AnatomyX

The Augmented Reality Anatomy Lab and Learning Platform
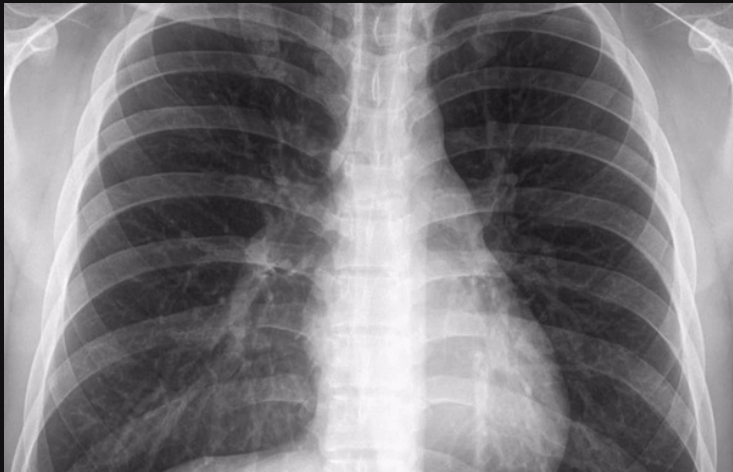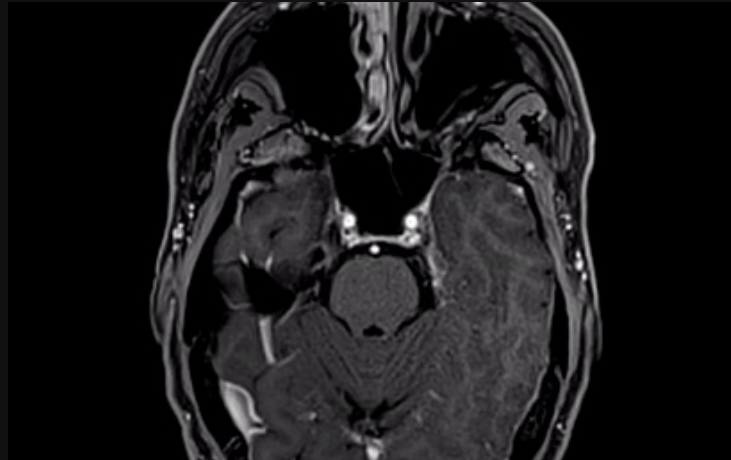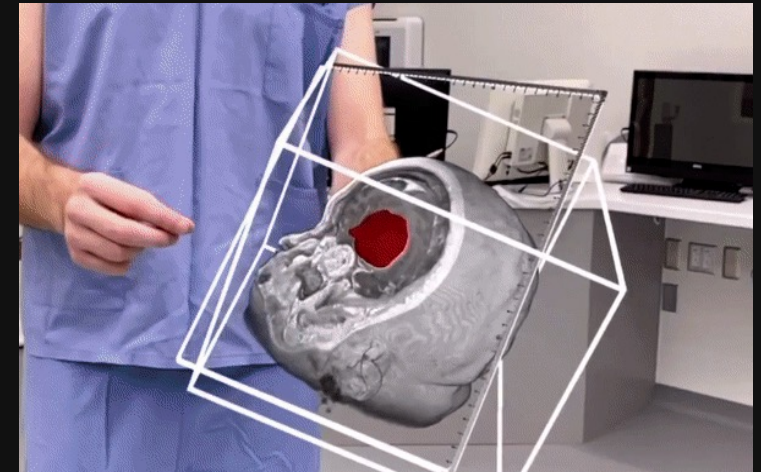
Human Anatomy & Physiology Education in 2021

Anatomy is the core discipline of all health and life sciences, but it's expensive and complicated to deliver effectively for students.

