Virtual reality in education: a tool for learning in the experience age

Elliot Hu-Au* and Joey J. Lee

Department of Communications, Media,
Learning Technologies Design,
Teachers College,
Columbia University,
525 W 120th St. New York, 10027, USA
Fax: +2126788227
Email: elliot.hu-au@tc.columbia.edu
Email: jl3471@tc.columbia.edu
*Corresponding author

- We are now in the Experience Age – where 92% of teens are online daily

- Industrial Revolution model of education:a teacher transmitted information to students via a 'one size fits all' mentality;

- Information Age model: access to and accumulation of information was the highest priority

- Experience Age:interconnected mobile devices, gaming and social networking software have led to sharing and experiencing new points of view

THREE MAJOR CHALLENGES IN FORMAL EDUCATION

First challenge

- Teachers often still rely on transmissionist methods such as lectures, leading to passive, disengaged students (Capps and Crawford, 2013). Learning in this manner, when knowledge is isolated from context, causes many students to struggle to see the relevance to their lives (Gee, 2009).

Second challenge

- Authentic learning contexts require many factors that are either difficult to attain or simply absent from traditional teaching methods (Hill and Smith, 2005).

TANGIBLE PRODUCT

COLLABORATIVE LEARNING

DEFINED AUDIENCE

BLENDED SCHEDULING

ROLE PLAYING

INTEGRATED SUBJECTS

PORTFOLIOS

PERSONALIZED EXPERIENCE

WELL DEFINED CRITERIA

