

## Immersive and Engaging Games and Simulations, AR, and VR

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<http://mypage.iu.edu/~cjbonk/>



1

**December 7, 2020**

**What School Could Be**

<https://whatschoolcouldbe.org/>



2

**September 17, 2020**

As more schools offer in-person options, what happens to the students who stay virtual?  
 MJ Slaby, Indianapolis Star, USA Today

<https://www.usatoday.com/story/news/education/2020/09/23/covid-19-how-hybrid-schedules-impact-students-online-learning/5858803002/>

WFOV.COM

As more schools offer in-person options, what happens to the students who stay virtual?

MJ Slaby Indianapolis Star

Continued from B7 Sep 15, 2020 | Updated 12:23 p.m. ET Sep 23, 2020

Facebook Twitter Email



Online learning tips for students at home

As many schools start to offer online learning, here are tips to enhance distance education. Problem Solved, CBS



Parents worry that kids who are learning at home are being disadvantaged or challenged with lack of social interaction. Problem Solved

3

**September 9, 2020**

**Edgewood teachers get creative to keep students engaged**

Emily Hixon, Hoosier Times

[https://www.hoosiertimes.com/herald\\_times\\_online/news/local/edgewood-teachers-get-creative-to-keep-students-engaged/article\\_0b930a64-ec50-11ea-a784-9fa3de654455.html](https://www.hoosiertimes.com/herald_times_online/news/local/edgewood-teachers-get-creative-to-keep-students-engaged/article_0b930a64-ec50-11ea-a784-9fa3de654455.html)

Edgewood teachers get creative to keep students engaged

By Emily Hixon Herald-Tribune Times Staff | 2020 September 9, 2020



4

**November 23, 2020**

**Can AR be the antidote to virtual classroom shortcomings?**

<https://www.eschoolnews.com/2020/11/23/can-ar-be-the-antidote-to-virtual-classroom-shortcomings/2/>

AR brings learning to life and allows students to experience education during distance learning. With AR, students can walk through Stonehenge, tour the Egyptian pyramids, go on a virtual field trip of the Louvre Museum, or explore the cavities of the human heart – all from the comfort of their homes. Students can even take a journey to outer space or visit UNESCO world heritage sites.

The intersection between AR and education is an obvious and endless road of possibilities. Technology is finally reaching a point where it is more accessible than ever before, and every student deserves to benefit from it. Maintaining student engagement during a lengthy Zoom lecture is a lot easier for teachers when students can expect to explore Mount Rushmore or the muscular system in AR at some point. Education is meant to be experienced, and distance learning should not get in the way of that simple truth.



5

**July 7, 2020**

**Elephant in the room: How augmented reality takes online classes to exciting highs,**

Abdul Latheef Naha, The Hindu

<https://www.thehindu.com/news/national/kerala/augmented-reality-takes-online-classes-to-exciting-highs/article32014276.ece>

When the whole world was in a lockdown in April, Mr. Shyam Vengalloor was racking his brains on finding a way to make virtual classrooms more exciting for children. Using green screen, GIF (graphics interchange format) images and several apps, Mr. Shyam succeeded in creating an augmented reality for the virtual class by superimposing graphics, audio and sensory enhancements.

Elephant in the room: How augmented reality takes online classes to exciting highs

Abdul Latheef Naha



A social science teacher of AEM AUP School, Moorkanad, introducing the globe through augmented reality technology during an online class.

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**August 15, 2020**  
**Stephen Heppell**  
**and the Proximity Sensor Headband**



7

**August 15, 2020**  
**And some useful current details here too:**  
**LEARNOMETERS and CoVID-19...**

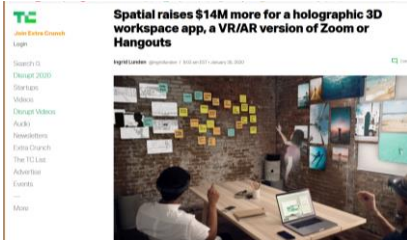
<https://heppell.net/learnometer-19>  
<https://rubble.heppell.net/learnometer/>



8

**September 15, 2020**  
**Spatial raises \$14M more for a holographic 3D workspace app, a VR/AR version of Zoom or Hangouts**  
**Ingrid Lunden, Tech Crunch**

<https://techcrunch.com/2020/01/30/spatial-raises-14m-more-for-a-holographic-3d-workspace-app-a-vr-ar-version-of-zoom-or-hangouts/>



