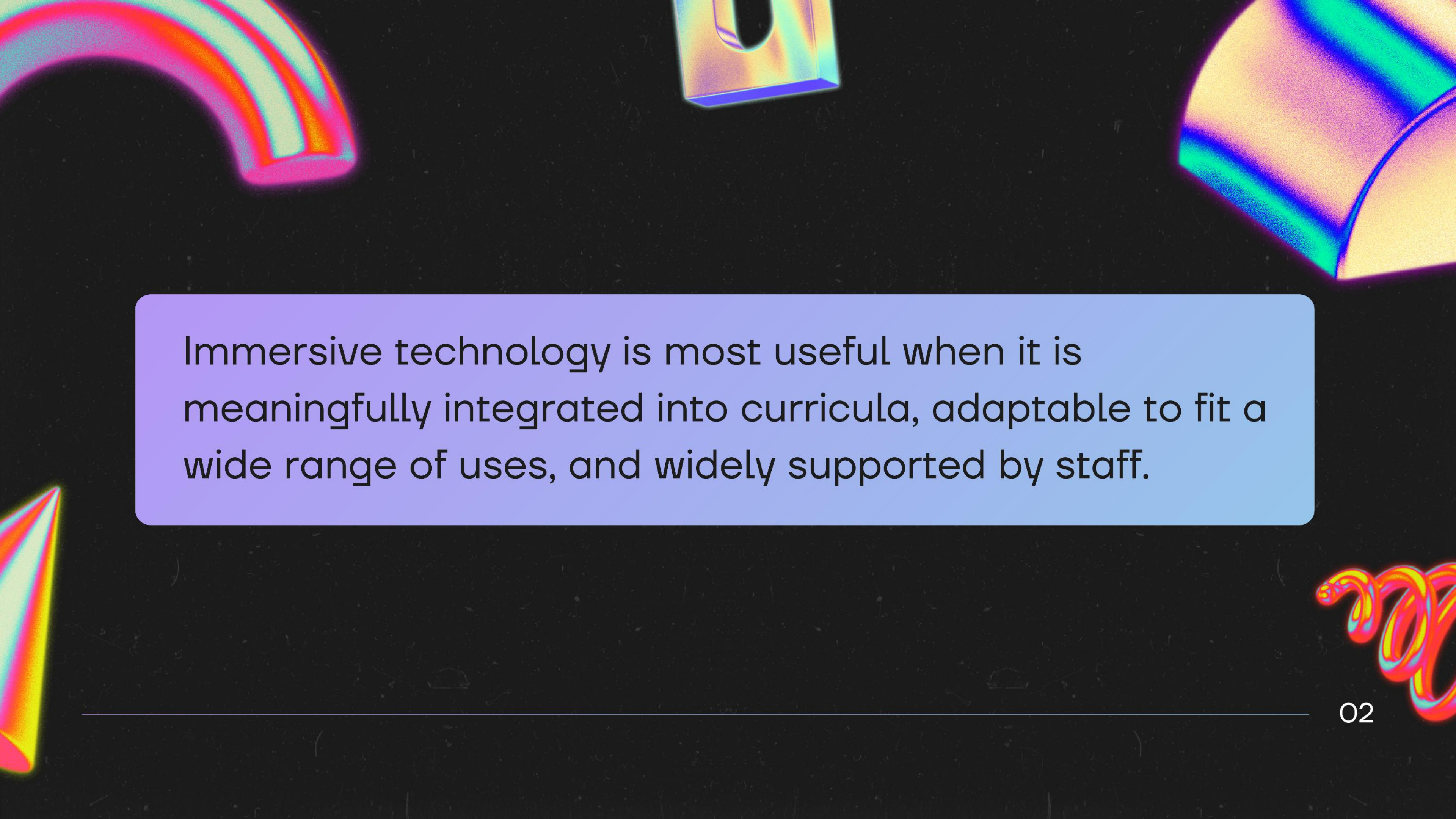


LOEX 2024

# IMMERSIVE TECHNOLOGY NEEDS PEDAGOGY

Hannah Rainey and Hiva Kadivar  
North Carolina State University





Immersive technology is most useful when it is meaningfully integrated into curricula, adaptable to fit a wide range of uses, and widely supported by staff.

# LIST OF CONTENTS

↙ IMMERSIVE TECH IN HIGHER ED + LIBRARIES

↙ IMMERSIVE LEARNING

↙ THE VISUALIZATION GALLERY

↙ OUR SERVICE MODEL

↙ EXEMPLARY USES OF IMMERSIVE TECH IN INSTRUCTION

↙ TAKEAWAYS & FUTURE DIRECTIONS

# ABOUT US



## **Hannah Rainey**

(she/her)

Associate Head, Research Engagement  
NC State University Libraries

- Biracial – Korean & White
- Raised in Idaho
- Star Trek fan



## **Hiva Kadivar**

(she/her)

Libraries Fellow

NC State University Libraries

- Gen 1.5 Iranian American
- Raised in Tehran
- Mixed media visual artist

# PAIR & SHARE

- What do you think of when you hear “immersive technology”?
- When was the last time you felt immersed in something?

# IMMERSIVE TECHNOLOGY IN HIGHER ED & LIBRARIES



Usually defined by hardware:

- Head-mounted virtual reality (VR)
- CAVEs (cave automatic virtual environments)
- Large-scale visualization spaces

Challenges:

- Expensive
- Inaccessible and unapproachable
- Time-consuming

# IMMERSIVE LEARNING IN HIGHER ED & LIBRARIES

“Learning does not depend solely on the technology, but on its overall context and method of use; and it is not neutral nor unidirectional, since technology both changes and is changed by its adoption” (Beck et al., 2021)



Drawing from Beck et al.'s research in “Towards an Immersive Learning Knowledge Tree—A Conceptual Framework for Mapping Knowledge and Tools in the Field” (2021):

### **Immersion**

- “an attribute, quality, or characteristic of a technological system” and a “response to being surrounded or submerged”
- a psychological phenomenon created by narratives, as in a book, or a state of flow