DESIGN BACK PLANNING

PROFESSIONAL DEVELOPMENT

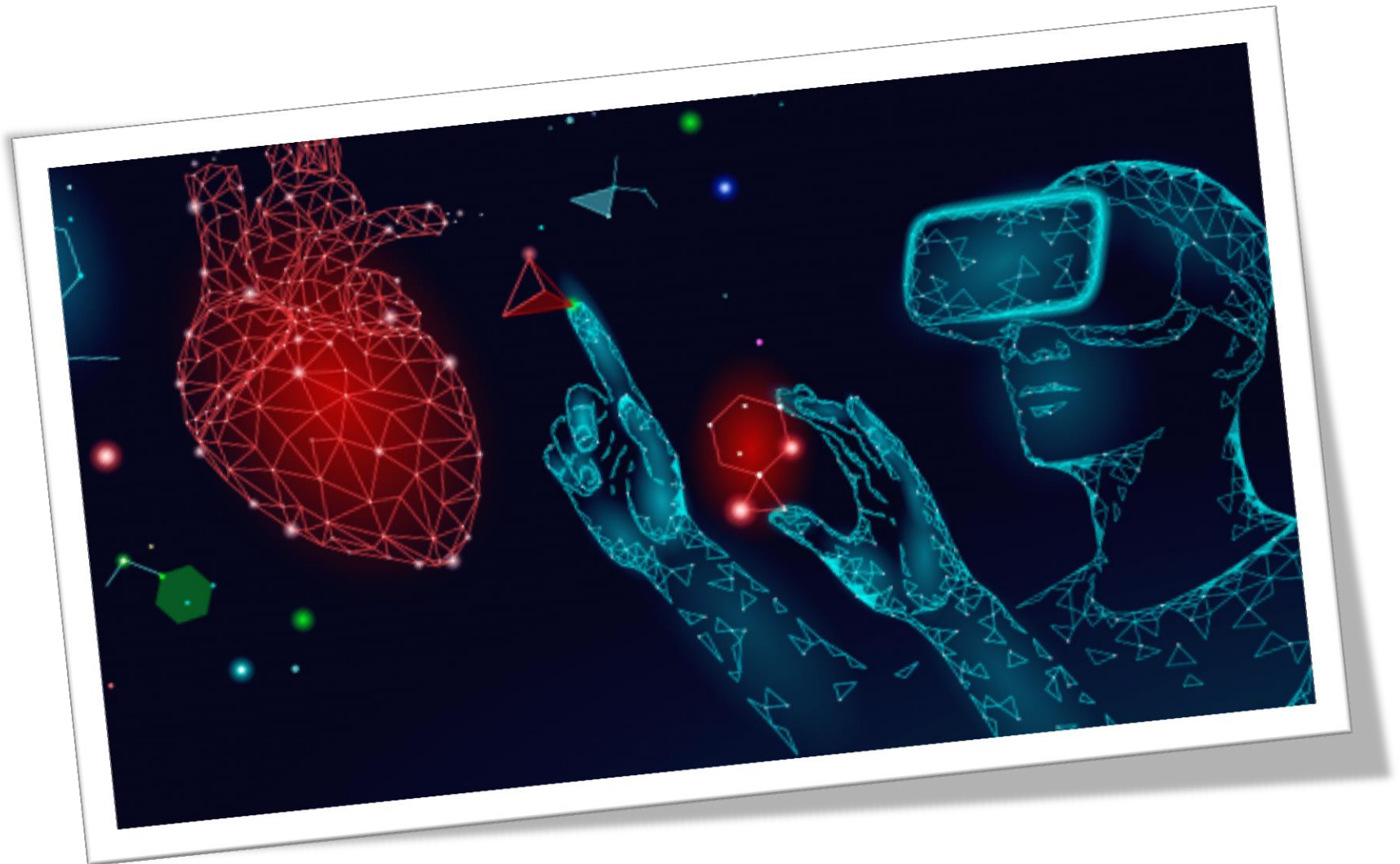MASTER CONSULTATION

12 ESSENTIALS OF AUTHENTIC LEARNING

Steve Revington
www.authenticlearning.weebly.com

Third Challenge

- Important skills needed for 21st century learners such as empathy, systems thinking, creativity, computational literacy, and abstract reasoning are difficult to teach (Smith and Hu, 2013).

Virtual Reality

The evolution of virtual reality

- Recreations

- Military

- Expensive

- Google Cardboard, Daydream View, Oculus Rift, HTC Vive, Samsung Gear VR, Playstation VR, and Microsoft HoloLen

Definition

- VR is a part of a larger family of technology-mediated experiences involving a varying degree of blends of reality with virtual components.

- Related areas along this continuum of reality and virtuality are augmented reality and mixed reality

Milgram's reality–virtuality continuum

Mixed Reality (MR)

Real Environment — Augmented Reality (AR) — Augmented Virtuality (AV) — Virtual Environment
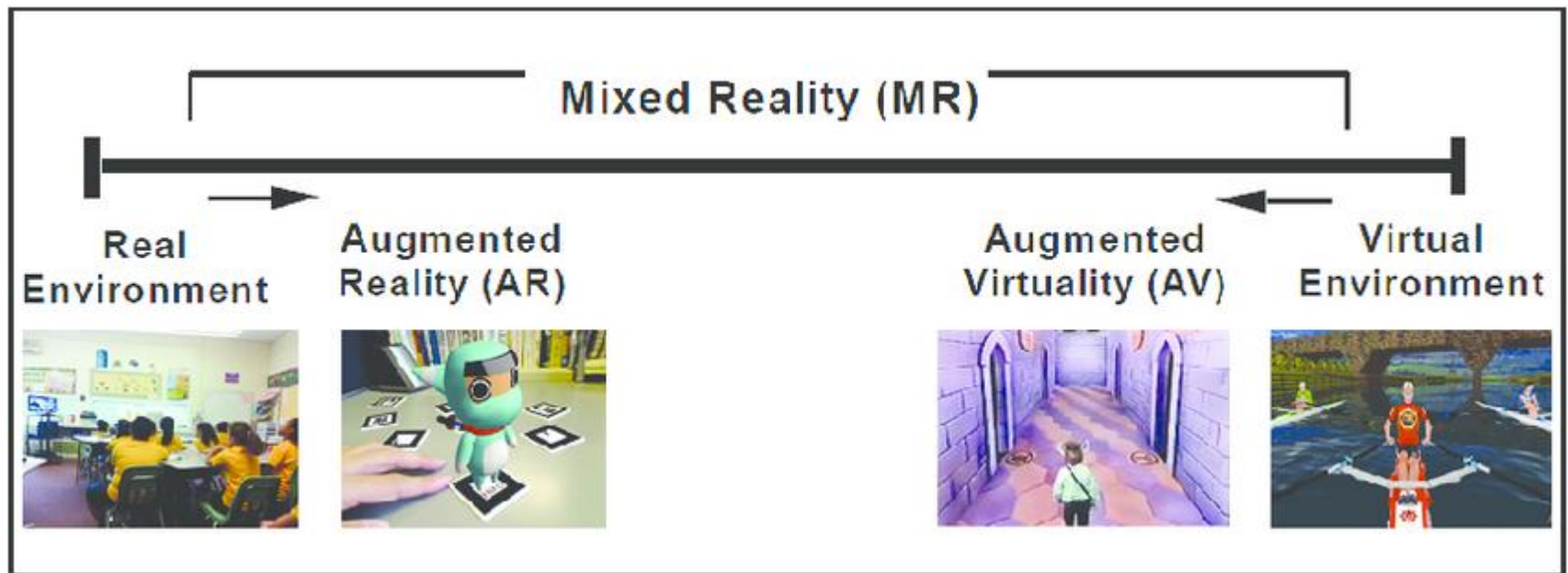
Problems in education and opportunities in VR

- **Problem:** traditional methods of teaching lead to a lack of student engagement

- **Opportunity:** virtual reality leads to increased student engagement
- interactive, immersive experience, it provides a novel way of learning for students, delivering powerful new experiences
- Google Expeditions

- By enveloping a student in an authentic, multi-sensory experience, VR makes a subject area come alive.

