaya lebih fleksibel dan dapat beradaptasi dalam bertindak balas kepada pelbagai keperluan dan kepentingan pelajar. Walau bagaimanapun, terdapat penyelidikan terhad dijalankan dalam mengintegrasikan gaya pembelajaran dengan pendekatan PLE menggunakan prototaip untuk meningkatkan prestasi pelajar. Gaya pembelajaran merupakan komponen penting dalam persekitaran pembelajaran. Gaya pembelajaran adalah antara konsep yang didalilkan untuk menunjukkan perbezaan dan keperluan pelajar.Terdapat pelbagai isu yang diketengahkan seperti pelajar kurang minat dalam pembelajaran Sains dan juga gagal untuk mengklasifikasikan, mensintesis dan menilai maklumat.Pertama, kajian ini menyumbang kepada pembangunan model peribadi Persekitaran Pembelajaran Pemakanan atau PLENut. Kedua, ia adalah untuk menilai keberkesanan berdasarkan prestasi pelajar untuk tiga jenis gaya pembelajaran yang dominan iaitu (i) Visual, (ii) Auditori dan (iii) Kinestetik. Subjek Sains merupakan subjek wajib bagi Tingkatan 2 yang meliputi topik Pemakanan daripada Kementerian Pelajaran Malaysia. Satu prototaip dipanggil PLENut telah dibangunkan. Rangka kerja kajian terdiri daripada tiga fasa iaitu (i) Fasa 1 Analisis PLENut, (ii) Fasa 2: Rekabentuk, Pembangunan & Pelaksanaan PLENut dan (iii) Fasa 3: Penilaian PLENut.Ujian telah dijalankan untuk menganalisis pembolehubah bebas gaya pembelajaran iaitu Visual, Auditori dan Kinestetik. Manakala pencapaian pelajar adalah pembolehubah bersandar. Responden seramai 132 pelajar Tingkatan 2 adalah dari Sekolah Menengah Kebangsaan Dato' Dol Said, Alor Gajah, Melaka, Malaysia. Rekabentuk sampel ujian pra dan pasca secara berasingan telah dilaksanakan. Populasi respondan dibahagikan kepada 3 kumpulan iaitu Visual (n = 76), Auditori (n = 35) dan Kinestetik (n = 21). Ujian pra sampel berasingan dan reka bentuk ujian pos dilaksanakan untuk menilai keberkesanan PLENut dalam meningkatkan pencapaian pelajar.Hasil kajian ini menunjukkan bahawa dari segi pencapaian pelajar, tidak terdapat perbezaan yang signifikan secara statistik dalam kedudukan min di antara kumpulan 1, kumpulan 2 dan kumpulan 3 terhadap gaya pembelajaran Visual, Auditori dan Kinestetik. Keputusan juga menunjukkan terdapat dua gaya pembelajaran tertentu yang tidak statik, iaitu Kinestetik-Visual (ujian statistik = 60.650, nilai p = 0.000) dan Auditori-Visual (ujian statistik = 45.440, nilai p = 0.000). Oleh itu, kajian ini mendapati bahawa terdapat hubungan yang signifikan antara pencapaian pelajar dan gaya pembelajaran. Keputusan pencapaian pelajar menunjukkan bahawa subjek Sains adalah signifikan dengan gaya pembelajaran Visual, Auditori dan Kinestetik. Kesimpulannya, PLENut telah mempamerkan pendekatan yang praktikal untuk mengintegrasi gaya pembelajaran dalam Persekitaran Pembelajaran Peribadi (PLE) untuk pengajaran dan pembelajaran bagi subjek Sains.

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LIST OF ABBREVIATIONS

ADDIE	Analysis, Design, Development, Implementation & Evaluation
AS	Action Script
CRIM	Centre Research & Innovation Management
FTMK	Fakulti Teknologi Maklumat & Komunikasi
FICT	Faculty of Information and Communication Technology
ID	Instructional Design
IT	Information Technology
ICT	Information & Communication Technology
KPM	Kementerian Pelajaran Malaysia
LS	Learning Style
LMS	Learning Management System
MOE	Ministry of Education
MOHE	Ministry of Higher Education
PLE	Personalised Learning Environment
PLENut	Personalised Learning Environment for Nutrition
SPSS	Statistical Package for Social Science
URL	Uniform Resource Locator
UTeM	Universiti Teknikal Malaysia Melaka

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