Faculty of Information and Communication Technology

DEVELOPMENT OF FRAMEWORK TO ENGAGE STUDENT'S LEARNING IN TECHNICAL MOOC USING WEARABLE TECHNOLOGY

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Doctor of Philosophy

2019

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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

2019

DECLARATION

I declare that this thesis entitled “Development of Framework to Engage Student’s Learning in Technical MOOC Using Wearable Technology” 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 : SITI FEIRUSZ BINTI AHMAD FESOL

Date : ……..……

APPROVAL

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

Signature	:	……..
Supervisor Name	:	PROF. TS. DR. SAZILAH BINTI SALAM
Date	:	……..……

DEDICATION

Dear God
I devoted my life and death to You. May my life be within your guidance.

Dear Mum and Dad
Thank you for your sacrifice, prayer and endless love. There is no retaliation except God.

Dear beloved Husband and Children
Thank you for your continuous love, support, patience and encouragement that give me the strength to finish this study. May God bless us, guide us and protect us to be a good person.

Dear Supervisors
Thank you for all the knowledge and guidance throughout this journey. May God blessed you all.

Dear Siblings
Thank you for your motivation and love.

Dear Friends
Thank you for all the knowledge, guide and encouragement and love. May our friendship last forever and blessed by God.

ABSTRACT

The low completion rate issue in MOOC has become one of the main highlights by researchers. It is reported that only 10 to 15 per cent of the students able to complete the MOOC. This low completion rate was due to the students are less engaged with the MOOC content causing them to demotivate to complete the whole MOOC. Engaging students in a MOOC environment especially for non-technical subjects was achievable. However, for a technical MOOC it involved significant challenges. Researches highlighted that one of the requirements for designing an engaging practice-based MOOC or technical MOOC is to include practice-oriented learning mode into its course structure. Therefore, the aim of this study is to develop a framework to engage student's learning in technical MOOC using wearable technology. This study adopted the case study methodology approach with qualitative and quantitative analysis which conducted at UTeM. The instruments used in this study include technical MOOC, wearable technology, and student engagement items. A total of 375 engineering students involved in this study and the data were analysed using descriptive and parametric testing. The survey results reflected that the learning materials produced by wearable technology do contribute towards positive effect in increasing the level of student's engagement with the learning process. Among key recommendations for future study are to implement the proposed framework to design and develop other engineering and technical courses and to further explore other potential elements of wearable technology to enhance student engagement in online learning.

ABSTRAK

Isu kadar penyelesaian yang rendah di MOOC telah menjadi salah satu penonjolan utama oleh penyelidik. Dilaporkan bahawa hanya 10 hingga 15 peratus pelajar dapat melengkapkan MOOC. Kadar penyelesaian yang rendah ini disebabkan oleh pelajar kurang terlibat dengan kandungan MOOC yang menyebabkan mereka kurang bermotivasi untuk menyelesaikan keseluruhan MOOC. Melibatkan pelajar dalam persekitaran MOOC terutama untuk subjek bukan teknikal adalah sangat sesuai. Walau bagaimanapun, untuk MOOC teknikal ia melibatkan cabaran yang ketara. Penyelidikan menekankan bahawa salah satu keperluan untuk merekabentuk MOOC berasaskan praktik yang berpangkalan atau MOOC teknikal adalah untuk memasukkan mod pembelajaran berorientasikan latihan ke dalam struktur kursusnya. Oleh itu, matlamat kajian ini adalah untuk membangunkan rangka kerja untuk melibatkan pembelajaran pelajar dalam MOOC teknikal menggunakan teknologi boleh dipakai. Kajian ini menggunakan pendekatan metodologi kajian kes dengan analisis kualitatif dan kuantitatif yang dijalankan di UTeM. Instrumen yang digunakan dalam kajian ini termasuk MOOC teknikal, teknologi boleh dipakai dan penglibatan pelajar. Sejumlah 375 pelajar kejuruteraan yang terlibat dalam kajian ini dan data dianalisis menggunakan ujian deskriptif dan parametrik. Hasil kajian menunjukkan bahawa bahan pembelajaran yang dihasilkan oleh teknologi boleh dipakai menyumbang kepada kesan positif dalam meningkatkan tahap penglibatan pelajar dengan proses pembelajaran. Antara cadangan utama untuk kajian masa hadapan adalah untuk melaksanakan rangka kerja yang dicadangkan untuk merekabentuk dan membangunkan kursus kejuruteraan dan teknikal lain dan untuk meneroka lagi potensi lain teknologi boleh dipakai untuk meningkatkan penglibatan pelajar dalam pembelajaran atas talian.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my deepest gratitude and appreciation to my supervisors Professor Ts. Dr. Sazilah binti Salam and Professor Madya Dr. Norasiken binti Bakar for their valuable personal and professional guidance. Their wealth of knowledge, continuous advice, and encouragement has made my doctoral endeavour all possible.

I would also like to express my appreciation to Dr. Aliza binti Che Amran, Mrs. Intan Mastura binti Saadon, Mrs. Amalia Aida binti Abd Halim, Mrs. Emy Zairah binti Ahmad, and Mrs. Nurbahirah binti Nordin for their valuable advice and support throughout the prototype design, development and testing activities involved in this study.

I gratefully acknowledge the funding received towards my PhD from the Centre for Graduate Studies, UTeM under UTeM Zamalah Scheme.

I also acknowledge with deep sense of reverence, my gratitude towards my parents Mrs. Siti Noliah binti Osman and Mr. Ahmad Fesol bin Osman, my beloved husband Mr. Muhammad Hanif bin Abdul Azis, my children Hadi and Muhammad Hafy, and member of my family, who has always supported me morally as well as economically.

At last but not least gratitude goes to all my friends who directly and indirectly helped me to complete this study.

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AE	-	Affective engagement
AL	-	Active learning
AR	-	Augmented Reality ability
BE	-	Behavioural engagement
CE	-	Cognitive engagement
CI	-	Course information
CM	-	Communicating with large infrastructure
cMOOC	-	Connectivist Massive Open Online Course
CR	-	Course resources
DV	-	Dependent variables
FP	-	First-person view
IV	-	Independent variables
LI	-	Learning interaction
MC	-	Meaningful connection
ML	-	Monitoring of learning
MOOC	-	Massive Open Online Course
MTUN	-	Malaysian Technical University Network
MV	-	Moderating variables
N	-	Navigation
PEE	-	Principles of Electrical and Electronic
PL	-	personalize learning
pMOOC	-	Project-based Massive Open Online Course
PO	-	Program outcome
PR	-	Pattern recognition
RA	-	Recording ability
RT	-	Real-time interaction
SA	-	Student assessment

TVET	-	Technical and vocational education and training
UTeM	-	Universiti Teknikal Malaysia Melaka
VISIR	-	Virtual Instrument System in Reality
WT	-	Wearable technology
xMOOC	-	Content-based Massive Open Online Course