Remembering Mithras: Is VR an Effective Tool to Learn About the Past?

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Overview

What is VR?

Using VR for learning

Building the experience

Experimental design

Results

Conclusions





What is VR?

Sensorama Image. (2018). Wikimedia Commons. Retrieved from https://commons.wikimedia.org/wiki/File:Sensorama-morton-heilig-virtual-reality-headset.jpg,

Vive Image (2017). Wikipedia. Retrieved from https://sco.wikipedia.org/wiki/Virtual_reality

Bailenson's Rules for VR

Expensive

Dangerous

Impossible

Rare

IO KEY BENEFITS OF VR IN EDUCATION



GLOBAL TELEPORTATION

Learners can travel to places they may not be able to visit in reality.



CONTEXTUALISED LEARNING

Learning can take place in a relevant setting to aid understanding.



THE TIME MACHINE EFFECT

Learners can experience cultures and historical events first hand.

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MULTI-SENSORY EXPERIENCES

Learners engage with content in a multisensory, visceral way.



EXTRAORDINARY ABILITIES

Learners can break the laws of physics and interact in unique ways.



ACTIVE

Learners are able to direct their path within a virtual experience.



EMPATHY AGENT

Emotive responses to content helps to foster empathy for others.



VIRTUAL REHEARSAL

Learners can develop skills in a safe, secure environment.



PRESENCE

Learners can connect remotely for global learning experiences.



FOCUSED IMMERSION

Learners are engulfed and engaged with the learning content.

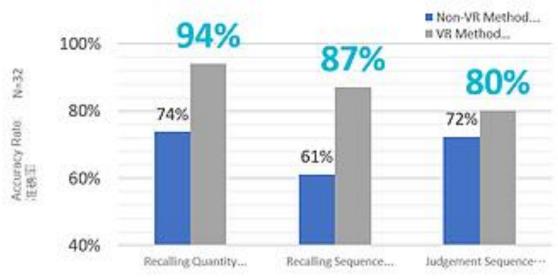
Icons courtesy of The Noun Project

Bambury, S. (2019, March 31). 5 Key Barriers to VR Adoption in Schools. Retrieved from https://www.virtualiteach.com/single-post/2019/03/31/5-Key-Barriers-to-VR-Adoption



VR Significantly Improve Students' Retention of Learning.

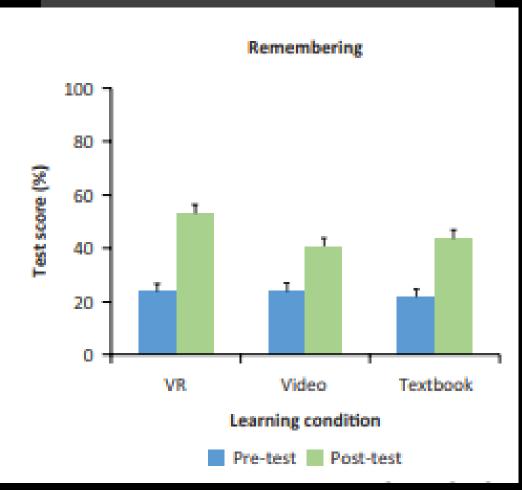




Source of Datas 北京特征大学心理学部 研密源 數據 [基于他和現实技术的治定與關係中,2018]

Warwick University: Plant Cell

Text, Video, VR



Pre: 25%, 28%, 28%

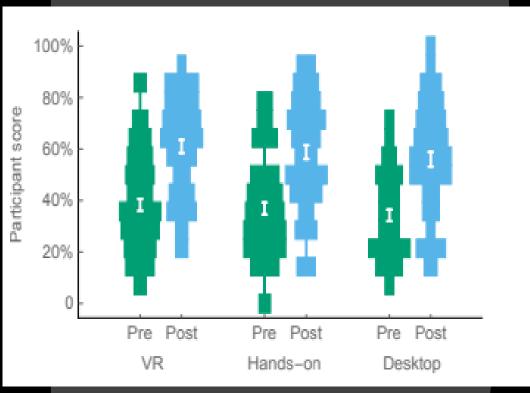
Post: 50%, 43%, 57%

VR and textbook better than video

Allcoat, Devon and von Mühlenen, Adrian (2018) Learning in virtual reality: effects on performance, emotion, and engagement. Research in Learning Technology, 26.2140.doi:10.25304/rlt.v26.2140