### **Immersive Learning**

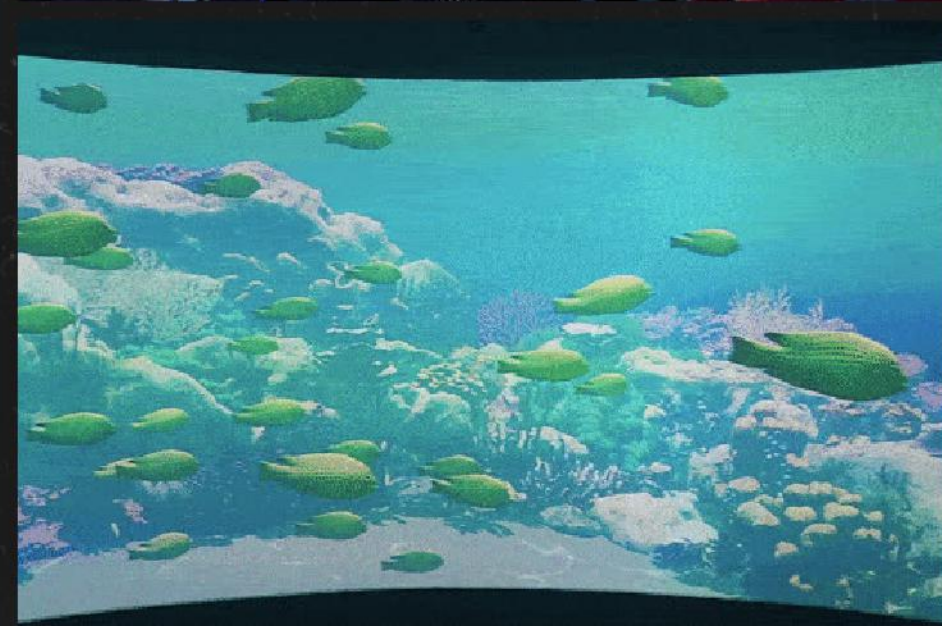
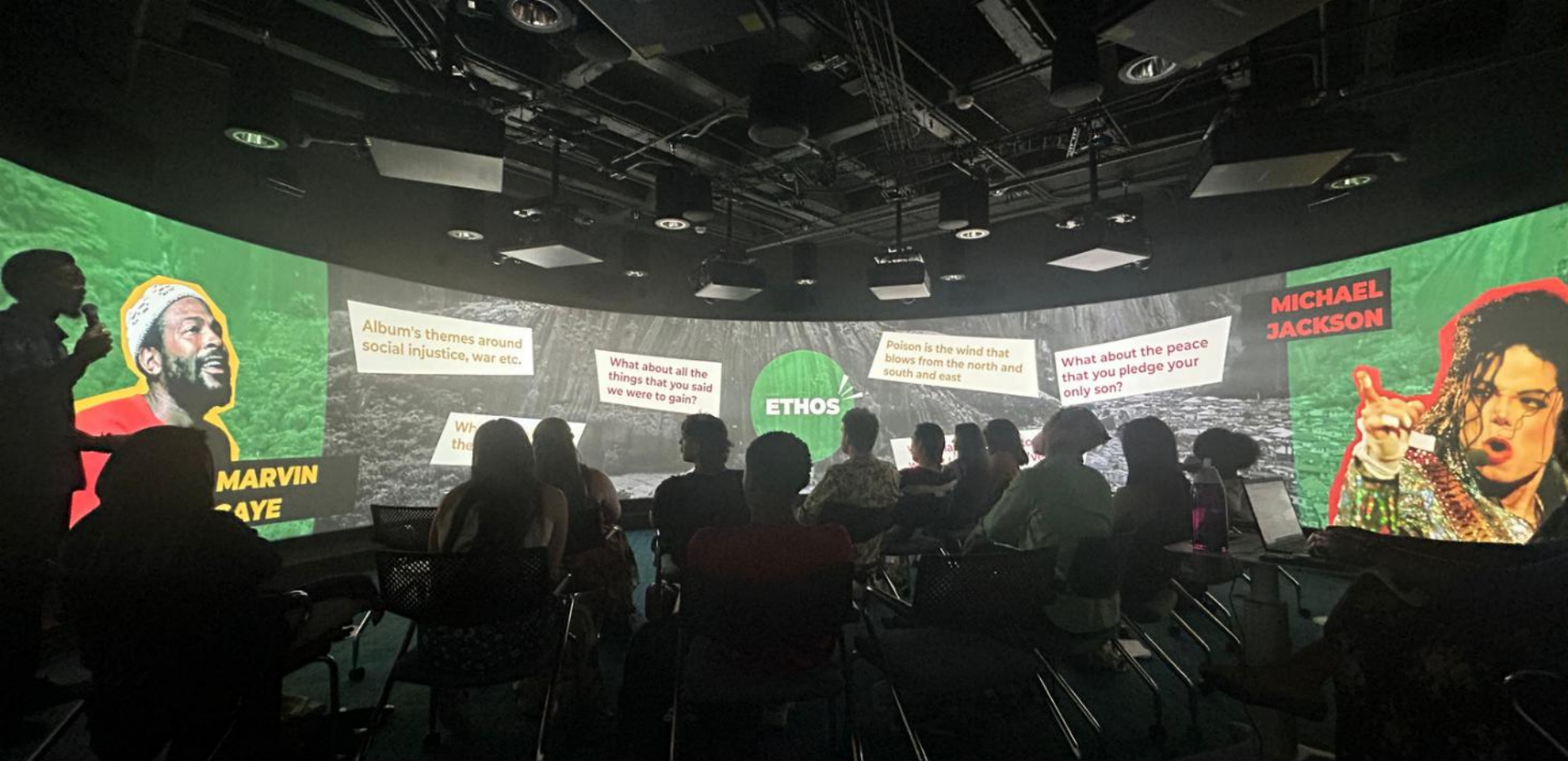
- the mutual relationship between the medium and the “learners’ perception and cognitive processes”