Traditional labs cost $210K to $1.9M, and require significant maintenance.[1]

Cadavers, Air handling system (HVAC, vents, embalming pump), toxic chemicals (formaldehyde), cleaning supplies, dissection tables, remains bins, wall cabinets, sinks, eyewash stations, etc.
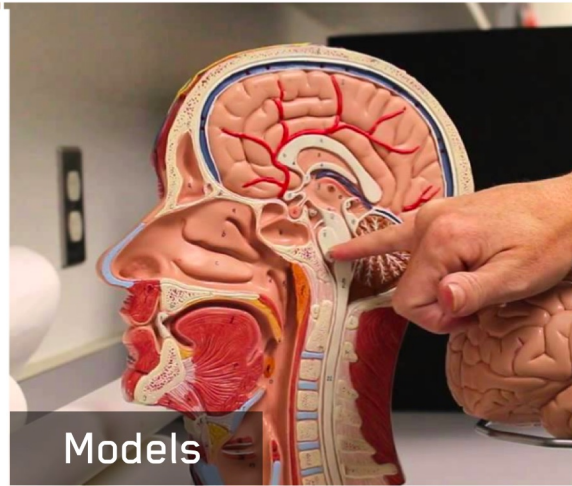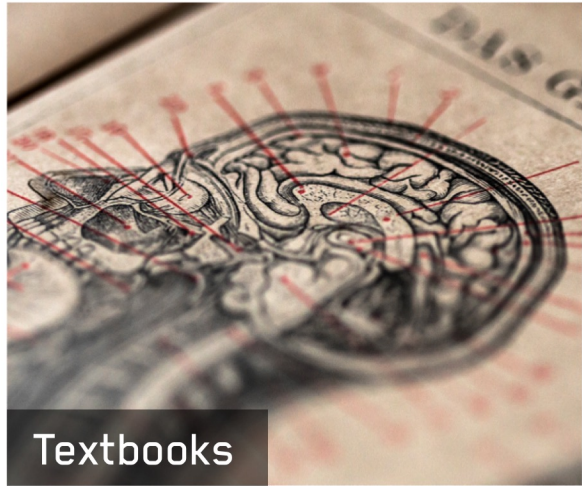

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Past Strategies and the Augmented Reality Opportunity

Peer-Reviewed Impact Analysis of Immersive Learning Solutions

Immersive technologies are becoming more popular and accessible to consumers. This means that we are starting to see their use in a wider variety of settings, including the classroom.

This is a breakthrough development for teachers and students alike. When immersive technologies and game-based learning are deployed in a pedagogically consistent manner, they have the potential to support and expand curriculum, enhancing learning outcomes in ways which haven't been previously possible, affordable or scalable.

Embodied cognition
Digitally immersive experiences enable students to practice and perfect skills in safe and accurate learning environments.[2]

Mastery-focused learning
A growing body of evidence shows that test scores among students using Immersive Technology improved by as much as 22%.[3]

Cognitive load
Augmented Reality reduces information bottlenecks and increases performance on skills-based tasks, resulting in gains in knowledge, abstract reasoning, and critical thinking.[4]

Inclusivity
Augmented Reality allows students to access previously out-of-reach experiences and empowers low achieving students.[5]

Collaboration
Augmented Reality provides settings in which students work collaboratively to enable broader and more personalized access to knowledge.[6]

Diversity
Immersive Technologies are uniquely placed to break through emotional barriers and allow learners to experience life from the perspective of others, building crucial empathy-related skills.[7]

Reduce cognitive load
Enable learners to assimilate complex information in a shorter period of time while also retaining it longer.[8]

Powerful simulations
Simulations allow learners to practice routine situations which would normally be out of reach in real life.[9]

Situated learning
Use of Immersive Technologies can increase rates of skills transfer, enabling students to apply theoretical concepts to real-world scenarios.[10]

