zSpace: Transforming teaching and learning with mixed reality

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Introduction

zSpace is a mixed reality computer that allows users to "pull" 3D objects or concepts from the screen and manipulate them with a stylus.

The U.S. Department of Education (2017) states in its 2017 National Education Technology Plan that zSpace Technology represents one of the future technologies that has potential for transforming future learning experience.

Accessibility

Accessibility standards are embedded within the zSpace educational software (zSpace, 2014):

Audio options available
Compatible with commonly used screen readers
Keyboard shortcuts
Available in English, Spanish, Chinese, and French
Additional cues for users who are color-blind
Handedness configuration
Stylus vibration (ie: heartbeat)

3D Scanning & Printing

A 3D model can be created in zSpace and printed on a 3D printer or a physical object can be scanned with a 3D scanner, uploaded into zSpace, manipulated, and then 3D printed, for example:

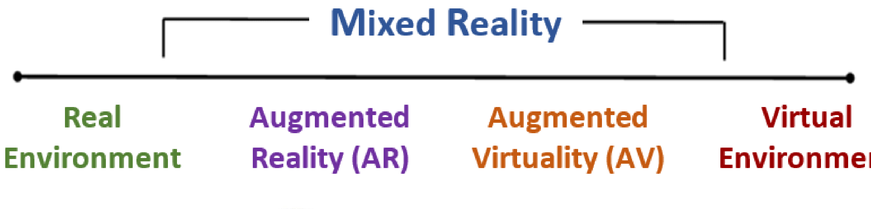
- CT scan
- Historical artifacts
- Body parts (head, hands)
- Objects (snake skeleton, car parts)

What is Mixed Reality?

Augmented Reality (AR): Uses a device to add digital elements to the real world. (Pokémon Go and Snapchat).

Virtual Reality (VR): A fully immersive virtual experience (Oculus Rift).

Mixed Reality (MR): Combines elements of AR and VR where real and digital worlds interact.



Discipline Specific Instruction

zSpace can meet the needs of courses across a wide variety of disciplines:

Medicine: anatomy models (muscular, nervous)
Engineering: engines, machineries, string of lights
Biology: biomes, leaf structure, photosynthesis
Chemistry: molecules, atoms, chemical reactions
Mathematics: geometry, graphing, volume
Music: idiophones, musical ensemble
Language & Literature: dramatic structure, prefixes
Social Sciences and History: Hammurabi's Code
Multimedia Production: MR instructional activities

Workshops

Workshops will be offered at four levels:
Explanatory: basic introduction
Application: in-depth exploration of content/discipline specific apps
Implementation: conceptual solutions with best practices focused on the implementation of MR in the class to support experiential learning
Creation: content design and development

zView Camera

zView camera will allow participants in classes or workshops the capability to view the multimedia instructional materials.

Assessment

The impact of zSpace in the library will be measured based on data collection of device usage, post-use surveys, semi-structured interviews, and workshop evaluations. A new educational technology course plans to conduct an pedagogical needs assessment using zSpace.

References

U.S. Department of Education (2017). Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update. Retrieved from https://cdn.zspace.com/collateral/casestudies/2017_National_Technology_Plan.pdf

zSpace (2014). User interface guidelines. Retrieved from https://cdn.zspace.com/downloads/documentation/developer/zspace-ui-guidelines.pdf