Cornell University: Moon Phases

Pre: 36%



Post: 58%

No significant difference

Madden, J., Won, A., Schuldt, J., Kim, B., Pandita, S., Sun, Y., Stone, T., & Holmes, N. (2018, August 1-2). Virtual Reality as a Teaching Tool for Moon Phases and Beyond. Paper presented at Physics Education Research Conference 2018, Washington, DC. Retrieved from https://www.compadre.org/Repository/document/ServeFile.cfm?ID=14819&DocID=4966

Advantages of VR

Training-Physical

Visualising content (i.e. Chemistry)

Spatial

Dynamic

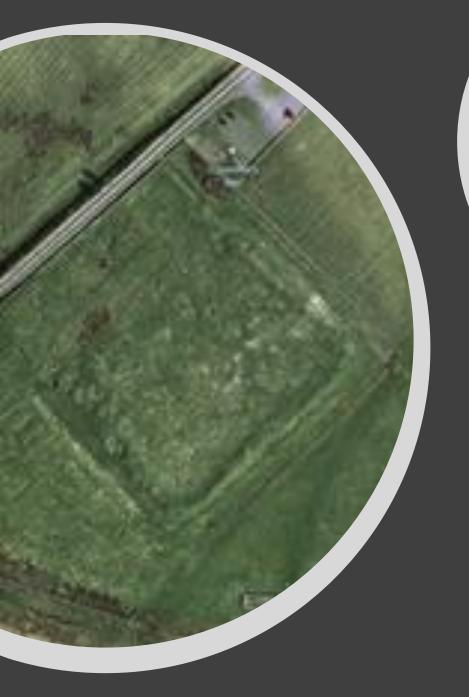
Disadvantages of VR

Physical Effects (i.e. eye strain, motion sickness)

Cost

No Guidelines/Best Practices

Making content fit an experience

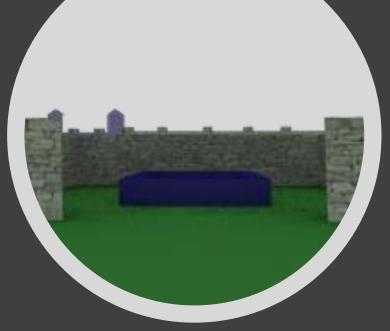






Why Carrawburgh?







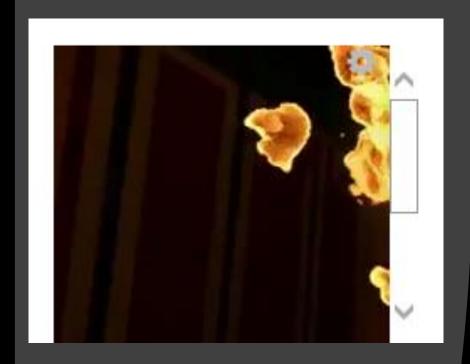
Building the Experience

Modelling the Mithraeum



Carrawburgh Mithraeum by debmayers24 on Sketchfab

Experience Design



E-Learning and Experiential Learning

Voice of Mithras telling participants information

Light the torches for upcoming ceremony

Ability to move freely and grab objects

Experimental Design

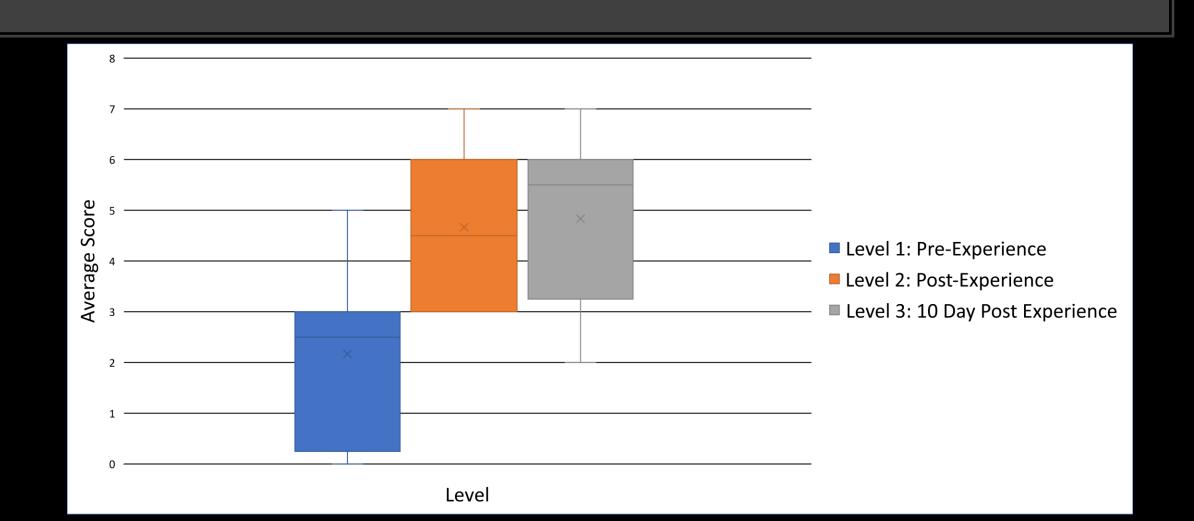
Pseudo-Longitudinal, Between Subjects Design