Increase retention
Information presented in Mixed Reality is retained more efficiently which improves learning outcomes.[11]
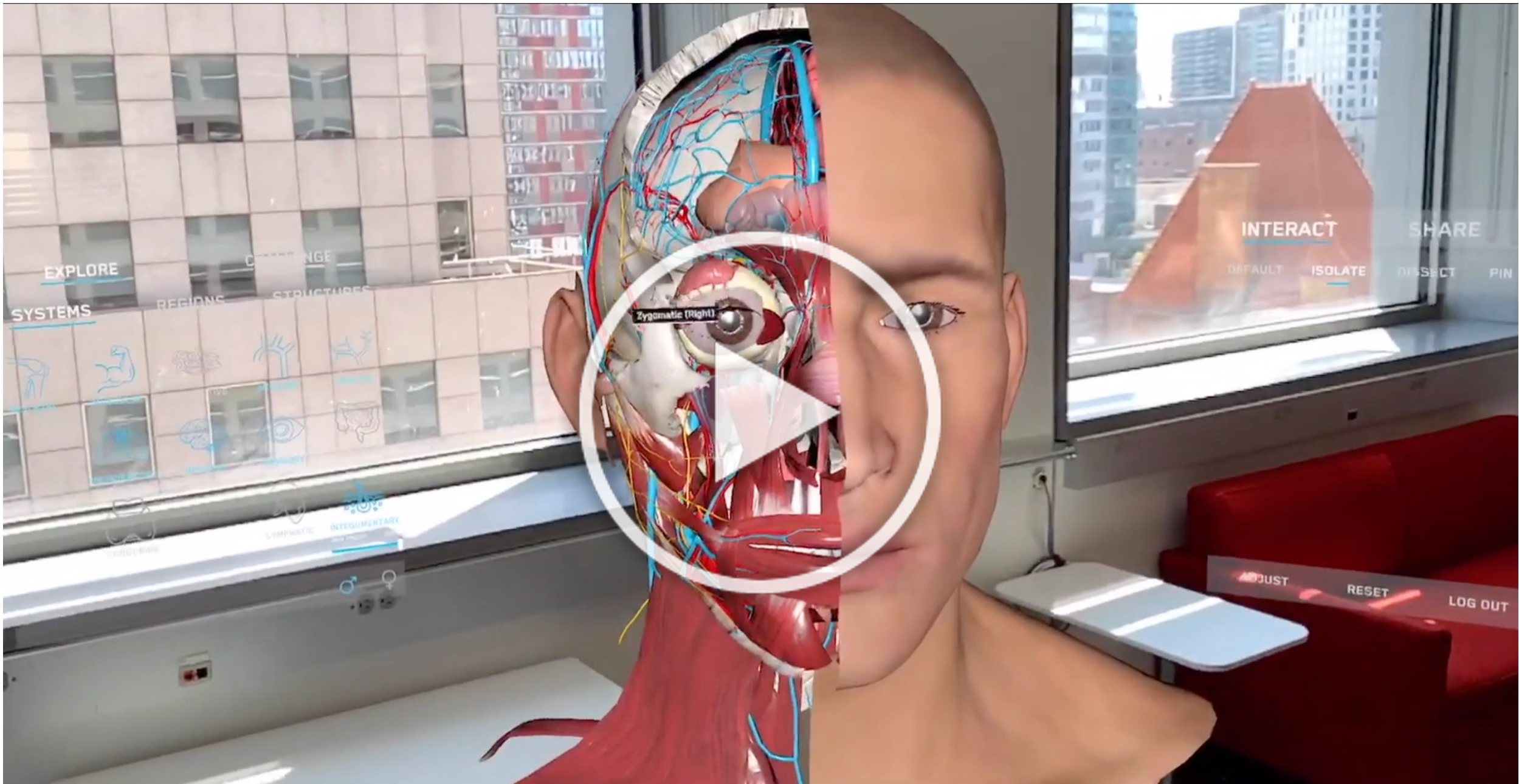
Social emotional learning
Augmented Reality supports collaborative learning modalities in adaptive and creative environments.[12]

Supercharged cognition
Augmented Reality reduces the cognitive load by allowing learners to directly visualize, manipulate, and interact with complex 3D structures.[13]

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EXPLORE
SYSTEMS
C...NGE
REGIONS STRUCTURES

INTERACT   SHARE
DEFAULT   ISOLATE   DISSECT   PIN

Zygomatic (Right)

LYMPHATIC   INTEGUMENTARY

ADJUST   RESET   LOG OUT

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Full-Scale Deployment:

5 campuses, 200+ devices, over 1000+ students

Return-on-Investment:

- **95%** of students report enhanced understanding

- **15%** higher scores on standardized tests

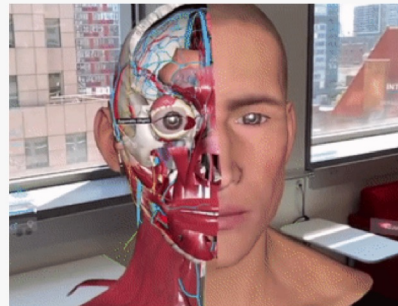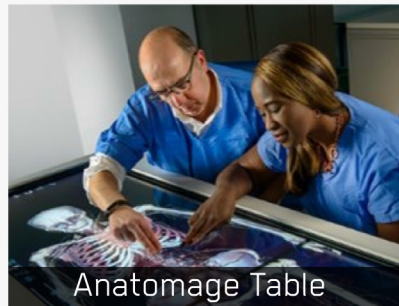- **20%** decrease in the student failure rate

" Augmented reality and AnatomyX will enable future generations of healthcare leaders to learn core principles in a much more efficient, engaging and long-lasting manner.

