Immersive Experiences of Biblical Proportions

Blue Faculty Research Grant

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About Us

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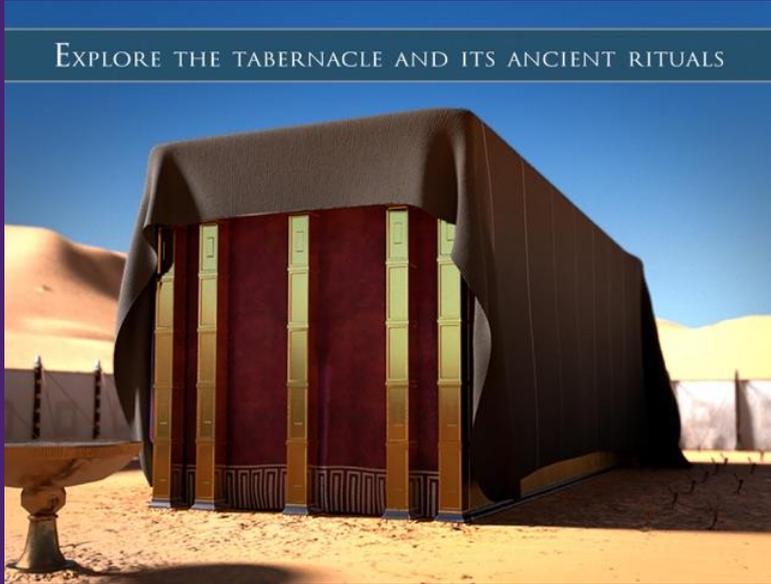Assistant Director of Innovation Foundry and Educational Technology

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Introduction(The Why)

Abilene Christian University offers many biblical studies courses, including those specifically related to the narrative message of the Old Testament. It is difficult for students to visualize distant locations described in the Bible, and a picture or video representation is often a flat experience. Virtual Reality (VR) opportunities make historical religious sites come to life by allowing students to explore ancient relics as they were.

EXPLORE THE TABERNACLE AND ITS ANCIENT RITUALS

Literature Review - Virtual Reality

- VR meets several pedagogical needs in education (Stoddard, 2018)
- VR is immersive and engaging (Stoddard, 2018; Asad, et al., 2022)
- VR poised to be disruptive and influential in education (Majid & Shamsudin, 2019)

Literature Review - Pedagogy

- Increase student engagement (Radianti et al., 2020; Weyhe et al., 2018)

- Access to: (Bailenson, 2018)

  - abstract concepts,

  - inaccessible locations, or

  - unique but replicable scenarios

Literature Review - Pedagogy

- Increase learner motivation (Makransky et al., 2021; Huang et al., 2010)

- Offer experiential learning experiences

- Develops empathy

- Increase sensory perception

Literature Review - Religious Education

- Understanding how the detailed narrative description of the ornate worship site of an ancient nation is still relevant to understanding God's image
- Often misunderstand the extensive descriptive passages of how God chose to dwell amongst the early Jews even amid their sinful and rebellious state (Henrich, 2006)

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Objectives

- To examine the pedagogical effectiveness of using virtual reality software in an introductory Old Testament Bible course.

- To compare the use of virtual reality software and viewing a video in an introductory Old Testament Bible course.

- To determine if test scores increase using a virtual reality experience instead of a traditional video.

Methodology

At Home Reading Quiz (n=36)

Lecture on the Mosaic Law and the Tabernacle (n=36)

CG: Watched Video (n=11)

EG: Participated in VR (n=20)

Post Event Quiz (n=31)

Unit Exam with Questions from Quiz 2 Weeks Later
CG (n=9)
EG (n=17)

Interview with EG Student Participant

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The Perception of VR Questionnaire

Rate your agreement with the following statements on a scale of 1 to 9 with 1 being strongly disagree to 9 being strongly agree.

1. Virtual reality can enhance my interest in learning. (Interest)
2. Virtual reality can enhance my motivation to learn. (Motivation)
3. I pay more attention when using virtual reality to learn. (Attention)
4. I feel that the virtual reality simulation will/did help me understand the tabernacle layout and elements. (Tabernacle)
5. I feel that the virtual reality simulation will/did help me understand the elements of covenant relationship with God. (Covenant)

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Perception of VR Outcomes

Significance Test Comparing the Student Perception of the Use of VR

	Mean	Std. Error	t	df	Sig (1-tailed)
Interest_Post - Pre	0.4	0.48341	0.8271	19	0.209
Motivation_Post - Pre	0.5	0.31204	1.602	19	0.063
Attention_Post - Pre	0.9	0.4696	1.917	19	0.035
Tabernacle_Post - Pre	0.95	0.45	2.111	19	0.024
Covenant_Post - Pre	0.45	0.49987	0.9	19	0.19

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The Tabernacle Questionnaire

- What items are located in the Outer Courtyard of the Tabernacle? (select all that apply)
  - Altar of Incense, Altar of Sacrifice, Laver, Menorah, Table of Shewbread
- What items are located in the Holy Place of the Tabernacle? (select all that apply)
  - Altar of Incense, Altar of Sacrifice, Laver, Menorah, Table of Shewbread
- What sits on top of the ark of the covenant?
  - 2 Gold Cherubim, 2 Golden Calves, A Molden Image of God, An Altar to Burn Incense
- What is inside the ark of the covenant? (select all that apply)
  - Aaron's Staff, Pot of Manna, The Holy Grail, A Map to the Garden of Eden, A Menorah, A Piece of the True Cross, A Vial of the Blood from the First Sacrifice in the Tabernacle.