# ABOUT THE CYMA RUBIN VISUALIZATION GALLERY

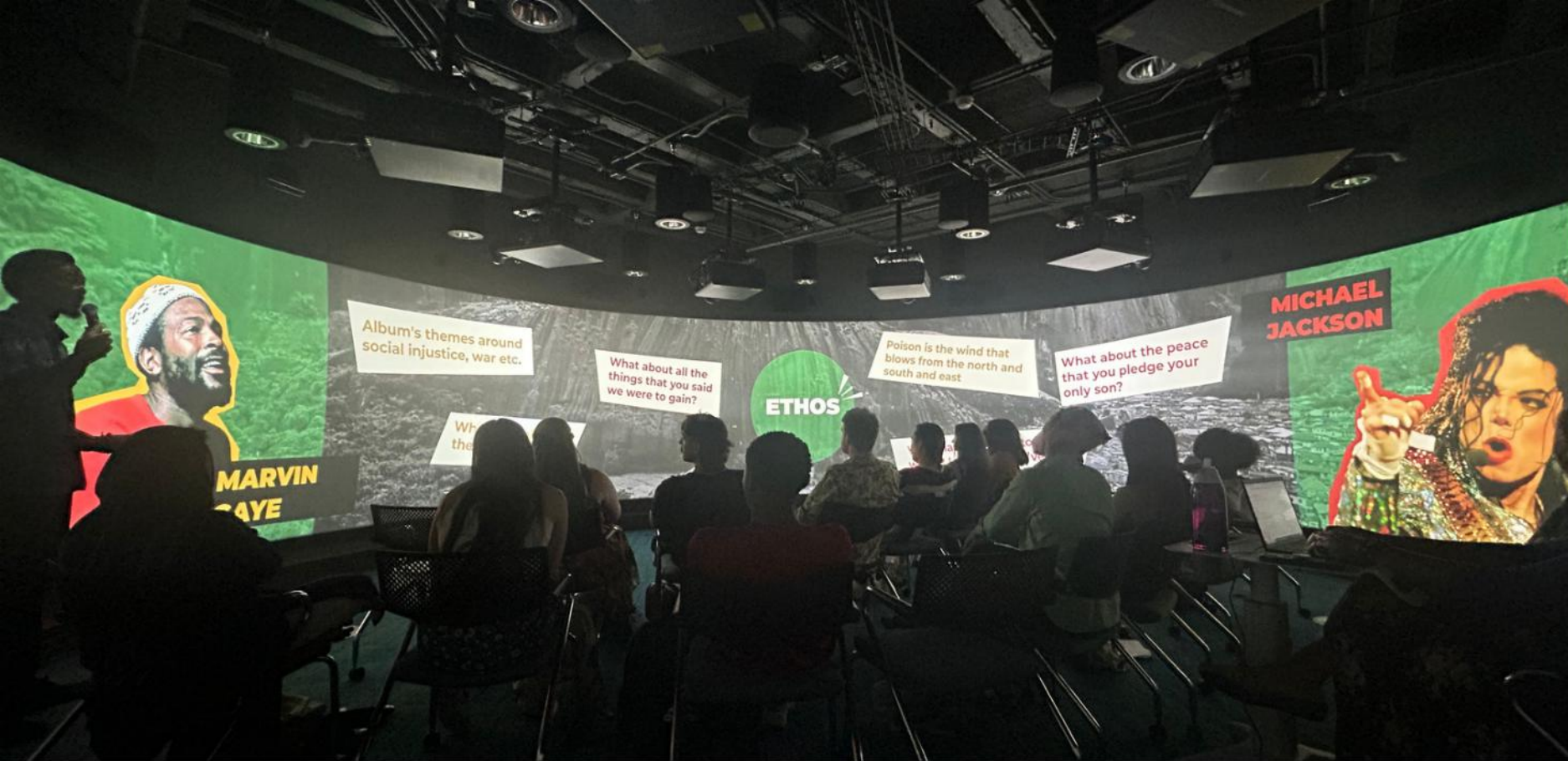
- One-of-a-kind immersive environment at NC State University Libraries
- Eight high-definition projectors presenting a seamlessly blended view of content in 15,360 x 1080 pixels
- Supports any Windows-compatible application, providing numerous options for content creation