Independent Variable: Time the Learning Questionnaire was Distributed.

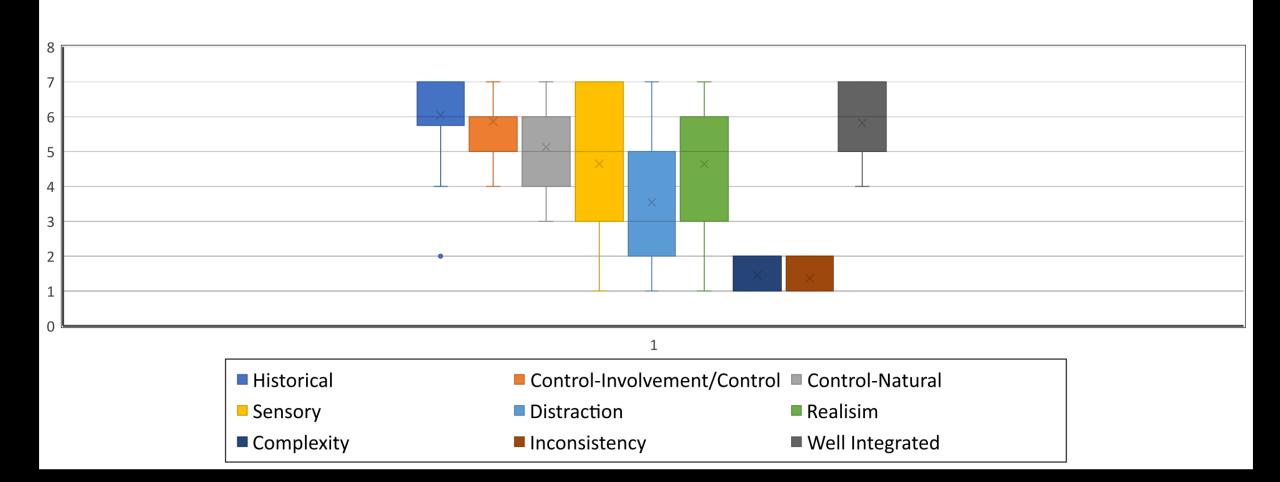
Dependent Variable: Participant Score on the Questionnaire.

Pre-Experience, Post-Experience, and Learning Questionnaires

Learning Questionnaire Score



Factors Measured



Lessons Learnt

The story and interaction matters

Think about sensory engagement

Realism isn't as important

Multiple interpretations

Show the current site and the past

Allow free exploration

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Sources

https://commons.wikimedia.org/wiki/File:Sensorama-morton-heilig-virtual-reality-headset.jpg

https://sco.wikipedia.org/wiki/Virtual_reality_

https://www.af.mil/News/Article-Display/Article/1414771/researchers-test-virtual-reality-adaptive-flight-training-study/

https://www.virtualiteach.com/single-post/2019/03/31/5-Key-Barriers-to-VR-Adoption

Madden, J., Won, A., Schuldt, J., Kim, B., Pandita, S., Sun, Y., Stone, T., & Holmes, N. (2018, August 1-2). Virtual Reality as a Teaching Tool for Moon Phases and Beyond. Paper presented at Physics Education Research Conference 2018, Washington, DC. Retrieved April 3, 2019, from https://www.compadre.org/Repository/document/ServeFile.cfm?ID=14819&DocID=496

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Allcoat, D., & A. von Muhlenen. (2018) Learning in virtual reality: Effects on performance, emotion and engagement. Research in Learning Technology. 26:2140

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• Github:

https://github.com/dmayers340/unityMithraeum