9

**September 15, 2020**  
**We're closer to holographic meetings than you think**  
**Adam Clark Estes, Recode/VOX**

<https://www.ves.com/recode/2020/09/15/21452846/supernatural-reality-lets-us-remote-work-spatial-zoom-calls-feel-like-real-life>  
 Recode meets the founders of Spatial in VR (Sept. 13, 2020: 49 seconds):  
<https://curtbnk.com/recode1.html>  
 Spatial - Collaborate with lifelike avatars in VR/AR/Web (May 12, 2020: 37 seconds):  
<http://curtbnk.com/spatial1.html>  
 Hyper Reality (May 19, 2016: 6:15):  
[https://www.youtube.com/watch?v=YJg02ivYzSs&feature=emb\\_logo](https://www.youtube.com/watch?v=YJg02ivYzSs&feature=emb_logo)



10

**September 15, 2020**  
**Holographic teaching presence:**  
**Participant experiences of interactive synchronous seminars delivered via holographic videoconferencing**  
**Nai Li\* and David Lefevre, Imperial College Business School, Imperial College London**  
**Research in Learning Technology, Vol. 28, 2020**  
<https://journal.alt.ac.uk/index.php/rlt/article/view/2265>



Figure 1. The community of inquiry framework.  
 Garrison, Anderson, and Archer 2000



Figure 3. An example of a display studio.

11

**July 6, 2020**  
**Making Online Learning Active**  
**Steven Mintz, Inside Higher Ed**

<https://www.insidehighered.com/blogs/higher-ed-gamma/making-online-learning-active>



**Making Online Learning Active**

Using digital sources and tools in virtual humanities classrooms.

By Steven Mintz

7 July 6, 2020

We are often so fixated on online learning's shortcomings that we slight its strengths. Students can have anytime, anywhere access to class materials. The can mix sources and data readily available to students: textual, visual, aural, quantitative – and give all students – not simply the most talkative and self-confident – the chance to contribute.

- Student response systems: Polling and quizzing provide a simple way to monitor student understanding in near real time.
- Survey tools: Consider conducting a survey using Google Forms or Survey Monkey – and then you can use anonymous survey data in class to explore attitudes, interests and opinions – or even students' family background and experiences.
- Text mining: A simple tool for mining a text, which can offer insights into word choice, metaphors and imagery. <https://reputix.com/>
- Timelines: Timeline.js and Time Mapper allow students to quickly create a timeline from a spreadsheet.
- Other active learning strategies include:
  - Brainstorming: Asking students to generate ideas collaboratively.
  - Breakout rooms: Dividing students into small discussion groups. Students can have anytime, anywhere access to class materials. The can mix sources and data readily available to students: textual, visual, aural, quantitative – and give all students – not simply the most talkative and self-confident – the chance to contribute.
  - Debates: Assigning formal discussions of a controversy, with students responsible for formulating opposing arguments debates over historical controversies.
  - History behind the headlines: Uncovering the backstory behind a current event.
  - Role playing: Having students assume the role or persons of particular actors or characters.

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**September 3, 2020**  
**Pedagogy and Course Design Need to Change. Here's How.**  
**Steven Mintz, Inside Higher Ed**  
<https://www.insidehighered.com/digital-learning/article/2020/09/03/pedagogy-and-course-design-need-change-here-how>



HIGHER ED GAMMA  
 MOOCs and beyond

**Pedagogy and Course Design Need to Change. Here's How.**

Transforming the way faculty teach, students learn and learning is assessed.

By Steven Mintz  
 17 September 3, 2020



13

**March 29, 2021**  
**Why engage in this?**  
**For what purpose?**  
**Who benefits?**



14

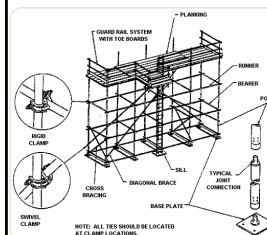
An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.