- For instance, students have the opportunity to navigate inside the human body's bloodstream as a red blood cell in **The Body VR**

- Opportunity: virtual reality allows for constructivist learning
- allowing students to construct their own knowledge from meaningful experiences.
- students engage in authentic problems, exploring solutions and perhaps collaborating with others

- VR also provides an opportunity for training, therapy, or simulation in situations where repeated practice and a safe space to fail are present. This can be useful as spaces for therapy for students with disabilities, post-traumatic stress disorder, or social anxiety.

- VR applications such as *VR Language Learning* and *Public Speaking VR*

- Problem: it is difficult to deliver authentic, highly relevant contexts for learning
- Students often find classroom-based learning to be irrelevant; there is a disconnect between content learned in textbooks and authentic practice in the 'real-world'

- Opportunity: virtual reality provides authentic experiences to impact student identity

- VR makes it possible to visit any location, time, or person in a relatively inexpensive way via virtual field trips.

- Google Expeditions, for example, contains '***career expeditions***' experiences where students can 'shadow' a scientist or professional in their laboratory or offic

- Problem: teaching 21st century skills in a traditional classroom setting is difficult
- creativity, empathy, critical thinking, and technological literacy

- **Opportunity:** virtual reality affords new perspective taking and empathy
- when students were given a VR experience of being an elderly person their empathy towards older generations significantly increased

- Opportunity: virtual reality affords creativity and the ability to visualise difficult models
- VR also enables students to create anything from their imagination and to easily visualise and manipulate objects to make difficult concepts easier to grasp.
- Inside creation-oriented or world-building virtual environments

CoSpaces
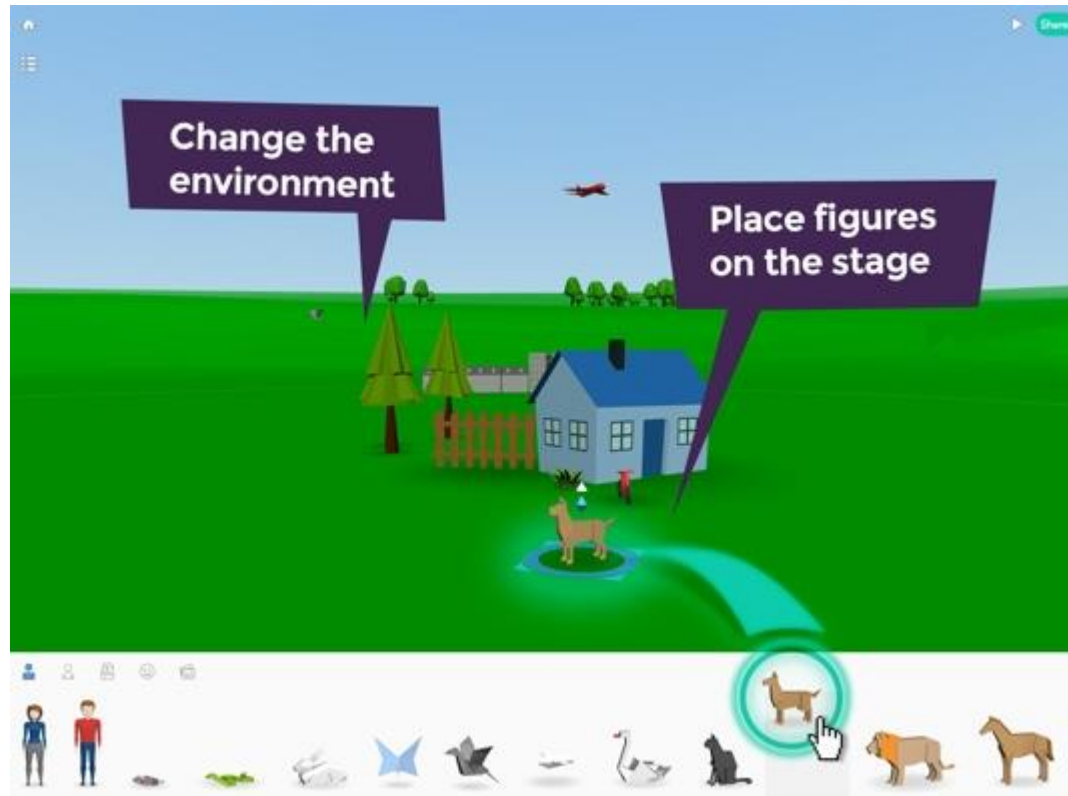
Tiltbrush

- students can paint, sculpt, and design life-sized three-dimensional objects and landscapes using imaginative – and impossible materials such as fire, snow and stars – and share them with others

Conclusion

- VR is especially useful for providing several opportunities:
- increasing student engagement;
- providing constructivist, authentic experiences to impact student identity;
- allowing for new perspective taking and empathy;
- supporting creativity and the ability to visualise difficult models.

Remember

- The best way to use virtual reality in learning is to create experiences that help students to understand the learning context better

Virtual Reality must not shade us from the realities of humanity or else we'll cease to be human.

Thank you

alizadehm@tbzmed.ac.ir

Alizadm@yahoo.com

Mahasti_alizadeh

@AlizadmMahasti