Pedagogy enabled through technology: using augmented reality effectively through mobile devices in the ICT learning environment

Munoz, Juan Carlos; Cowling, Michael A.; Birt, James R.

Link to output in Bond University research repository.

PEDAGOGY ENABLED THROUGH TECHNOLOGY: USING AUGMENTED REALITY EFFECTIVELY THROUGH MOBILE DEVICES IN THE ICT LEARNING ENVIRONMENT

JUAN C MUÑOZ, PHD STUDENT (IEEE MEMBERSHIP 93325907)
SUPERVISORS: DR MICHAEL A COWLING | PROF BRIJESH VERMA | DR JAMES BIRT

BACKGROUND

» New emerging devices and virtual environments offer exciting new opportunities for creating innovative learning communities for students.

» Interactive learning environments such as Augmented Reality (AR) are considered as a promising strategy for providing instructional content that allows the learner to engage actively in the learning process.

» Through virtual environments, learners can collaborate or work individually towards enhanced learning outcomes in a learning process activity (Wang et al. 2013).

» Giving permission to multitask using mobile computing devices in a controlled fashion could benefit students to improve learning outcomes, student performance, and motivation.

TECHNOLOGY/APPS

» AR-based Learning can run on standard mobile devices such as smartphones PC tablets, iPads, iPhones using a downloadable application.

RESEARCH METHODS

» Pre-assessment interview and discussion with students to determine level of knowledge and competence

» Evaluation of students level of knowledge and understanding using learning materials embedded with AR compared to students taught via a traditional approach.

» Validation of all learning activities involved for consistency and effectiveness

EXPECTED RESULTS

» Overall student learning and engagement improvement and success compared to students using non AR embedded learning materials

» Significant benefits in terms of pedagogical effectiveness and experiential and collaborative learning processes by using AR

PROBLEM

» The pedagogy of teaching computing presents particular challenges. For undergraduate students great effort must be taken to engage them in the learning process, it can be too easy to fall into a dead end with repetitive lectures.

OBJECTIVES

» Investigating the effectiveness of using augmented reality (AR) mobile devices in ICT classrooms as an enabler of interactive learning, empowering students to use AR applications to improve active learning by using embedded learning material.

» Providing a mechanism to encourage student engagement, learning interaction, participation and motivation towards learning performance

PROPOSED INTERVENTION

» System Analysis Tutorial exercises provided to students embedded with and without an augmented reality component

» Smartphone/Tablet application developed for augmented reality learning

» App assists students through their learning process using alive textbooks/tutorials - AR embedded learning materials.

» App helps students develop an appropriate and flexible learning approach adapted to the student learning styles and competency

REFERENCES

» Wang, Y, Vicenti, G, Braman, J & Dudley, A 2013, 'The ARICE Framework: Augmented Reality in Computing Education', International Journal of Emerging Technologies in Learning, vol. 8, iss. 6, pp. 27-34

RESEARCH in association with

CQUniversity AUSTRALIA

BOND UNIVERSITY