

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

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# Overview

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What is VR?

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Using VR for learning

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Building the experience

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Experimental design

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Results

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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](https://sco.wikipedia.org/wiki/Virtual_reality)

## Bailenson's Rules for VR

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Expensive

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Dangerous

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Impossible

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Rare



# 10 KEY BENEFITS OF VR IN EDUCATION



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www.virtualiteach.com

Icons courtesy of The Noun Project

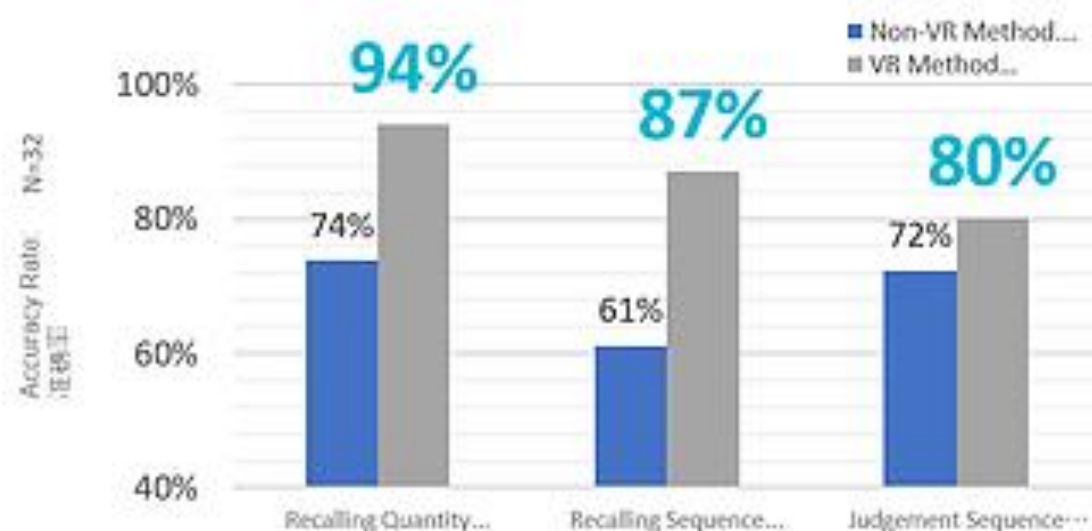




北京師範大學  
BEIJING NORMAL UNIVERSITY



## VR Significantly Improve Students' Retention of Learning.



Source of Data:  
北京师范大学心理学部 郑思源 教授  
(基于虚拟现实技术的记忆力研究-2018)

