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		Version 12.0	Date : 19/01/2015

R&D01

PROJECT SPECIFICATION

1.0 BASIC INFORMATION
1.1 Project Title DARE: Augmented Reality Technologies for Immersive Learning Spaces (DARE)
1.2 Project Objective/Purpose (Please describes the measurable general and specific objectives of the project and defines the expected results. Use result-oriented wording with verbs such as to define, to determine, to identify, to investigate.....) <i>For research type of project:</i> please include research objective as the primary objective The main objective of this research is to develop a physical learning environment that is just as immersive, interactive and engaging as the online learning environment with the use of augmented reality technology. This futuristic and immersive smart learning space is called DARE which stands for Digital Augmented Reality Environments. The objectives of this project are: To design & develop a technology-enhanced physical learning environment. To design & develop learning materials that are augmented and placed throughout the physical learning environment.

2.0 PROJECT JUSTIFICATION
2.1 Problem Statement (Please state the problem which relate to this project) The Malaysian Ministry of Higher Education has called for educational institutions to enhance student learning experiences through the use of technology. This was highlighted as part of the “Malaysian Education Blueprint 2015-2025 for Higher Education” where the ministry has also called for all Higher Learning Institutions to use blended learning models as their pedagogical approach. In heeding this call, Multimedia University is now striving to reach “iUniversity” status by encouraging every faculty to start developing blended learning environments in their classrooms. Classes are now to be designed to incorporate the use of online technologies with traditional face-to-face class activities and follow a pedagogically sound method. Research on technology in education has been mainly focusing on the use of technology outside the physical classroom. However, in a blended learning environment, the face-to-face component is supposed to be given equal importance to the online component. Hence Universities are unsure of how to design the face-to-face component of a blended learning environment. Faculties are beginning to implement blended learning strategies in classroom, however it is still at the initial stages. The current focus is to create employable graduates with 21st century skills by using technology such as AR as an enabler. However there is a lack of studies on the effectiveness of AR content towards student learning.
2.2 Proposed Solution (based on problem statement, list out the solution/s that this project could offer or the product that could be derived from the project. Discuss and compare the solution/s available in the market with that produced by TMR&D) Therefore in this project we would like to revisit the physical learning environment and augment the environment through the use of augmented reality technology (AR), powered by high speed broadband (HSBB such as TM’s Unifi). In other words, we propose to enhance the classroom environment by combining sound pedagogies with immersive technology (AR). Therefore, the physical learning environment becomes just as immersive, interactive and engaging as the online learning environment. This futuristic and immersive learning space is called DARE; which is an acronym for Digital Augmented Reality Environments. We hope the



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findings from this project will allow future educators to build learning spaces that can seamlessly bridge the process of learning at home, learning in a virtual environment and learning in a physical environment.

2.3 Business Opportunity (Give a brief orientation on the business opportunity related to project outcome. If applicable, provide information on the market situation for the project outcome. This includes information on status of customer agreement, profitability calculation for the project outcome, technology trends, competitors and cooperative products and market window.)

The outcome of this research project hopes to bring about the following cost savings/revenue opportunities:

Engage students in MMU, possibly increasing student intake

Project may generate interest in the use of AR supported by High Speed Broadband (HSBB) within a classroom setting to enhance learning experiences

Possible future collaboration with TM AURA team to enhance AURA platform

3. PROJECT BENEFITS

3.1 Expertise development:

PhD degrees What field? _____ How many? _____

MSc Degrees What field? Multimedia and Education How many? 1

New specialization What field? _____ How many? _____

Others, please specify _____

3.2 Economic Contribution:

Sales of manufactured product/ device/ equipment

Royalties from licensing

Cost saving

Time saving

Others, please specify _____

3.3 Infrastructure contribution:

New equipment

New/ improved facilities

New information network

Others, please specify _____

3.4 Organisation's reputation:

Demand for advisory service

Invitations to present speeches on conferences

Awards and recognitions



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Others, pls. specify _____

3.5 Intellectual Property Right for End Product:

Patent

Integrated Layout Design

Copyright

Industrial Design



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4.0 PROJECT SCOPE

4.1 Project Type

- Basic Research
- Applied Research/ Technology Development
- Product/ Process Development

4.2 Project Period

August 2016 – July 2018

4.3 Key Milestones (Please list and describe the principal milestones of the project. The timing of milestones is to be shown in the Gantt Chart (Format: MS Project). A key milestone is reached when a significant phase in the project is concluded, e.g. completion of test, review, commissioning, etc. For project which is more than 2 years, the milestones for year 3, year 4, etc.... need to be listed)

MILESTONE	ACTIVITY	DELIVERABLE/ OUTPUT	COMPLETION DATE
M1	Design and Planning Phase	<ul style="list-style-type: none"> • Identify 3 project-based classes to be used • Design a framework/ structure for the physical learning space • Design of assets and markers for 3 classes • Design of AR content for 3 classes • Research & design measurement matrix 	January 2017
M2	Development Phase	<ul style="list-style-type: none"> • Building of the learning space • Development of assets and markers (3D modelling, 2D images/graphic assets) • Development of static content (Videos, images, etc) • Development of Interactive content (3D animation, programming interactions, etc) • Implementation of all assets, markers, and content into the physical learning space 	July 2017
M3	Testing/Evaluation Phase	<ul style="list-style-type: none"> • Alpha testing • Beta testing • Gamma testing 	July 2018
M4	Comments/Feedback and Reiterations	<ul style="list-style-type: none"> • Gathering of student feedback and comments • Redesign/redevelop content based on feedback • Map feedback/ comments to proposed matrix for measurement of effectiveness of AR in teaching and learning 	July 2018

4.4 Expected Outcome (Expected End Product)

Setting up of a smart “Augmented Reality” learning space

AR-enhanced content will be created and developed to augment the learning experience.

Framework for the effective use of AR content to student learning

4.5 Cost of the project

Labour	:	RM108,000
Material	:	RM7,500
Incidental	:	RM20,300
Equipment	:	RM54,620
MMU FAC	:	RM9,521
Project Cost	:	RM199,941
Project Value	:	RM229,932.15 (including 15% management fee)



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5.0 ASSIGNMENT TEAM & STAKEHOLDERS

5.1 Assignment Team:

Name	Designation	Task	% of Contribution
Ms. Heidi Tan Yeen-Ju	Multimedia University	Project Leader	20
Prof. Dr. Neo Mai	Multimedia University	Project Advisor	10
Prof. Dr. Neo Tse Kian	Multimedia University	Project Advisor	10
Dr. Hew Soon Hin	Multimedia University	Project Member	15
Ms. Syarifah Nurleyana Wafa Binti Syed Naquib Wafa	Multimedia University	Project Member	15
Mr. Mohd Nazri Zainuddin	Multimedia University	Project Member	15
Mr. Muhammad Syahmi Abd Aziz	Multimedia University	Project Member	15

5.2 Custodian/Potential Custodian:

Mr. Vasantha Mohan A L Vasudevan Aka Munisamy
VADS
Agreed for Custodianship

5.3 Partners/Collaborators:

5.4 Technical services provider (service/ competence/ products):

TM AURA



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Prepared by: Technical Leader	_____ (Signature & Date)
Reviewed by: Project Manager	_____ (Signature & Date)
Verified by: Theme Lead	_____ (Signature & Date)
Head of PMO / MMU (RMC)	_____ (Signature & Date)
Approved by: Head of Research Division	_____ (Signature & Date)