15

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

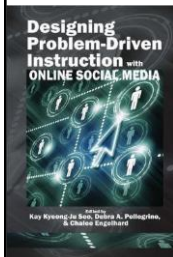
## 1. Scaffolding



16

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 2. Problem-Driven Activities



17

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 3. Exploration



18

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

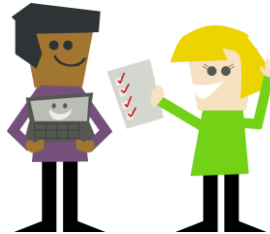
## 4. Context



19

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 5. Interaction



20

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 6. Agency (sense of control)



21

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

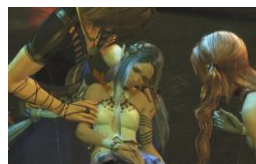
## 7. Learning Through Doing



22

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

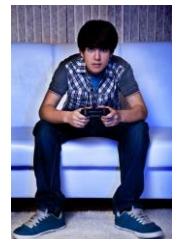
## 8. Pause to Reflect



23

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

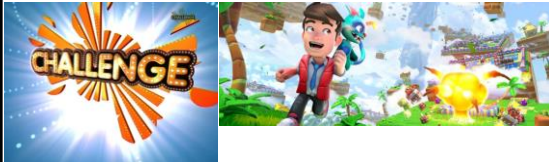
## 9. Learning through Failure



24

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 10. Adaptivity



25

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 11. Character



26

An, Y.-J., & Bonk, C. J. (May/June 2009). Finding that SPECIAL PLACE: Designing digital game-based learning environments. *TechTrends*, 53(3), 43-48.

## 12. Engagement



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## SPECIAL PLACE



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Exploring instructors' perspectives, practices, and perceived support needs and barriers related to the gamification of MOOCs

Yunjo An, Meina Zhu, Curtis J. Bonk & Lin Lin

Journal of Computing in Higher Education  
Research & Integration of Instructional Technology

ISSN 1042-1726

J Comput High Educ  
DOI 10.1007/s12528-020-09256-w



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## Ten gamification mechanics (Chang & Wei, 2016)

- Virtual goods (nonphysical objects purchased for use in online communities or online games).
- Redeemable points (what learners earn and use to redeem virtual items).
- Team leaderboards (leaderboards that list winners' teams and encourage competitions among all learning groups).

Interestingly, the three factors contributing the most to Chang and Wei's factor analysis (i.e., virtual goods, redeemable points, and team leaderboards), are all based on extrinsic motivation.

30

## Ten gamification mechanics (Chang & Wei, 2016)

Chang, J. W., & Wei, H. Y. (2016). Exploring engaging gamification mechanics in massive online open courses. *Educational Technology & Society, 19*(2), 177–203

- Virtual goods
- Redeemable points
- Team leaderboards
- Trophies and badges
- Peer emoticon feedback
- Memory game interactions
- Check points
- Skill points

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## Ten gamification mechanics (Chang & Wei, 2016)

- Trophies and badges ladder.
- Display such trophy and badge info on learner's personal page.
- Allow local and global views to see how rank.
- Give cues when learners are stuck.
- Remind learners how far to proceed b4 next level of rewards.

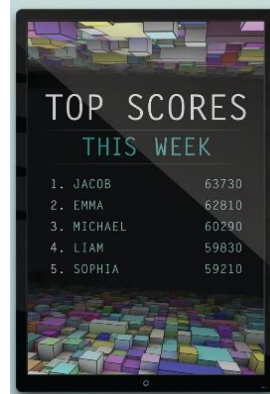
32

## Gamification: Separating Fact From Fiction, Chief Learning Officer, Karl Kapp March 2014

<http://read.clomedia.com/publication/frame.php?i=197905&p=44&pn=&ver=flex>

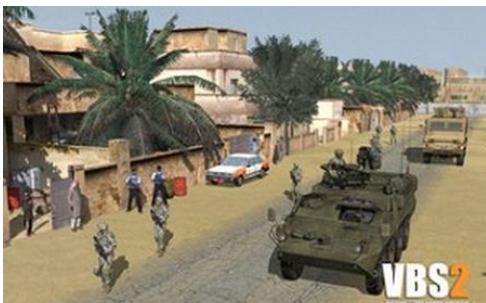


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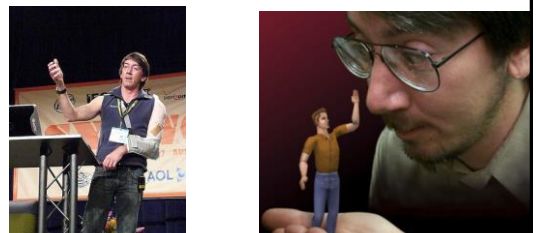
34