Outcomes

Independent Samples t-Test (VR - Video) (Equal Variance Assumed)

H0: VR - Video = 0

Ha: VR - Video > 0

	Mean Difference	Std. Error Difference	t	df	Sig (1-tailed)
Q1Diff	-0.3	0.25325	-1.185	29	0.877
Q2Diff	-0.05303	0.15545	-0.341	29	0.632
Q3Diff	0.10909	0.17229	0.633	29	0.266
Q4Diff	0.29	0.22354	1.297	29	0.103
TotalDiff	0.04606	0.57181	0.081	29	0.468
Exam2	0.286	0.172	1.665	13	0.06

Outcomes

Regression Analysis

Model Summary: Understand Covenants = -0.183 + 0.963(Motivation) + 0.724(Understand Layouts) - 0.686(Interest)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869	.755	.712	.9809

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.522	3	16.841	17.503	.000
	Residual	16.356	17	.962		
	Total	66.878	20			

Student Interview

- VR offers unique opportunities to access inaccessible places.
- VR enhances engagement and motivation in learning.
- Acknowledged potential limitations and expenses of VR.
- Not a complete replacement for traditional classroom learning.
- Potential for VR in education:
  - Suitable for virtual field trips.
  - Offers convenience in learning.
  - Possibility of replacing Zoom meetings with VR meetings.

Impact

- Overall Impact:
  - Revolutionizes pedagogical practices
  - Enhances engagement and understanding
  - Improves information retention
- Community Impact (Our University):
  - Significance of VR for students
  - Expand VR opportunities in disciplines

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Conclusion

Limitations, Delimitations

Future Research

Impact at ACU

References

Asad, M. M., Naz, A., Churi, P., Guerrero, A. J. M., & Salameh, A. A. (2022). Mix Method Approach of Measuring VR as a Pedagogical Tool to Enhance Experimental Learning: Motivation from Literature Survey of Previous Study. Education Research International, 1–9. https://doi.org/10.1155/2022/8262304

Bailenson, J. (2018). *Experience on Demand: What Virtual Reality Is, How It Works, and What It Can Do*. WW Norton.

Exodus: What's So Special About the Tabernacle? Podcast | BibleProject™. (2022, May 2). The Bible Project. Retrieved December 6, 2022, from https://bibleproject.com/podcast/whats-so-special-about-tabernacle/

Henrich, S. S. (2006). Seen and Unseen: The Visibility of God in Exodus 25-40. *Word & World*, 103-111.

Huang, H.-M., Rauch, U., & Liaw, S.-S. (2010, November). Investigating learners' attitudes toward virtual reality learning environments: Based on a constructivist approach. *Computers & Education*, *55*(3), 1171-1182. Elsevier. https://doi.org/10.1016/j.compedu.2010.05.014

Majid, F. A., & Shamsudin, N. M. (2019, Dec). Identifying Factors Affecting Acceptance of Virtual Reality in Classrooms Based on Technology Acceptance Model (TAM). *Asian Journal of University Education*, *15*(2), 51-60. ERIC.

References (p. 2)

Makransky, G., Andreasen, N. K., Baceviciute, S., & Mayer, R. E. (2021). Immersive virtual reality increases liking but not learning with a science simulation and generative learning strategies promote learning in immersive virtual reality. *Journal of Educational Psychology*, *113*(4), 719-735. APA PsycNet. https://doi.org/10.1037/edu0000473

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020, April). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education*, *147*, 1-29. Elsevier. https://doi.org/10.1016/j.compedu.2019.103778

Stoddard, J. D. (2018). Learning history beyond school: Museums, public sites, and informal education. In S. A. Metzger, & L. McArthur Harris (Eds.), The Wiley international handbook of history teaching and learning. Wiley. Credo Reference: https://acu.idm.oclc.org/login?url=https://search.credoreference.com/content/entry/wileytal/learning_history_beyond_school_museums_public_sites_and_informal_education/0?institutionId=4602

Weyhe, D., Uslar, V., Weyhe, F., Kaluschke, M., & Zachmann, G. (2018, November). Immersive anatomy atlas-empirical study investigating the usability of a virtual reality environment as a learning tool for anatomy. *Frontiers in Surgery*, *5*, 1-8. National Library of Medicine. https://doi.org/10.3389/fsurg.2018.00073