BU PhD STUDENTSHIPS 2017
PROJECT DESCRIPTION

PROJECT DETAILS

Project Title

Immersive worlds, AR & tools for learning innovation: an empirical investigation in the UK HE context

Project Summary

The proposed project seeks to elucidate the connections between immersive worlds, augmented reality and tools for learning innovation. Using a constructivist perspective, it aims first, to systematically appraise the literature on these three major themes; second, to operationalise learning innovation by developing a teaching and learning framework using augmented reality and other low-cost tools for scalable immersive experiences (e.g. Google cardboard); third, to evaluate the learning potential of this tool-mediated exercise.

The research has a strong rationale in view of the rapid evolution of virtual and augmented reality tools, which has not been accompanied by the systematic appraisal of its effectiveness for student-centred learning. Immersive virtual worlds such as Second-Life have been deployed in higher education for the last decade, with research indicating strong student engagement (e.g. Philips et al., 2015), but often relying on self-report for learning outcomes (Hew & Cheung, 2010). Augmented reality applications, in turn, are task-specific tools that link information to enlarged resources and tools, with wide applications in higher education but limited evaluation of learning outcomes (Martín-Gutiérrez et al., 2014; Munnerley et al., 2014). Hobbs and Holley (2015, 2016) have evaluated AR for STEM students, thus providing a base for the empirical work. The proposed project bridges the gaps of effective evaluation in these two domains by proposing and implementing original, academically underpinned empirical research exploring affordances and evaluation of these technologies for the student body, with a plan for scalability across contexts.

The research will include three publishable components with distinct but interrelated methods:

a) Systematic literature review. Protocol of the review to be registered to guarantee timeliness and be easily trackable by other researchers. Searches will be piloted, an expert panel will be appointed with authorities in these fields and systematic screening of references will be performed. Relevant outcomes will be identified by the PGR, as well as the direction of the review (narrative, realistic, meta-analytic).

b) Operationalization of the research gaps found in the literature review by developing a non-experimental teaching and learning exercise to be deployed in the higher education context (specific area to be chosen by PGR, with strong candidates being health sciences, engineering, media and psychology). Implementation of the exercise by comparing the intervention with a control (standard teaching methods) group.

c) To conduct process and outcome evaluation of the intervention exercise through a mixed methods design that should ideally include video-analysis of implementation sessions (non-verbal, implicit level), questionnaires for student engagement (individual level), and focus group discussions with students (group level), as well as objective measures such as attendance records, grades and responses to before and after surveys.

Each stage of the proposed project will lead to at least one distinct academic output, directly supporting the UoA25 REF submission with a minimum of three publications. It is expected that the completed systematic review will underpin the first-year review exercise for the PGR and thus generate a publication a year into the project. The other two publications will follow at the rate of one per year.

Academic Impact

The intersection between immersive worlds, augmented reality and tools for learning innovation is an underexplored area with relevance for the fields of higher education, engineering and media. The specific interdisciplinarity brought

about by this project positions it as ideal to generate high-impact publications.

The project is likely to have replicability implications in subjects other than the one used for intervention, thus propelling wider impact in the higher education sector. In light of this, the extensive networks of the First Supervisor, and the social media profile cultivated by the PGR (see training opportunities below), it is expected that the project will generate connections and knowledge exchange at an institutional and sector level.

Societal Impact

The proposed project will generate a new technological intervention and a model for evaluating it. This process can be adapted beyond the higher education context, especially due to the emphasis on using low-cost tools (e.g. Google cardboard). The systematic review will be shared widely through relevant networks. The intervention results, in turn, should impact on educational practices and methods in education in general, and a dissemination pathway with practitioners will be designed to this effect.

It is expected that the model generated by this project can be extended to improve the end user experience of augmented and virtual reality users beyond the classroom, with transferability to different learning contexts.

Training Opportunities

The PGR will work closely with three academics with a specialist research background in at least one of the different components of the project. They will provide close mentoring in systematic reviewing, technological tools use for learning and teaching, and empirical research design. This will be enhanced by the expectation that the candidate cultivates a strong social media profile during the project, for which s/he will be mentored.

CEL will procure training opportunities for the PGR, including systematic review masterclass, social media for academic purposes and methodological training.