## Simulation Games



35

## Alternate Reality Learning (Online Massive Gaming, Simulations, and Virtual Worlds; e.g., Second Life)



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## SimCity



37

## Massive Multiplayer Online Games (MMOGs)



38

Bonnie A. Nardi, Stella Ly, & Justin Harris (2007). Learning conversations in World of Warcraft. forthcoming in Proc. HICSS 2007. Retrieved on June 25, 2010, from <http://darrouzet-nardi.net/bonnie/pdf/Nardi-HICSS.pdf>



Figure One: a night elf priest



Figure Two: Finding a battleground

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Sara de Freitas (2007). Learning in Immersive worlds a review of game-based learning. JISC. Retrieved August 17, 2008, from [http://www.jisc.ac.uk/media/documents/programmes/learninginnovation/gamingreport\\_v3.pdf](http://www.jisc.ac.uk/media/documents/programmes/learninginnovation/gamingreport_v3.pdf)

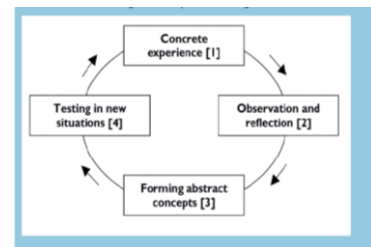


Figure A1: The experiential learning cycle. Source: Kolb, 1984.

40

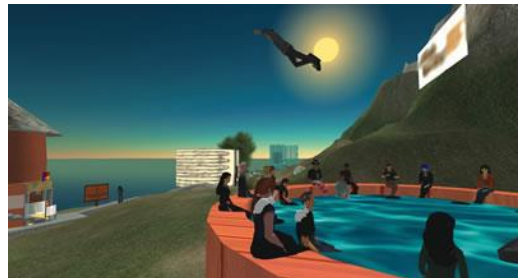
University of Texas: 50 Islands, Nov 2009  
<http://archive.treet.tv/metanomics-campus-life>

Playing Metanomics :: Campus Life



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**Second Life**  
(business, law, education, English, medicine)



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## Second Life (business, law, education, English, medicine)



43

## Second Life (business, law, education, English, medicine)



44

## Second Life (business, law, education, English, medicine)



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## Video Animations and Simulations



46

**December 24, 2010:**  
**Social Networking Gaming**  
*CityVille* 16.8 million daily users, *FarmVille*'s 16.4 million. *CityVille* 61.7 million monthly users, *FarmVille* 56.8 million users. Mashable.

"CityVille" Is Now Bigger than "FarmVille"

December 24, 2010 by Stan Schroeder

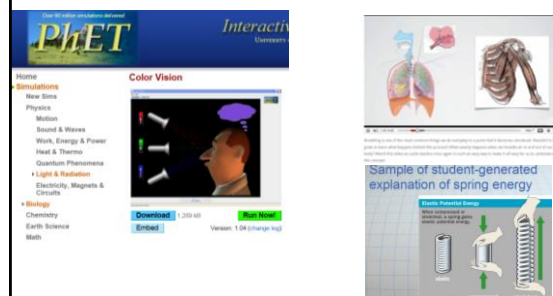


29



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## Interactive Simulations <http://phet.colorado.edu/en/simulation/energy-skate-park>



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[illegible]

**May 18, 2017**


**Learning is More Immersive**

Google Expeditions Adds Augmented Reality for Classrooms, Sri Ravipati, THE Journal  
<https://thejournal.com/articles/2017/05/18/google-expeditions-adds-augmented-reality-for-classrooms.aspx>  
<https://www.youtube.com/watch?v=n-DYdMWTvYg>

27 seconds <http://curtbonk.com/thejournal27.html>  
38 Seconds <http://curtbonk.com/thejournal38.html>  
1:10: <http://curtbonk.com/thejournal.html>

Google Expeditions Adds Augmented Reality for Classrooms

Augmented Reality for Classrooms



The image shows two tablets displaying Google Expeditions AR content. Each tablet screen shows a 3D scene of people in a historical setting. Overlaid on each screen is a circular AR marker with a red square in the center and the text 'EXPEDITIONS' and 'AR MARKER' around it. The tablets are connected by a thin line, suggesting a shared or synchronized experience.