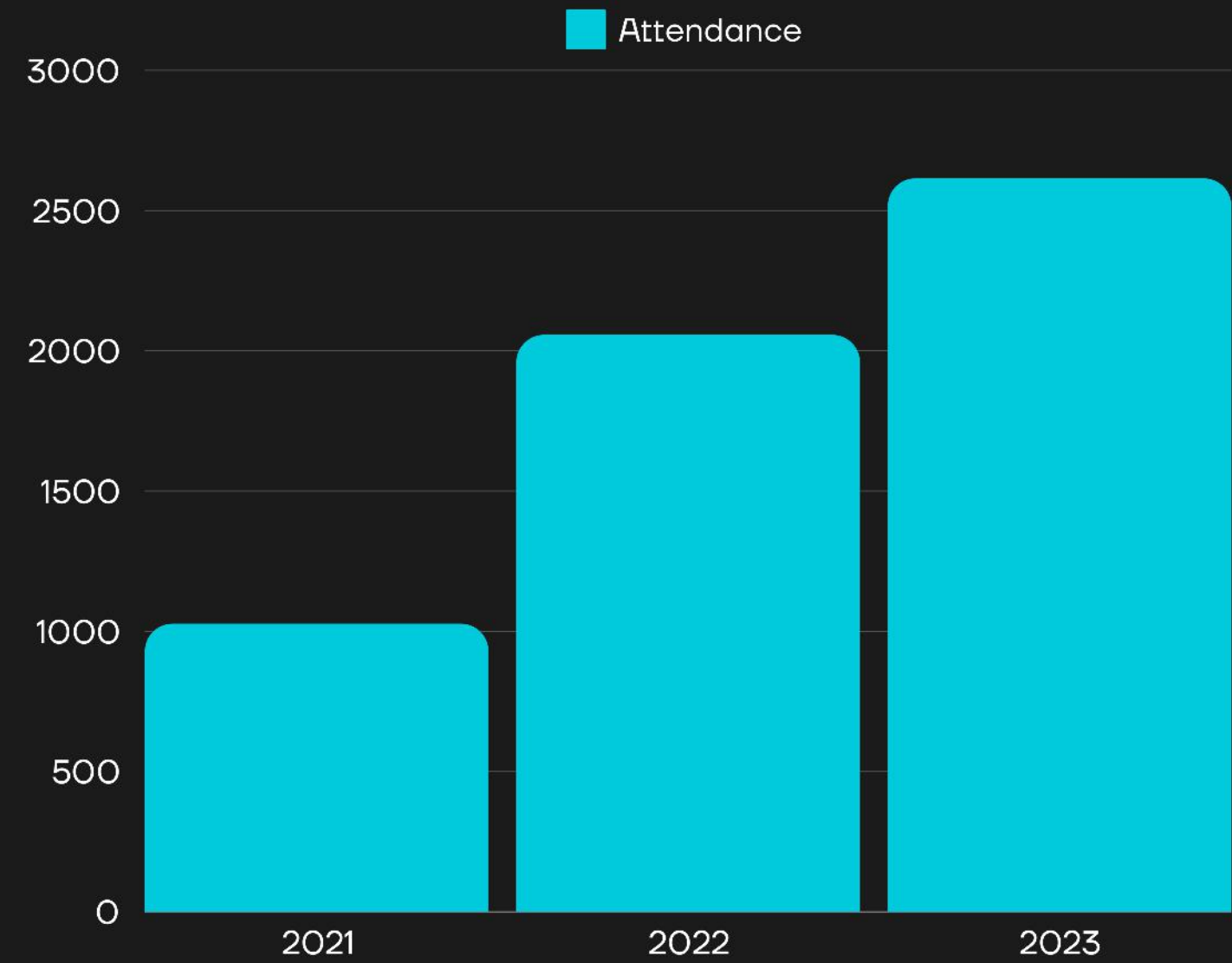
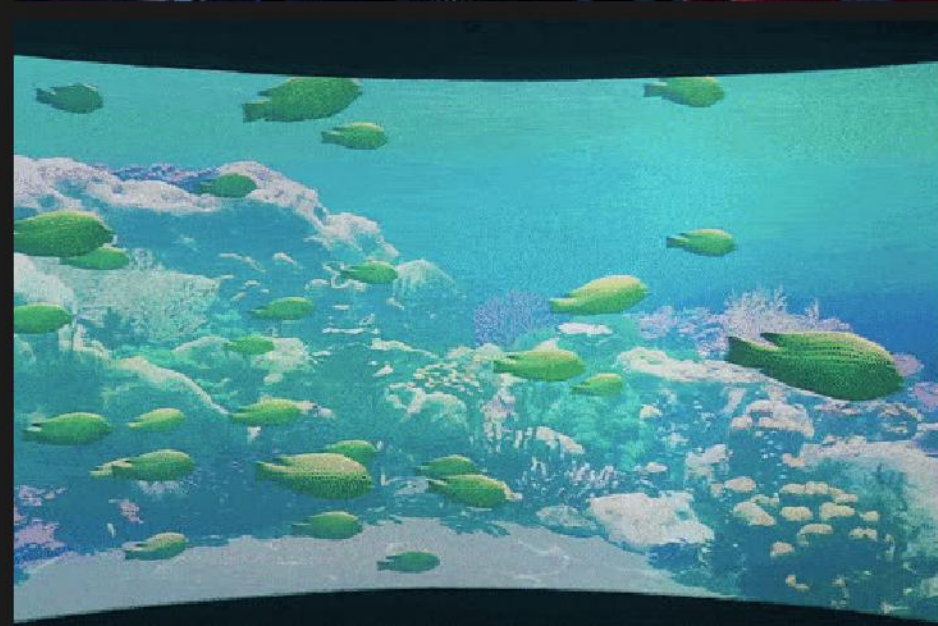


# VISUALIZATION GALLERY USES

- ↙ HIGH-IMPACT LEARNING ACTIVITIES
- ↙ ROOM-SCALE VR EXPERIENCES
- ↙ CREATIVE DIGITAL MEDIA PROJECTS



# VISUALIZATION GALLERY



# OUR **SERVICE MODEL**

Centers relationship building and collaboration:

- Cross-departmental team of librarians, technicians and developers
- Comprehensive support for users: logistical, technical, design, and pedagogical
- One-on-one consultations to ideate, develop, test, and deliver projects

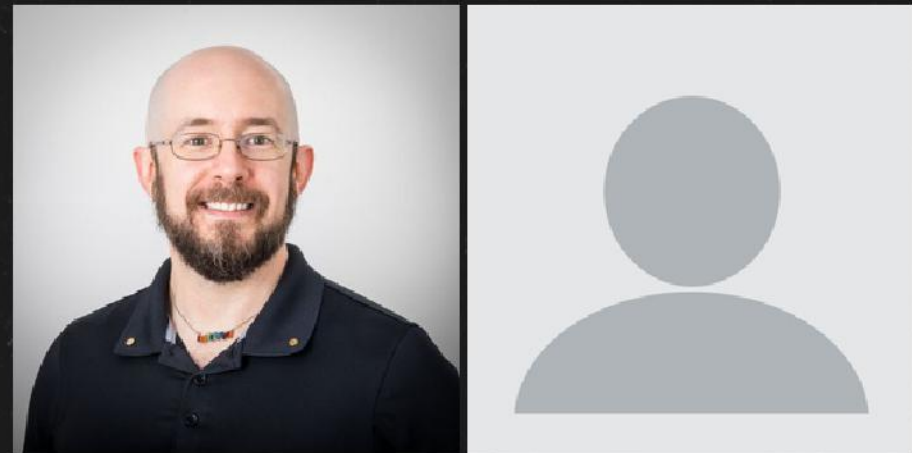
# HIGH TECH SPACES TEAM



Information Technology



Research Engagement



Digital Library Initiatives



Learning Spaces & Services

and many many more contributors...

