INSPIRE 5

Teaching with XR – Ali Arya



TLS 800-11

About Me

- School of Information Technology
 - Interactive Multimedia
 - Games, VR, HCI, Ed Tech
- Worked on VLE since 2010
 - Carleton Virtual
- Immersive Technologies since 2013
 - AR for customized classroom information
 - Inclusive VR
 - Multi-platform Web-based
 - Accessible
 - Community-engaged
- <u>http://img.csit.Carleton.ca</u>







My Teaching

- Undergrad Teaching
 - Intro to multimedia
 - Programming and software design
 - Game Design and development
- Grad courses
 - Research methods
 - Interdisciplinary research
 - Interactive media and digital art





Teaching Innovation Fellowship

- Continuing work started from other funding sources
- Multi-platform VR for Education
 - CIRCLES framework
 - Management interface
 - Revised application library
 - VR-based course modules
 - Cognitive Science
 - Physics
 - Biology
 - Other VR-based educational experiences
 - Indigenous gathering place







- The VR projects was not used directly in my own courses.
 - On sabbatical and admin leave for two years!

Involving Students

- Developing a framework that can be used by all instructors.
- The VR framework has provided examples and tools in some of CSIT courses.
- The project has directly engaged students from my courses as research assistant.





- Unique affordances: Immersion, Interaction, Visualization
- Increased engagement and understanding
- Additional tool together with others
- A new educational paradigm: In-class, distant, virtual (zoom to VR), Hybrid



Why use XR in teaching



Changing dynamics in the classroom

- Positive
 - Creating experiences that are hard or impossible to have in physical world
 - Convenience of working from "anywhere"
 - Programmability and customization for personalized and accessible experience
 - Combining with AI
- Negative
 - Losing some personal connection and in-person conveniences
 - Technology difficulties
 - Cost of development vs. gained advantages



Experiential Learning

- Simulating hands-on tasks
- Simulating various environments and situations
- Ability to add intelligence
- Does not replace "real-world" experience
- Increased accessibility and inclusion
 - Although XR has its own inclusion issues to be resolved





HEB M Ellis Joynes, Standan Tao, Kylle Ov Emily Chan

HES Anastacia Corbenko, M Osobergi, Sam Lamouer Prevost



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Risks

Scaring or overwhelming learners due to technology overhead



Oversimplifying the experience resulting in limited or incorrect understanding in learners



Causing new inclusion issues



Over-reliance and ignoring real-world experience

Under-utilization due to limited added value



Barrier



Purchase and deployment cost



Design and development Needs collaboration of many groups



Adoption by educators

Needs learning new things and adjusting methods



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Adoption by learners

Needs being convinced of advantages and overcoming difficulties



Inclusion

Should be inviting and engaging for different groups



Suitability

Not for every learning activity Needs more research





• Increased engagement : Can be temporary though (wow factor)

Benefits

- Better visualization and understanding: Not for all subjects
- Customizable: For inclusion and accessibility





- Needs more research to work on mentioned risks and barriers
 - Inclusion
- hts Suitability and efficacy
 - Personalization and combining with AI
 - XR-based pedagogy



Future thoughts

Getting started

- Lower expectation
 - No tool is going to solve all problems
 - Combining with in-person, zoom, and other tools
- Use low-cost and "portable" experiences
 - Web-based frameworks may be the future
- Experience with high-end products
 - They will become cheap soon
- Invest time (and other resources)
 - It can take significant resources to do XR right
 - Form partnerships
 - Contact TLS





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Q&A

- What worked well?
 - Support from TLS
 - Working with students
 - Connecting to other faculty members in
- What accessibility considerations did you make?
 - Accessibility was a key goal of the project. The main achievement was the multi-platform design, and starting inclusive sub-projects.
- Did your project impact student learning?
 - Too early to say.
- What were some of the challenges?
 - Finding instructors who have time to invest on XR development
 - Working with students who have academic pressure and obligations
- What would you do differently?
 - Focus on one partner/course
- What would you do the same?
 - Engaging undergrad students in the development
- What is next?
 - Improving the framework and its usability for instructors
 - Running studies to see the effect