Segar Annamalai - **CIO, West Coast University**

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Financial Cost Analysis of Immersive Learning Solutions
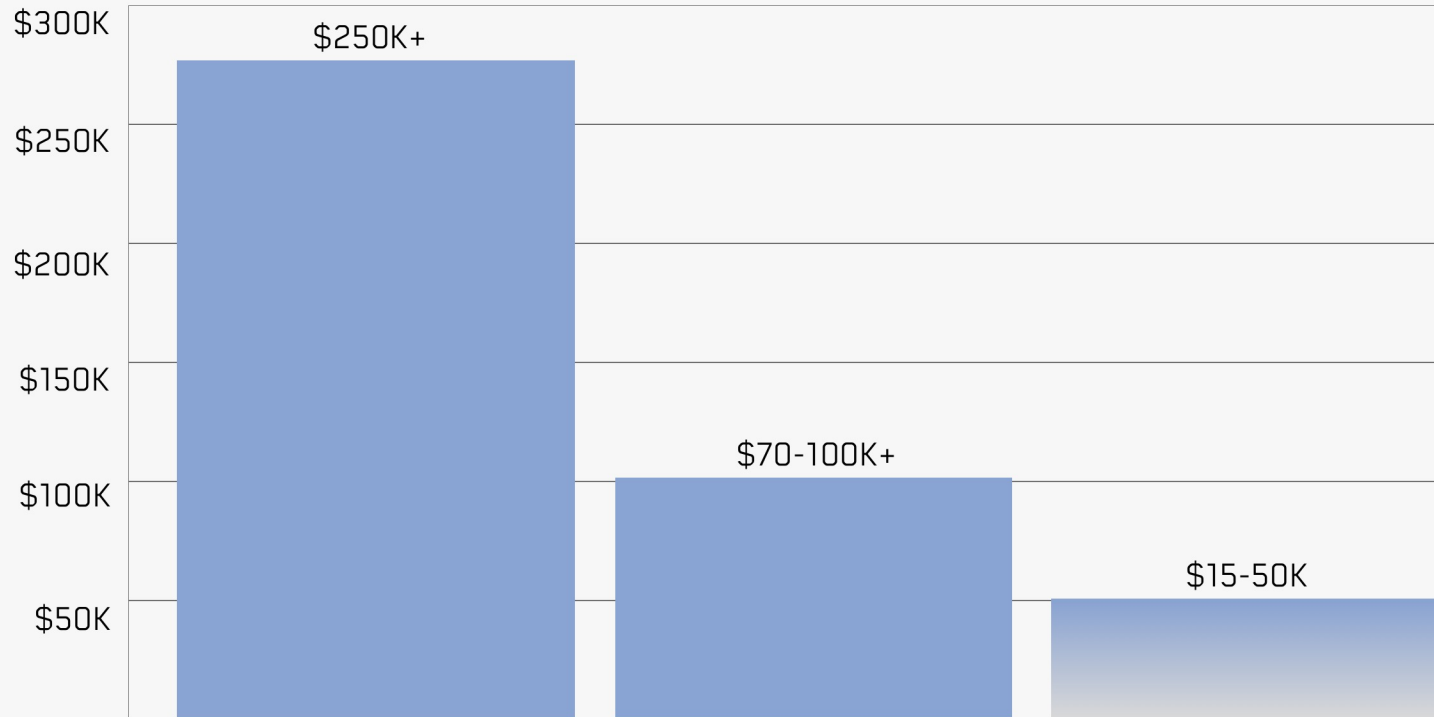
When compared to complex cadaver lab facilities or 2-dimensional table-tops, an investment in augmented reality technology provides unparalled value to any innovative organization.

Augmented Reality is the only technology available that offers remote learning and collaboration for 40+ users simulatenously.