# OUR MOTIVATION

“It is important to look beyond the ‘wow’ factor of dynamic visualizations for instruction. If instructional support and learning processes are not emphasized, even the latest technological advancements may have limited instructive value” (Makransky & Peterson, 2021)



# GUIDING FRAMEWORKS



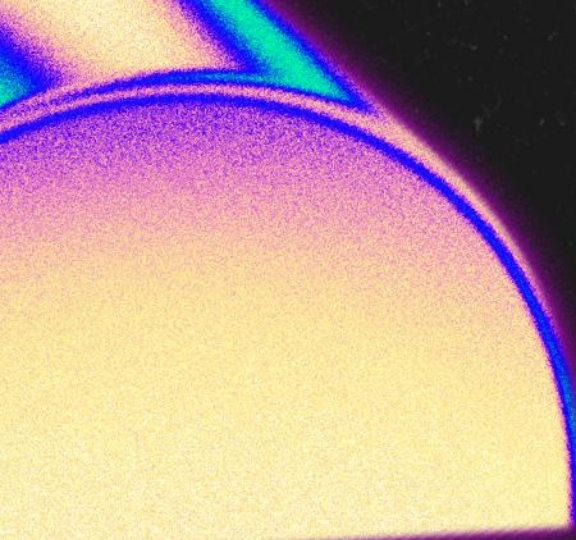
## ↳ COGNITIVE AFFECTIVE MODEL OF IMMERSIVE LEARNING

foundational vocabulary and guidelines for understanding and co-creating meaningful learning experiences within our immersive spaces

## ↳ CRITICAL & FEMINIST PEDAGOGIES



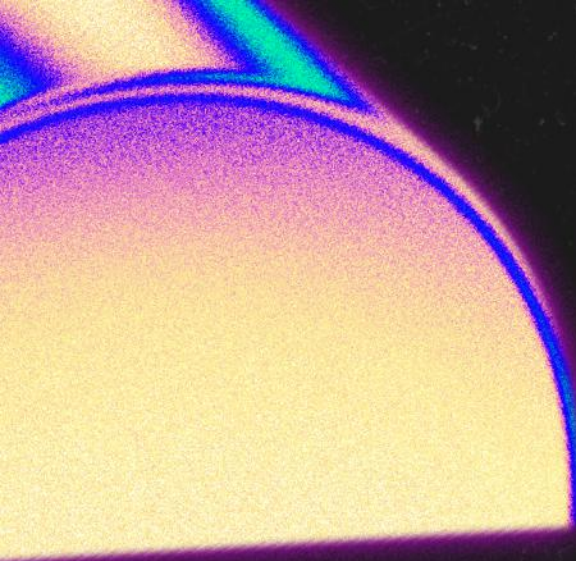
rendering the immersive learning experience transformative for all involved, including us



## COGNITIVE AFFECTIVE MODEL OF IMMERSIVE LEARNING (CAMIL)

- Guido Makransky and Gustav Peterson
- **Presence** and **Agency** as the unique affordances of immersive technology
- Contributing to six cognitive and psychological factors of: interest, motivation, self-efficacy, embodiment, cognitive load, self-regulation
- Instructional methods that facilitate these affordances lead to greater knowledge transfer





ENACTING  
CAMIL  
THROUGH  
**CRITICAL &  
FEMINIST  
PEDAGOGIES**

- Paulo Freire’s critical pedagogy: embracing the learner as “an active participant, not a passive consumer”
- bell hooks’ feminist ethics of care and engaged pedagogy: instructors and students “actively committed to a process of self-actualization”

# EXEMPLARY USES OF IMMERSIVE TECH IN INSTRUCTION

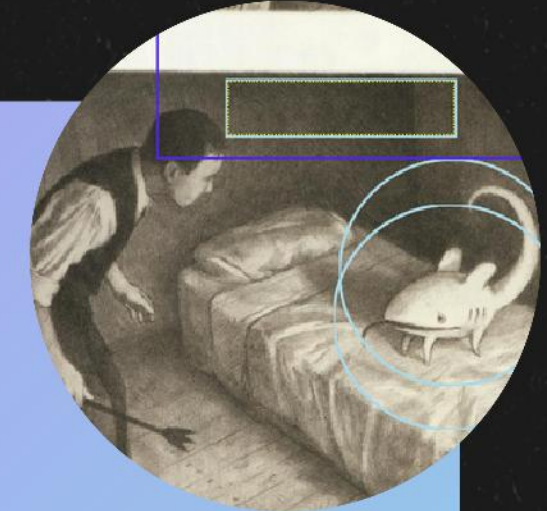
## THE VMLK PROJECT + COLLECTIVE VR

in a public speaking course



## DIGITAL ANNOTATIONS

in an English course



## CRITICAL MEDIA MAKING SHOWCASE

in a Communications course



# The vMLK Project



- NEH-funded digital humanities project recreating Dr. King's "Fill up the Jails" speech originally delivered in Durham, NC in 1960
- Led by Dr. Victoria Gallagher (Communications) with Co-PI's: Dr. Keon Pettaway (Communications) & Dr. Derek Ham (Design)
- Collaboration with graduate student assistants, library staff, community
- "Kit of parts" :
  - Audio recordings
  - Short documentaries
  - PC and head-mounted VR
  - Collective VR





# Collective VR

*Presence | Social Presence |  
Embodiment*

“The intention is to connect students to each other through the feeling of being together sharing this important moment; this is a collective VR experience that stands in contrast to the (potentially) immersive isolation of experiencing VR in individual headsets.”

