

# Matthew Patrick Orr

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Salt Lake City, UT 84112

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## EDUCATION

**PhD, Learning and Cognition** 2024  
**The University of Utah**, Salt Lake City, Utah  
Department of Educational Psychology  
Advisor: Kirsten R. Butcher

**M.S., Learning and Cognition** 2020  
**The University of Utah**, Salt Lake City, Utah  
Department of Educational Psychology  
Advisor: Kirsten R. Butcher

**B.S., Psychology** 2014  
**The University of Utah**, Salt Lake City, Utah

## RESEARCH and DESIGN EXPERIENCE

**Graduate Student Researcher** 2015-2024  
The University of Utah  
Center for the Advancement of Technology in Education

**Graduate Student Researcher** 2015-2024  
The University of Utah  
The Multimedia and Instructional Design Lab

**Graduate Student Research and Design** 2018-2021  
The University of Utah/Natural History Museum of Utah  
EPIC Bioscience Design Team

**Graduate Student Researcher** 2017-2020  
The University of Utah  
Advanced Instructional Systems and Technologies Lab

**Undergraduate Student Researcher** 2013-2014  
The University of Utah  
Visual Perception and Spatial Cognition Lab

<b>Undergraduate Student Researcher</b> The University of Utah Huntsman Cancer Institute Jette Lab	2011-2014
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<b>Undergraduate Student Researcher</b> The University of Utah Huntsman Cancer Institute Stewart Lab	2011-2014
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## **HONORS & AWARDS**

Steffensen Cannon Fellowship The University of Utah, Salt Lake City, UT	2022
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Steffensen Cannon Fellowship The University of Utah, Salt Lake City, UT	2021
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Graduate Certificate in Statistics The University of Utah, Salt Lake City, UT	2020
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Certificate in Human Factors The University of Utah, Salt Lake City, UT	2014
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## **SERVICE**

College of Education Executive Committee The University of Utah	2020-2021
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Student Advisory Committee The University of Utah	2019-2024
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Learning, Instruction, and Technology Conference Committee The University of Utah	2019
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Faculty Search Committee The University of Utah	2017
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## **COURSES TAUGHT**

EDPS 6447 Introduction to Web-Based Tools The University of Utah	Summer 2021
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EDPS 6560 Multimedia Learning The University of Utah	Spring 2021
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## PUBLICATIONS

### JOURNAL PUBLICATIONS

Butcher, K.R., Power, M., Larson, M., Velásquez-Franco, S., **Orr, M.**, Bailey, V., & Hudson, M. (2021). Museum leadership for engaging, equitable education: The transformative potential of digitized objects for authentic science experiences. *Curator: The Museum Journal*.

Butcher, K.R., Power, M.J., Larson, M., **Orr, M.P.**, Velásquez-Franco, S., Hudson, M.A. and Bailey, V.J. (2021), Museum leadership for engaging, equitable education: The transformative potential of digitized collections for authentic learning experiences. *Curator*, 64, 383-402.

Greenberg, K., Zheng, R., Gardner, M., **Orr, M.** (2020). Individual differences in visuospatial working memory capacity influence the modality effect. *Journal of Computer Assisted Learning*.

Poitras, E., Butcher, K.R., **Orr, M.**, Hudson, M., Larson, M. (2019). Predicting student understanding by modeling interactive exploration of evidence during an online science investigation. *Journal of Interactive Learning Environments*.

### CHAPTERS

**Orr M.**, Poitras E., Butcher K.R. (2021) Informal Learning with Extended Reality Environments: Current Trends in Museums, Heritage, and Tourism. In: Geroimenko V. (eds) *Augmented Reality in Tourism, Museums and Heritage*. Springer Series on Cultural Computing. Springer, Cham. [https://doi.org/10.1007/978-3-030-70198-7\\_1](https://doi.org/10.1007/978-3-030-70198-7_1)

Poitras, E., Butcher, K., **Orr, M.** (2020). Modeling interactive behaviors while learning with digitized objects in virtual reality environments. In Zheng, R. (ed.), *Cognitive and affective perspectives on immersive technology*. IGI Global.

### MANUSCRIPTS PENDING PUBLICATION DECISION

Butcher, K.R., **Orr, M.** (in preparation). Learner interactions with 3D objects during learning.

**Orr, M.**, Poitras, E., Butcher, K. (Submitted). Building adaptive scaffolds for inquiry-based learning environments. *Journal of Artificial Intelligence in Education*.

**Orr, M.**, Butcher, K.R. (in preparation). Does Physicality Impact Learner Interactions? Evidence from Tangible and Digital Models.

**Orr, M.**, Butcher, K.R. (in preparation). The Impact of Tangible Materials and Focused Prompts on Learning with 3D Representations.