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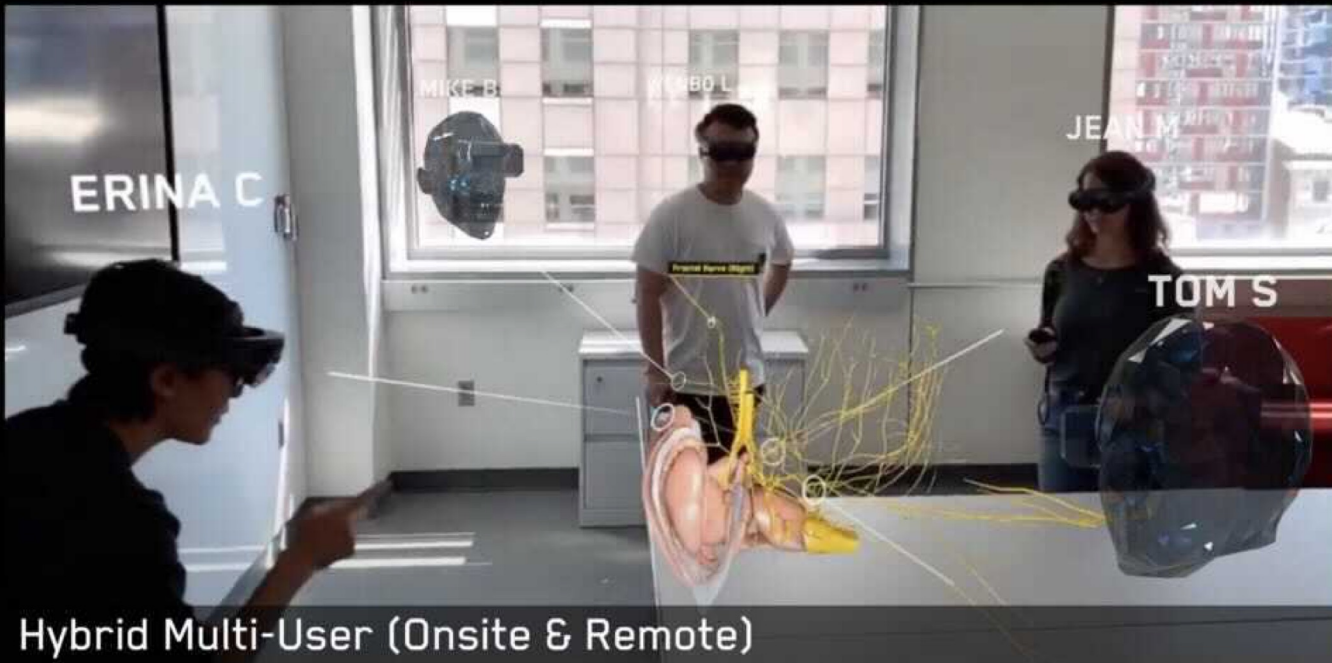
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Superior Engagement: Remote and In-Person Collaboration

Onsite Multi-User

Remote Multi-User

Hybrid Multi-User (Onsite & Remote)

Spatial anchoring holographic content with integrated voice communication transforms any environment into an anatomical laboratory, whether users are in the same room, on the other side of the world, or both, this is the future of remote immersive learning.

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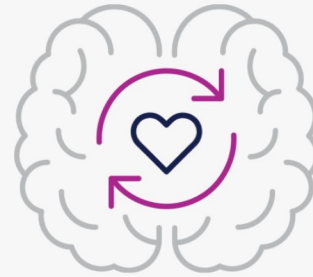# Key Considerations - Launching Your Augmented Reality Journey

Identify your educational "champions"
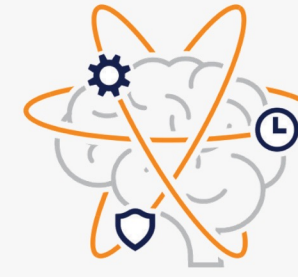
✓ Onboarding Support

✓ Weekly/Monthly Check-ins

Determine Engagement Approach

✓ Supports local and remote collaboration for more than 40 concurrent users (CCUs)

Curriculum Integration Strategy

✓ Reconfigurable lesson plans

✓ Most detailed rendering of all anatomic parts

Determine Assessment Methodology

✓ Web-based dashboards for assessments and real-time analytics

Align I.T. Requirements and Protocols

✓ Microsoft Azure and HoloLens for reliable, secure and scalable cloud/ AI services

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Superior Results: The Complete AR Anatomy Lab & Learning Platform