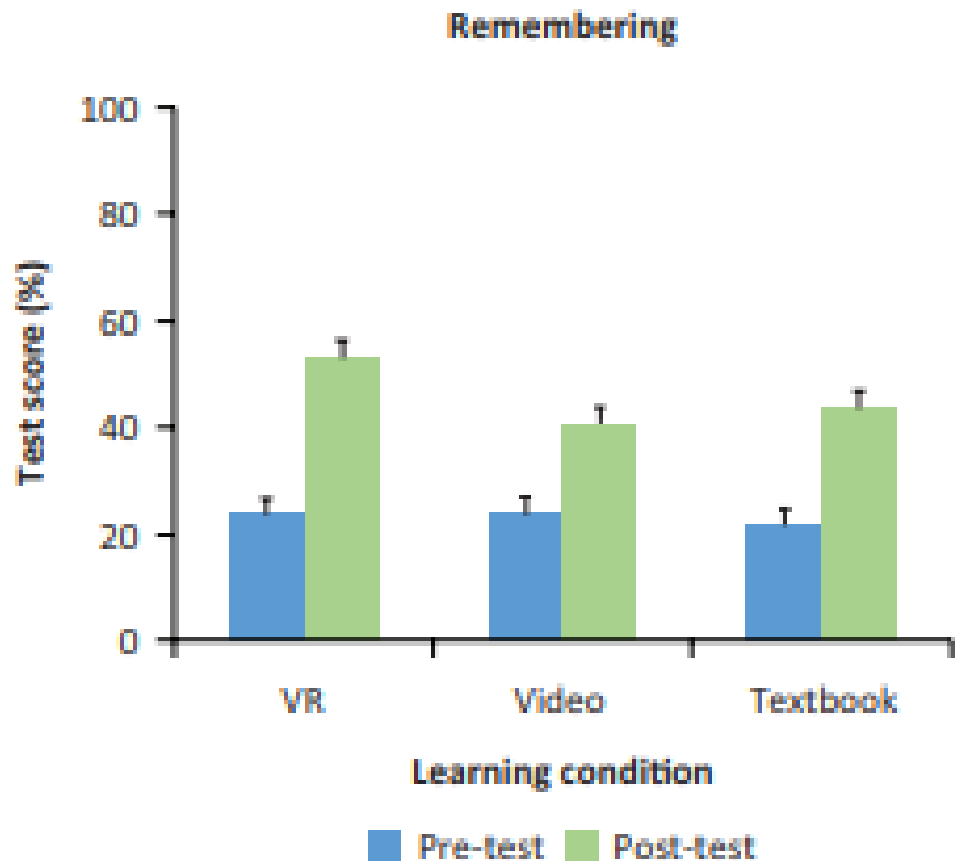
# Warwick University: Plant Cell

Text, Video, VR

Pre: 25%, 28%, 28%

Post: 50%, 43%, 57%

VR and textbook better than  
video

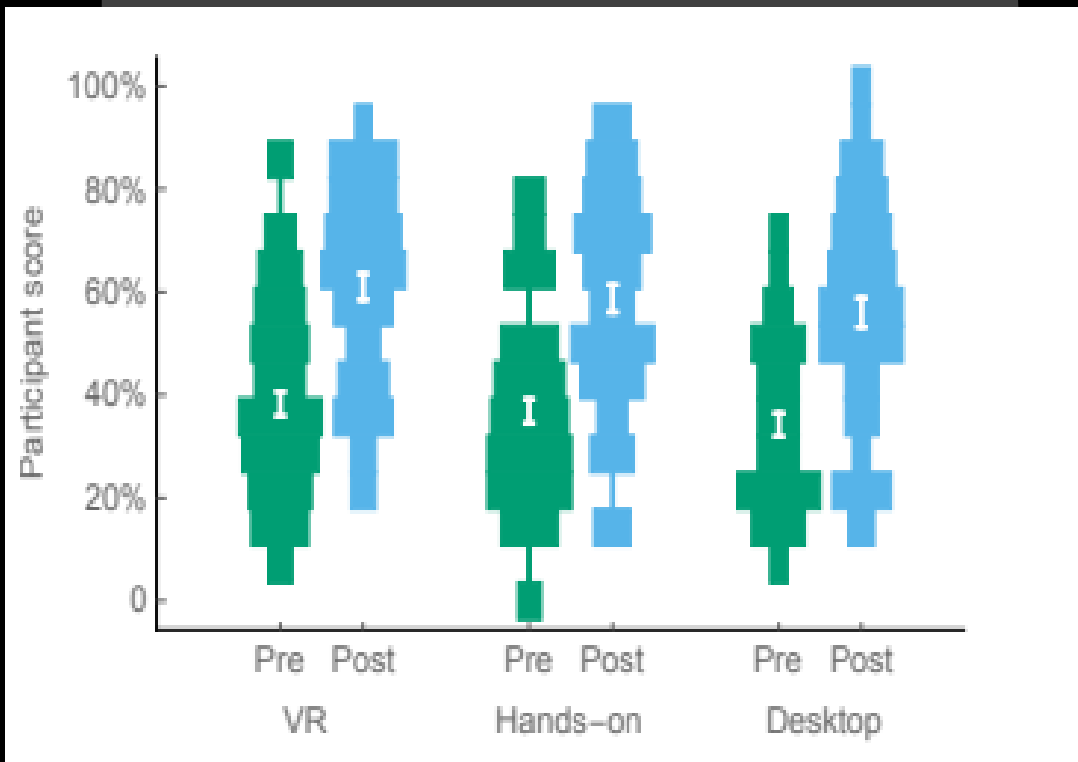


# Cornell University: Moon Phases

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

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Training-Physical

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Visualising content (i.e.  
Chemistry)

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Spatial

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Dynamic

## Disadvantages of VR

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

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Cost

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No Guidelines/Best Practices

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Making content fit an experience



Why Carrawburgh?