*-Gallagher et al. (2023)*



# vMLK

## in a Public Speaking Course

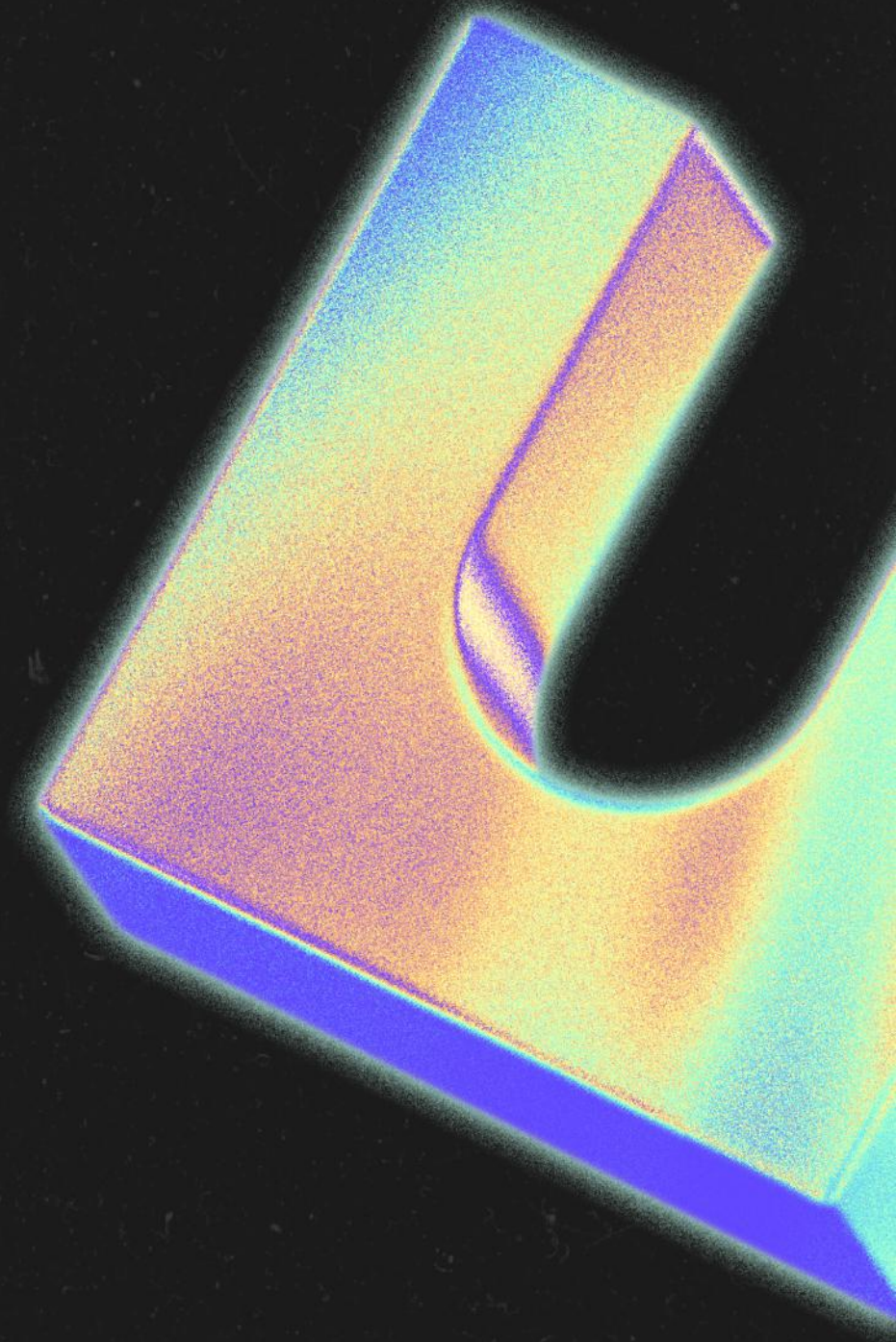
- Introduced to students between the persuasive and advocacy speech units
- Prior to the experience:
  - Students view 2 brief documentaries providing the historic and scholarly context
  - Students read the text of the speech
- After the experience:
  - Immediate reflection through Padlet
  - End of unit survey

“...having high prior knowledge enables the affordances of presence and agency to be conducive to learning by allowing learners to interpret their experiences in the IVR lesson in a meaningful way.”

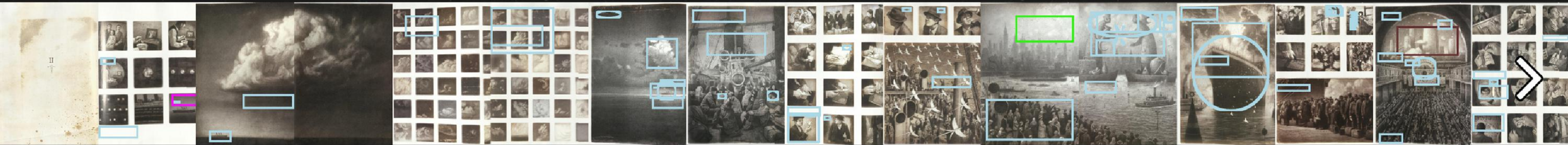
-Makransky & Petersen

# PAIR & SHARE

How might you incorporate *presence* and *embodiment* into instruction with or without immersive technology?



# Digital Annotations



- Dr. Margaret Simon's course on Gender and Race in the Global Graphic Novel
- Students are surrounded by scanned pages of *The Arrival* by Shaun Tan, a wordless graphic novel that depicts an otherworldly yet familiar immigrant story
- Annotate - open source annotation platform



# Negotiated Reading in the Immersive Environment



*Presence | Agency*

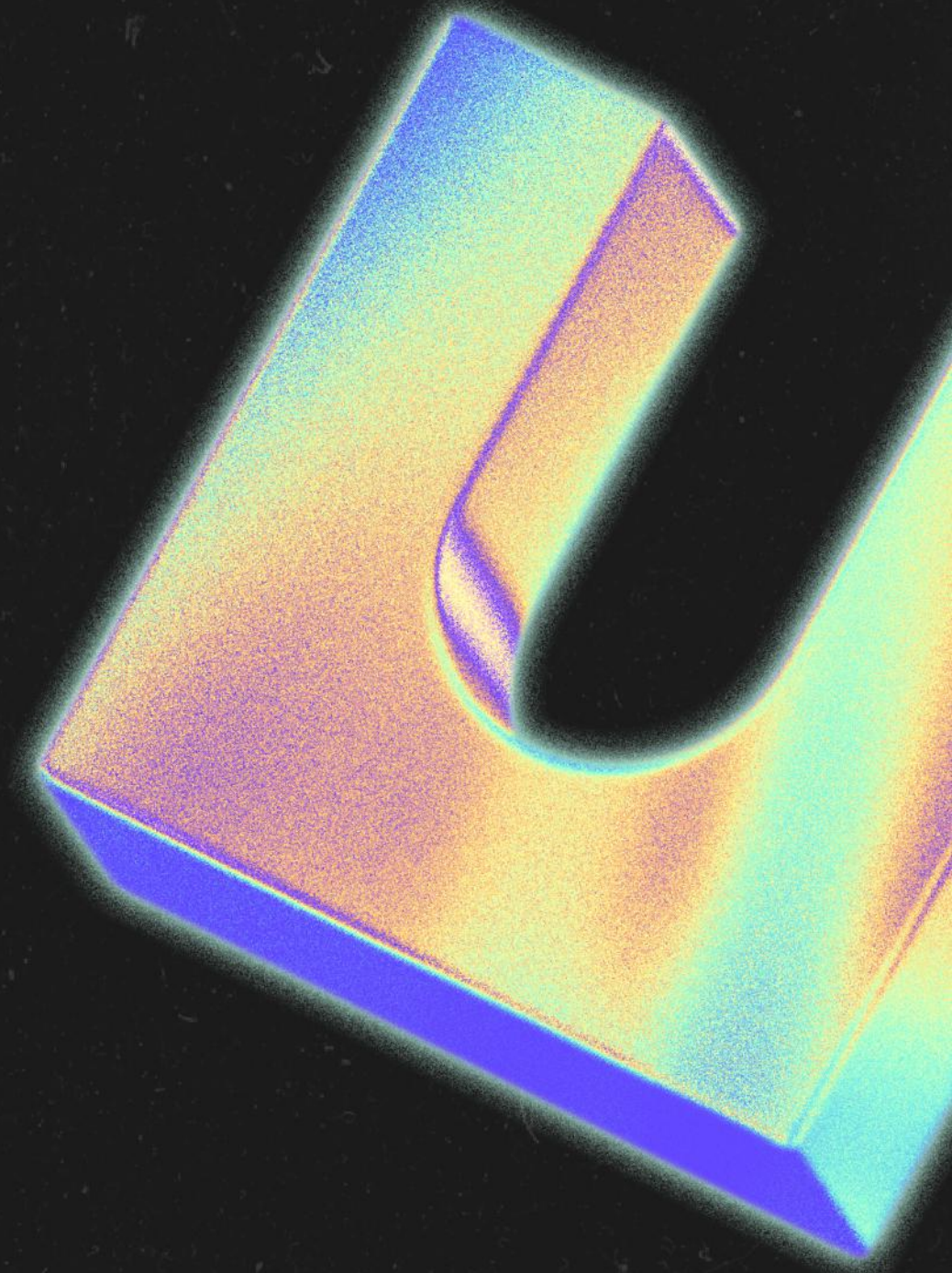
“discovering an affinity with aspects of the characters and stories, and actively creating a discourse with identity and positionality”

