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Editorial

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At Swansea University, led by the College of Engineering, we have been carrying out research into the potential benefits of integrating the use of Virtual and Augmented Reality into our learning and teaching (L&T) provision over the past few years. When seeking to position our work amongst the existing body of knowledge, we found that there was little work related to the use of these technologies specifically to enhance L&T in a Higher Education (HE) context. Similarly despite there being a number of national and international conferences focused on Virtual and Augmented Reality, there were none targeting L&T enhancement. This conference was conceptualized and realized to help identify and bring together other like-minded educators to share expertise and forge future collaborations.

A call for papers was shared widely within the HE community. We received 32 submissions for the conference including 18 paper presentations, 11 posters and 3 interactive demonstrations. The as-received submissions were scrutinized via an anonymized double-blind review process by 8 members of staff from the Swansea University Virtual Reality Working Group. The Working Group comprises members from each of the academic Colleges at Swansea University and other relevant groups such as Information Services and Systems, Projects and Strategic Planning Unit and Swansea Academy of Learning and Teaching.

Each submission was reviewed by two independent reviewers against specified criteria of relevance to the conference theme, quality of submitted abstract, quality

of the research, contribution to the field and the likely audience interest/appeal.

A threshold minimum total score was agreed by the review team and all submissions exceeded this threshold. Despite meeting the threshold, three submissions were subsequently rejected due to lack of relevance of the research to a Higher Education context.

Around 120 delegates attended the conference, of whom 8 were Virtual Delegates. The conference was held over one day on 12th September 2018 at Swansea University Bay Campus. An introductory session to Virtual Reality was delivered by the Swansea University VR team and paper presentations were run in two parallel sessions throughout the day, synchronously delivered in virtual space using the SANSAR social VR platform. Posters were displayed throughout the day with poster authors available to discuss their work and interactive demonstrations were run throughout the day. Virtual delegates were able to navigate around the conference space selecting which sessions to attend and were able to ask questions live.

An opening Keynote was delivered by Danae Stanton-Fraser, Professor in Human Computer Interaction at Bath University, UK and a closing Keynote was delivered via video conference by Professor Astrid Ensslin, Professor in Digital Humanities and Game Studies at the University of Alberta, Canada.

All of the conference session recordings are available at the IMO Swansea University YouTube channel. Following the conference, all conference contributors were invited

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to submit their work for inclusion in these Conference Proceedings and a total of nine contributors submitted papers that we have reviewed and edited and which we present here.

The collection of papers in this inaugural edition draws on evidence and debate from Engineering, Sport and Exercise Sciences, Psychology, Public Health, and, the VR design industry, illustrating the diverse application of VR in HE. Evans begins with a discussion of barriers to VR use in HE, ranging from the language of the discipline to the physical equipment it requires. Based on his qualitative data, he also offers a potential approach to addressing these barriers, including the need for evidence that supports the effectiveness and value of using VR for teaching and learning in HE. The papers that follow offer a range of evidence to this effect, including both qualitative and quantitative studies.

Wood, Dorrington, Xavier and their colleagues present studies conducted with Engineering students that demonstrate the use of VR for enhancing students' conceptual design and creativity skills. Dorrington and his colleagues discuss the space that VR can offer to encourage students' creativity, as is not always the case with more traditional design learning approaches. Related to this, Xavier and her co-authors discuss the sense of environmental presence that VR might bring to students in learning about the design process, again, something more difficult to achieve with traditional design learning approaches. Wood's data show that the VR experience can help students to engage with design processes with increased cognitive depth, resulting in enhanced understanding of these processes.

Similarly, in Sport and Exercise Sciences, Mason and Holmes and Hudson and her colleagues suggest that their use of VR in Anatomy and Health Related Exercise teaching helped students to enhance their learning, and in Mason and Holmes' study, their academic achievement. Hudson and her colleagues also offer VR as a way of making many experiences that are directly inaccessible to students accessible to them, potentially shifting their emotional perspective on the topics these experiences address. Focusing on a very real and contemporary

public health challenge in refugee camps, Dawson and his colleagues present further evidence of this, in addition to demonstrating the value of a virtual classroom and shared learning between students located across different continents. Gillies and Pan continue the discussion of using VR as a means for students to gain access to novel and potentially emotionally challenging situations. They suggest that, particularly in training medical students, VR provides a safe space to develop social skills needed for dealing with often difficult patients.

O'Keeffe and his colleagues then bring the collection to a fitting close with a discussion of the benefits of using VR in HE teaching, some of which are demonstrated in the preceding papers, such as offering safe and accessible experiences that might otherwise be unavailable to students. They also highlight a number of ethical challenges including pressure to conform and participate in VR, and, individual differences in VR experience, that educators and developers in HE need to consider when using VR in teaching.

The papers in this collection share some common themes that are relevant across HE, suggesting the potential for this work to contribute to the broader debates around learning and teaching in HE. For example, a number discuss the potential opportunities that VR offers to develop students' employability profiles, and, interpersonal skills and understanding. Enhancing student engagement is a substantial challenge in HE and another common theme is the enhanced emotional engagement that VR might offer for students. Coupled with this, a number of authors discuss the deeper understanding and learning that they observed through VR based teaching, which of course will always be a priority for educators. The capacity for VR to help students to shift their perspectives was a final common theme that was discussed here. This has always been a goal of HE—to encourage students to see issues and phenomena with new or changed insight. Given the complexity, diversity and most likely dynamic nature of the workplace for HE graduates in the 21st Century, this is clearly a valuable experience.