Building the Experience

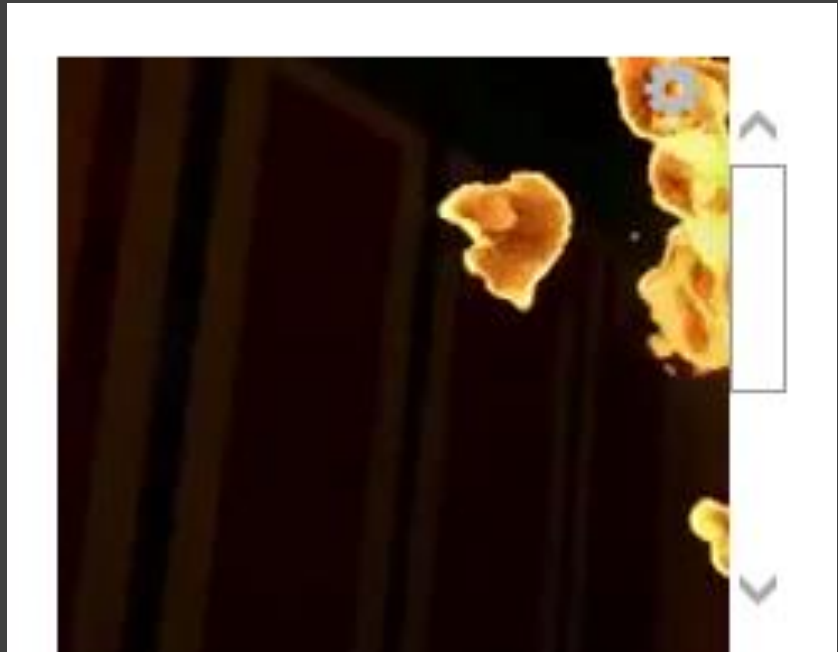
# Modelling the Mithraeum



Carrawburgh Mithraeum by debmayers24 on Sketchfab



# Experience Design



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E-Learning and Experiential Learning

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Voice of Mithras telling participants information

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Light the torches for upcoming ceremony

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Ability to move freely and grab objects

# Experimental Design

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Pseudo-Longitudinal, Between Subjects Design

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Independent Variable: Time the Learning Questionnaire was Distributed.

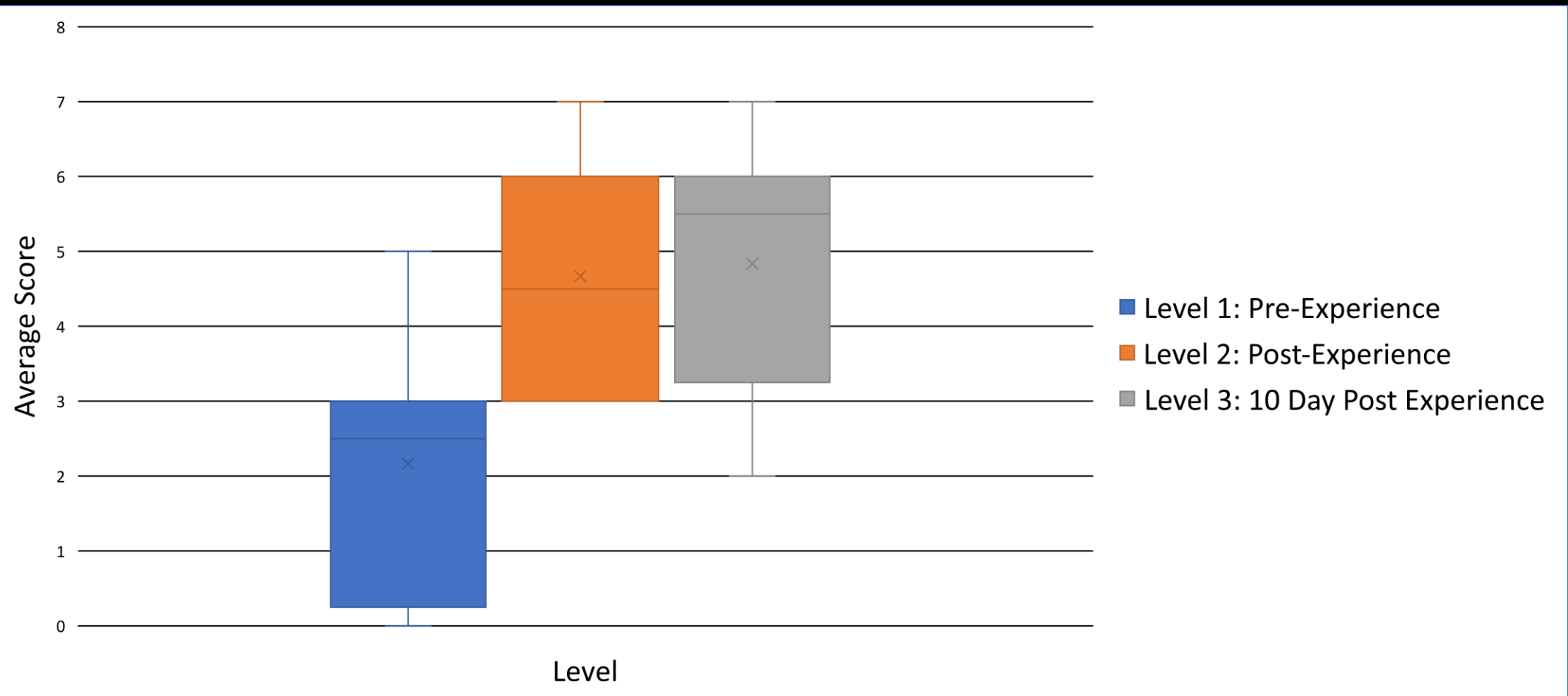
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Dependent Variable: Participant Score on the Questionnaire.