-Allen & Simon (2022)

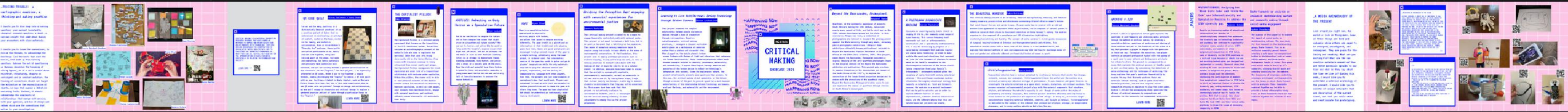


# PAIR & SHARE

How might you incorporate *agency* into your instruction with or without immersive technology?



# Critical Media Making Showcase



- Dr. Fernanda Duarte's Critical Media Making course
- Students actualize their agency by becoming makers of immersive learning experiences



# Critical and Feminist Making

Students create prototypes of “speculative media objects as a way to challenge normative frameworks, imagine equitable realities, and exercise critique”

-Duarte (2023)



# From Users to Critical Makers

## *Agency | Self-efficacy*

- Students create immersive presentations using Google Slides
- Meet with library staff throughout the semester
- These students are primed to engage and speculate with the immersive technology



# From Users to Critical Makers

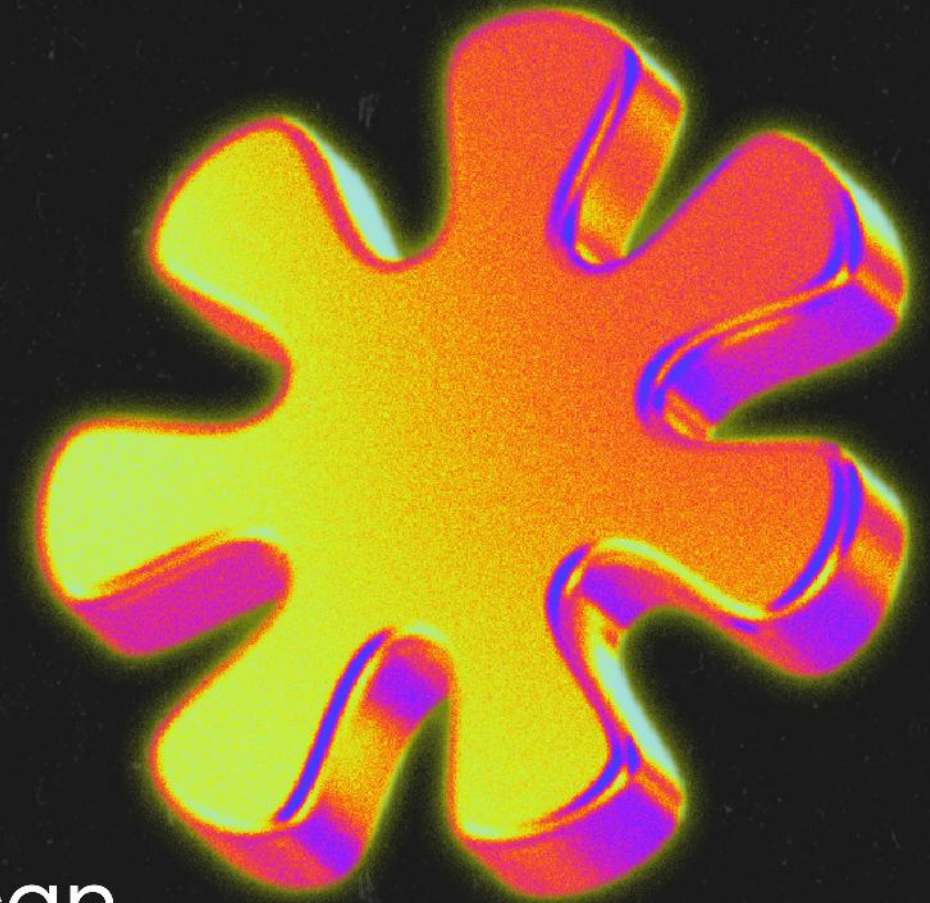


- Students create content for the Gallery outside of the context of courses:
  - Dissertation defenses
  - Creative multimedia projects
  - Immersive games
- Validation that the technology is useful for students



# TAKEAWAYS

- Immersive technology is more meaningful when embedded in curriculum
- Experiencing immersive technology as a group can positively impact learning
- Critical pedagogies facilitate student agency
- Relationships > Technology