CEL will provide specific outlets for the PGR to communicate research in a wide range of formats: blog posts, presentations and workshops. The supervisory team will also expect the PGR to support the development of publications related to the project, and to lead on the drafting of specific outputs, for which the PGR will receive training and support by supervisors.

The PGR will be expected to assist with grant writing and horizon scanning for funding seeking. S/he will be mentored to seek funding opportunities commensurate with the stage of their career.

The PGR will receive teaching opportunities and will be expected to undertake the 'Introduction to Education Practice' course for PGR students.

SUPERVISORY TEAM	
First Supervisor	Debbie Holley, Professor of Learning Innovation
Additional Supervisors	Jacqueline Priego, PhD Liz Falconer, PhD
Recent publications by supervisors relevant to this project	*Holley (Digital frameworks/Augmented reality)* Biggins, D., Holley, D., Evangelinos, G. and Zezulkova, M., 2017. Digital Competence and Capability Frameworks in the Context of Learning, Self-Development and HE Pedagogy. In: E-Learning, E-Education, and Online-Training (ELEOT) Third International Conference. Dublin, Ireland, pp.46–53. doi: 10.1007/978-3-319-49625-2_6 *best paper awarded at conference Hobbs, M., & Holley, D. (2016) Using Augmented Reality to engage STEM students with an authentic curriculum to be published in the Special Issue of EAI transactions on e-learning http://www.springer.com/gp/book/9783319288826 Holley, D & Howlett, P. (2016) Engaging Our School Teachers: an Augmented Reality (AR) Approach to Continuous Professional Development curriculum to be

	published in the Special Issue of EAI transactions on e-learning http://www.springer.com/gp/book/9783319288826 Evangelinous, G., and Holley, D. (2016) Investigating the Digital Literacy Needs of Students in Healthcare Education to be published in the Special Issue of EAI transactions on e-learning http://www.springer.com/gp/book/9783319288826 Holley, D and Sentance, S 2015 Mobile 'Comfort' Zones: Overcoming Barriers to Enable Facilitated Learning in the Workplace. Journal of Interactive Media in Education, 2015(1): 15, pp. 1–9, DOI: http://dx.doi.org/10.5334/jime.av *Falconer (virtual worlds)* (In press) Savin-Baden M., Falconer L., Wimpenny K. & Callaghan M. (2017) Virtual Worlds for Learning. In Duval E., Sharples M. & Sutherland R (eds) Technology Enhanced Learning: research themes. London: Springer. Ward T., Falconer L., Frutos-Perez M., Williams B., Johns J. and Harold S. (2016) Using virtual online simulations in Second LifeTM to engage undergraduate psychology students with employability issues. British Journal of Educational Technology, 47, (5), pp. 918-931. Savin-Baden M. & Falconer L. (2016) Learning at the interstices: locating practical philosophies for understanding physical/virtual inter-spaces. Journal of Interactive Learning Environments, 24,(5), pp. 991-1003. *Priego (systematic reviews)* Cornish, F., Priego-Hernandez, J., Campbell, C., Mburu, G., & McLean, S. (2014). The impact of community mobilisation on HIV prevention in middle and low income countries: a systematic review and critique. AIDS and Behavior, 18(11), 2110-2134.

INFORMAL ENQUIRIES

To discuss this opportunity further, please contact Prof Debbie Holley via email: dholley@bournemouth.ac.uk

ELIGBILITY CRITERIA

Studentship candidates must demonstrate outstanding academic potential with preferably a 1st class honours degree and/or a Master's degree with distinction or equivalent Grade Point Average. An IELTS (Academic) score of 6.5 minimum (with a minimum 5.5 in each component) is essential for candidates for whom English is not their first language. In addition to satisfying basic entry criteria, BU will look closely at the qualities, skills and background of each candidate and what they can bring to their chosen research project in order to ensure successful completion.

Additional Eligibility Criteria:

- Broad spectrum of IT skills.
- Sound knowledge of, and skills in, educational and/or social sciences research methods, including a good grasp on analytical techniques for non-verbal data.
- Good understanding of the theoretical debates around learning technology interventions.
- Capacity to keep abreast with education technology developments.

HOW TO APPLY

Please complete the online application form by **3 April 2017**. Further information on the application process can be found at: www.bournemouth.ac.uk/studentships