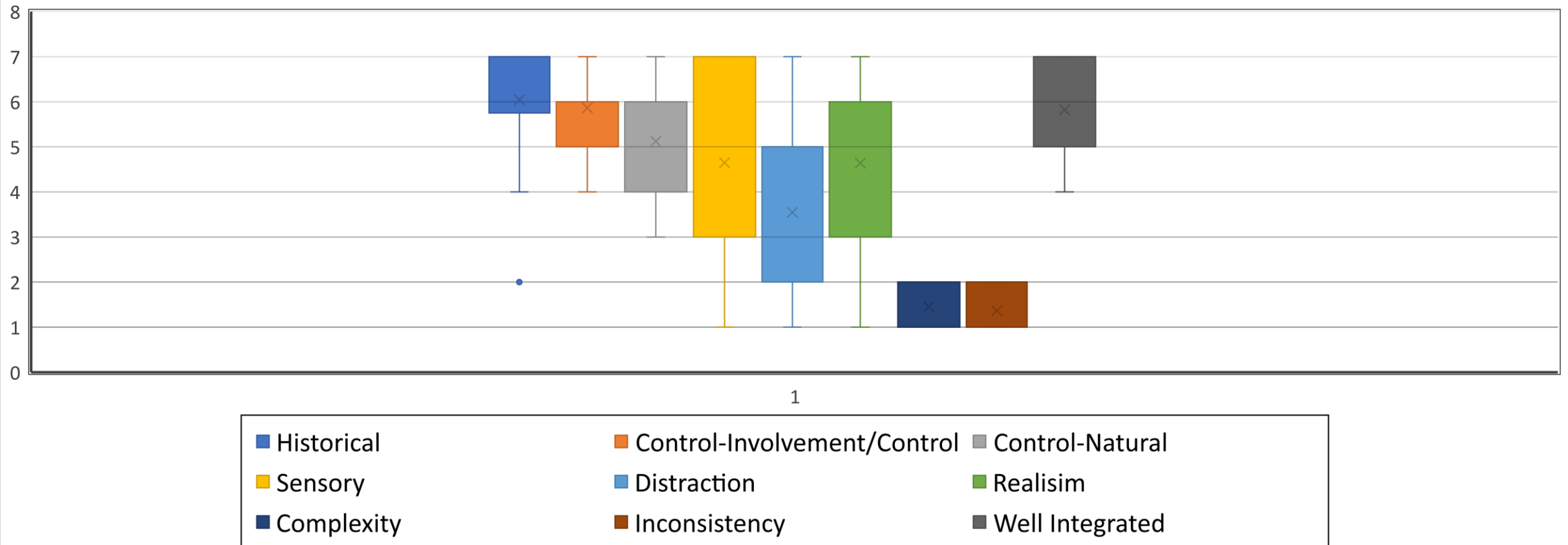
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Pre-Experience, Post-Experience, and Learning Questionnaires

# Learning Questionnaire Score



# Factors Measured



## Lessons Learnt

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The story and interaction matters

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Think about sensory engagement

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Realism isn't as important

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**Multiple interpretations**

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**Show the current site and the past**

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Allow free exploration



# Is VR an Effective Tool to Learn About the Past?

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# Sources

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[https://sco.wikipedia.org/wiki/Virtual\\_reality](https://sco.wikipedia.org/wiki/Virtual_reality)

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

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

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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=4966>

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>