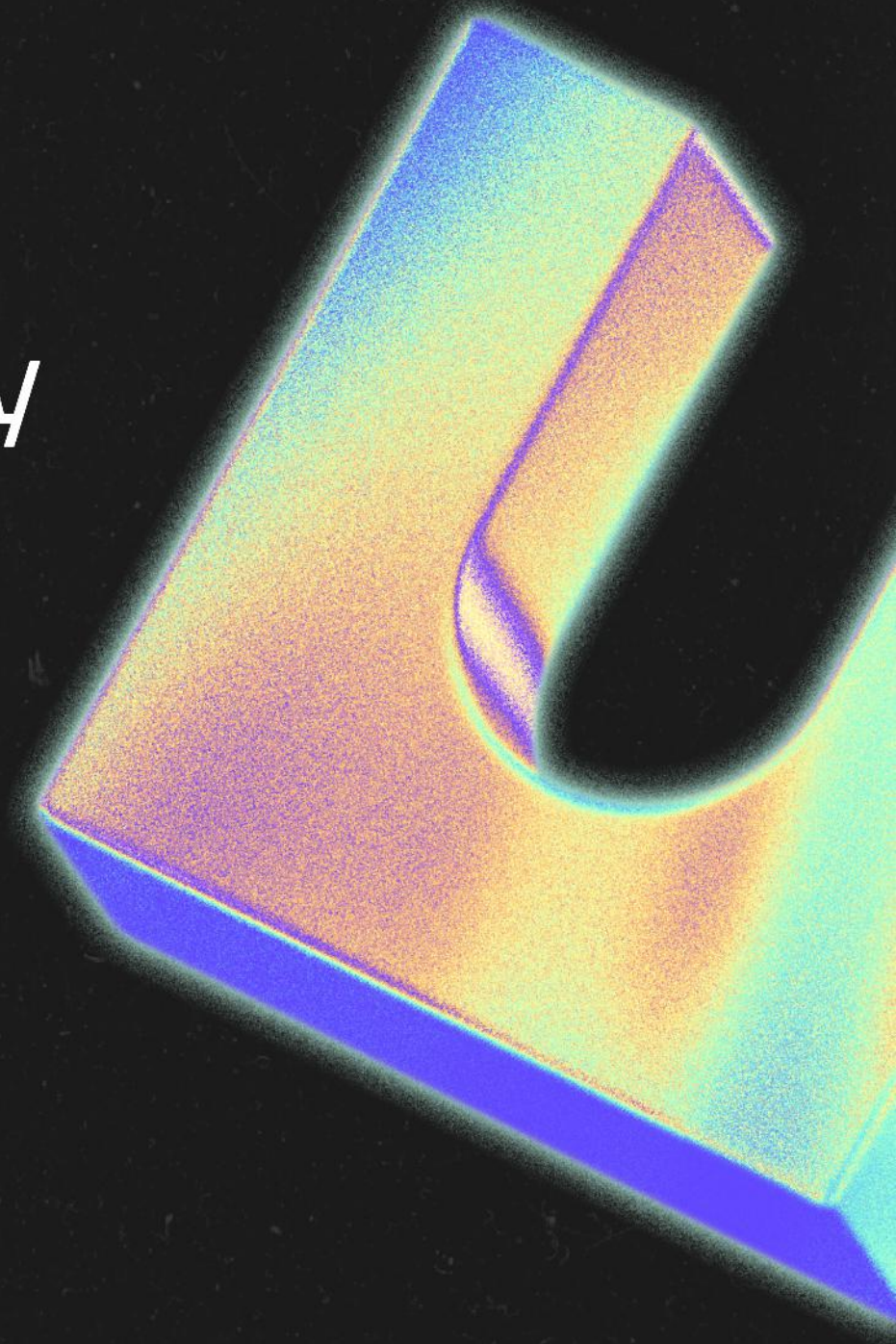


# FUTURE DIRECTIONS

- Potential empirical studies to better understand the impact of the Visualization Gallery and deepen faculty collaborations
- Workshops for instructors that combine hands-on technology instruction with theoretical grounding in CAMIL
- Investigate accessibility
- Explore ways of utilizing immersive technology for other types of library instruction

# DISCUSSION

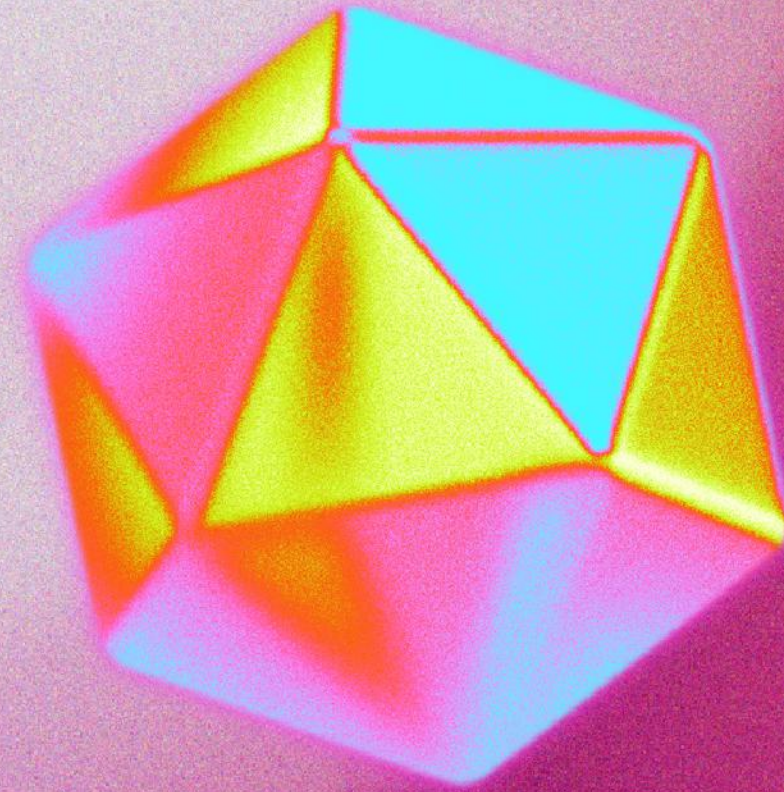
How can we integrate immersive technology into library instruction in ways that facilitate *presence* and *agency*?







LOEX 2024



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# THANK YOU



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