Butcher, K.R., Hudson, **M.**, **Orr, M.**, Larson, M., & Lane, M. (in preparation). A framework for evaluating students' critical thinking processes during phenomena-based investigations.

## CONFERENCE PAPERS AND POSTERS

Butcher, K. R., Hudson, M. A., Larson, M., **Orr, M.**, Lane, M., Velásquez-Franco, S., Bailey, V. J., Davis, M., Power, M. (2022). Its face is so cute! Engaging students in science investigations using digitized museum specimens. *Proceedings of the 7th International STEM in Education Conference (STEM 2022)*. University of Sydney, Sydney, Australia. November 23-26. University of Sydney. Online

Butcher, K. R., Hudson, M. A., Larson, M., Lane, M., Velásquez-Franco, S., Bailey, V. J., **Orr, M.**, Davis, M., Power, M. (2022). Learning science practices via online research: Investigations with digitized specimens. *Proceedings of the 7th International STEM in Education Conference (STEM 2022)*. University of Sydney, Sydney, Australia. November 23-26. University of Sydney. Online

Butcher, K. R., Larson, M., Power, M., Bailey, V., Hudson, M., **Orr, M.**, & Velásquez-Franco, S. (2021, July). EPIC Bioscience: An online learning environment for biodiversity investigations using digitized specimens from scientific collections. Poster accepted for STEM 2021 Virtual Conference, July 5-9, 2021. Online.

Butcher, K. R., Larson, M., & **Orr, M.** (2020, November). Authentic inquiry with digitized museum objects. Poster presented at the International Society for Technology in Education Virtual Conference (ISTE 2020), November 29-December 5, 2020. Online.

Butcher, K. R., Larson, M., Power, M., Bailey, V., Hudson, **M.**, **Orr, M.**, & Velásquez-Franco, S. (2020, July). EPIC Bioscience: An online learning environment for biodiversity investigations using digitized specimens

from scientific collections. Poster presented at the STEM 2020 Conference, July 9-11, 2020. Vancouver, BC.

Butcher, K. R., Larson, M., & **Orr, M.** (2020, June). Authentic inquiry with digitized museum objects. Poster presented at the International Society for Technology in Education Conference (ISTE 2020). June 28-July 1, 2020. Anaheim, CA.

**Orr, M.**, Butcher, K. R., & Larson, M. (2020). Can instructional prompts support effective learner behaviors with tangible and digital 3D objects? Poster presented at the International Conference of the Learning Sciences (ICLS 2020). June 19-23, 2020. Nashville, TN.

Larson, M., Butcher, K. R., & **Orr, M.** (2020, May). Leveraging digitized collections for learning: EPIC Bioscience. Poster presented at the American Alliance of Museums Annual Meeting (AAM 2020). May 17-20, 2020. San Francisco, CA.

**Orr, M.**, Butcher, K. R., Larson, M., Power, M. J. (2020, April). Perceptions of Authenticity in 3D Objects for Science Education: Evidence from 3D Prints of Fossils. Paper presented at the American Educational Research Association Annual Meeting (AERA 2020). San Francisco, CA.

**Orr, M.**, Aina, D., Butcher, K. R., Poitras, E. (2020). Embodied learning with virtual reality: gesture clustering and forecasting. Paper presented at the American Educational Research Association Annual Meeting (AERA 2020). San Francisco, CA.

Butcher, K. R., **Orr, M.**, Hudson, M., Larson, M., Power, M. J. (2020, April). A Cognitive Process Framework for Critical Thinking Applied to Evaluation and Design of Science Investigations. Paper presented at the American Educational Research Association Annual Meeting (AERA 2020). San Francisco, CA.

**Orr, M.**, Poitras, E., Butcher, K.R. (2019, April). Evolutionary Algorithm Optimization of Interactive Factors in Inquiry-Based Learning Environments. Paper presented at the American Educational Research Association Annual Meeting (AERA 2019). Toronto, CA.

**Orr, M.**, Butcher, K. R., Davies, S. (2019, April). Does Physicality Impact Learner Interactions? Evidence from Tangible and Digital Models. Paper presented at the American Educational Research Association Annual Meeting (AERA 2019). Toronto, CA.

Poitras, E., Butcher, K. R., **Orr, M.**, & Hudson, M. (2019, April). Modeling student interactions with an online map to predict differentiated

understanding of scientific observations in an inquiry-based learning environment. Paper presented at the American Educational Research Association Annual Meeting (AERA 2019). Toronto, CA.

**Orr, M.,** Butcher, K. R. (2018, April). Do erroneous explanations hinder learning? Evidence from physics. Paper presented at the American Educational Research Association Annual Meeting (AERA 2018). New York, NY.

**Orr, M.,** Butcher, K. R., & Verma, S. (2017, April). Multimedia materials for patient education increase confidence and explanation quality. Paper presented at the American Educational Research Association Annual Meeting (AERA 2017). San Antonio, TX.