Join Our Rapidly Growing Community of Learning Partners

1,500+
Active Users

13,000+
Assessments

6,000+
Anatomic Parts

NYU Langone Health

VA | U.S. Department of Veterans Affairs

WEST COAST UNIVERSITY · EST 1909 ·

RUSH

CARROLLTON SCHOOL OF THE SACRED HEART

PALM BEACH STATE COLLEGE

NSU NOVA SOUTHEASTERN UNIVERSITY

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References & Further Reading

1. Goldman, Evan. "Building a Low-Cost Gross Anatomy Laboratory: A Big Step for a Small University." Anatomical Sciences Education. 2010.
2. Aidman, B. and Price, P. (2018). Social and emotional learning at the middle level: One school's journey. Middle School Journal.
3. Santos, M., et al. (2016). Augmented reality as multimedia: the case for situated vocabulary learning. Research and Practice in Technology Enhanced Learning.
4. Armstrong, M. (2006) A Handbook of Human Resource Management Practice. 10th Edition, Kogan Page Publishing, London.
5. Dawley, L., & Dede, C. (2013). Situated learning in virtual worlds and immersive simulations. Handbook of research for educational communications and technology.
6. Burns, A. and Richards, J. (2012). The Cambridge guide to pedagogy and practice in second language teaching. Cambridge: Cambridge University Press.
7. Dan, A. and Reiner, M. (2017). Reduced mental load in learning a motor visual task with virtual 3D method. Journal of Computer Assisted Learning,
8. Ertmer, P. and Newby, T. (2013). Behaviorism, Cognitivism, Constructivism: Critical Features From an Instructional Design Perspective. Performance Improvement Quarterly
9. Herrera, F., Bailenson, J., Weisz, E., Ogle, E. and Zaki, J. (2018). Building long-term empathy: Large-scale comparison of traditional and virtual reality perspective-taking. PLOS ONE,
10. Ibanez-Casas, et al. (2013). Deficits in Executive and Memory Processes in Delusional Disorder: A Case-Control Study. PLoS ONE.
11. Lu, S. and Liu, Y. (2014). Integrating augmented reality technology to enhance children's learning in marine education. Environmental Education Research.
12. Fraser, K., Ma, I., Teteris, E., Baxter, H., Wright, B., & McLaughlin, K. (2012). Emotion, cognitive load and learning outcomes during simulation training. Medical Education.
13. Ferrer-Torregrosa, J., et al. (2016). Distance learning ects and flipped classroom in the anatomy learning: augmented reality, video and notes. BMC Medical Education,
14. Gee, J. P. (2003). What video games have to teach us about learning and literacy. New York, NY: Palgrave Macmillan.
15. Hew, K. and Cheung, W. (2010). Use of three-dimensional (3-D) immersive virtual worlds in K-12 and higher education settings. British Journal of Educational Technology,
16. Hoorn, J.F. & Konijn, Elly & Veer, Gerrit. (2003). Virtual reality: Do not augment realism, augment relevance. Upgrade.
17. Jacobson, J. (2013). Digital dome versus desktop display; Learning outcome assessments by domain experts, International Journal of Virtual and Personal Learning Environments,
18. Laurillard, D. (2009). The pedagogical challenges to collaborative technologies. International Journal of Computer-Supported Collaborative Learning,
19. Loup-Escande, et al. (2016). Effects of Stereoscopic Display on Learning and User Experience in an Educational Virtual Environment. International Journal of Human–Computer Interaction.
20. Mayer, B. et al (2011). Improving transfer of learning: Relationship to methods of using business simulation. Simulation & Gaming.
21. Microsoft EDU. (2018). How can technology empower the Class of 2030? |. [online] Available at: https://educationblog.microsoft.com/2018/05/technology-empower-class-of-2030/
22. National Research Council. (2011). Learning science: Computer games, simulations, and education. Washington, DC: Board on Science Education.
23. Nebel S. et al. (2016). From duels to classroom competition: social competition and learning in educational videogames within different group sizes. Comput. Hum. Behav.
24. Norman, G., Dore, K., & Grierson, L. (2012). The minimal relationship between simulation fidelity and transfer of learning. Medical Education.
25. Sommerauer, P. and Müller, O. (2014). Augmented reality in informal learning environments: A field experiment in a mathematics exhibition. Computers & Education,.
26. Wenger, E. (1998). Communities of practice: Learning, meaning, and identity. Cambridge, England: Cambridge University Press.

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