# July 17, 2017

## Learning Chemistry in Virtual Reality, Sarah Hardman, New Learning Times

<https://newlearningtimes.com/cms/articles/6519/learning-chemistry-in-virtual-reality>  
1:38 video: <https://vialogues.com/vialogues/play/38377>  
All: <http://courbonk.com/chemistry-vr.html>  
6:1-41: <http://courbonk.com/chemistry-vr-2.html>  
41:1-1:16: <http://courbonk.com/chemistry-vr-3.html>  
1:16-1:36: <http://courbonk.com/chemistry-vr-3.html>


**May 1, 2018**


**Learning is More Hands-on**

**3 ways districts can use AR and AI**

**Justin Anglio, eSchool News**

<https://www.eschoolnews.com/2018/05/01/using-ways-you-districts-to-learn-ai-and-ar/>

A person wearing a VR headset is shown from the back, interacting with a virtual environment. The environment features a large, glowing yellow sphere with green lines, and several floating, colorful geometric shapes (a yellow cube, a green sphere, and a blue cube) on a blue and white tiled floor.

A person is shown from the back, interacting with a large screen displaying a game interface. The screen shows a colorful, abstract scene with a yellow sphere and green lines, similar to the one in the left image. The person's hand is raised, touching the screen.

**EarthShake, the first educational game for the NoRILLA system, teaches early physics principles through hands-on learning.**


**May 1, 2018**

**Learning is More Immersive**

**3 ways districts can use AR and AI**

**Justin Anglio, eSchool News**

<https://www.eschoolnews.com/2018/05/01/3-ways-districts-can-use-ar-and-ai/>



When a teacher glances around her classroom, Lumio allows her to see real-time analytics (in the form of icons) floating directly above each student's head. The teacher can glance directly at a student or "click" on a student's icon to see more detailed information about where and how that student might be struggling.

**December 5, 2018**  
**Learning is More Immersive**  
**Empathy Earster, Penny Pan**

Here is more info (in Chinese)  
 project video: [https://www.youtube.com/watch?v=7rzd5v0u6f0\\_20](https://www.youtube.com/watch?v=7rzd5v0u6f0_20)  
 project website: <https://www.atsday.net/projects>  
 KAAA fan page: <https://www.facebook.com/527008346722426/>



## April 8, 2018 Pros and Cons of Virtual Reality in the Classroom

Adam Evans, The Chronicle of Higher Education  
<https://www.chronicle.com/article/ProsCons-of-Virtual-283018?cid=ip-197>

Pros and Cons of Virtual Reality in the Classroom



### Pro:

An art professor might virtually guide students in his rural-Kentucky classroom through an exhibit happening in Paris, allowing them not only to explore works of art but also to virtually hold and examine them up close. A biology class might virtually travel down DNA strands previously visible only through a microscope.

### Con:

We need to be having conversations about the ethics of using virtual reality in the classroom. Just because we have the ability to virtually transport a student to a war-torn country or a historical moment in time does not mean we should do so without thinking of possible consequences. What ethical obligations might faculty members owe our students during these experiences?

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## July 22, 2016 (Engagement) Learning is More Game-like

When Pokémon Goes to Campus:  
The Good, the Bad, and the Ugly  
Gabriel Sandoval, Chronicle of Higher Education  
<https://www.chronicle.com/article/When-Pokemon-Goes-to-Campus-243000?cid=ip-197>



Pokémon Go players converged last week on the U. of Nebraska at Lincoln's Memorial Stadium, which officials had opened to the animated-monster hunters. The hit augmented-reality game has prompted many colleges to jump on the bandwagon.

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## September 5, 2017 Learning is More Immersive Get ready for thousands of augmented reality Apple apps

Jefferson Graham, The USA Today  
At Pets (.34): <http://curtbnk.com/arkit.html>  
Meal (30 seconds): <http://curtbnk.com/arkit2.html>



The Food Network's app will be updated for AR in the new version of iOS11. (Photo: Food Network)

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## January 6, 2017 Virtual Reality and Its Implications for Workplace Learning, Elliott Masie, Masie Center (publish a 2017 open source, vendor-neutral analysis) <http://masie.com/VRLearn2017/VRLearnReport-2017.html>



Multiple Pathways Create Multiple Approaches to Learning

The learner is able to:

- Take the test/course multiple times and explore multiple solutions
- Explore different options/solutions with the freedom to fail without risk
- Explore new ways to be successful without the worry of using resources

Empathy and Risk Drive Engagement

The learner is able to:

- Feel like they are taking an actual risk and make decisions accordingly
- Experience a situation from the perspective of another person (e.g. someone with a disability, or someone with a different nationality). This is called the "In Your Shoes" effect

WHAT ARE THE EXPERIENCES OF VRLearn?

360° Immersive Views of the Workplace or the Learning Environment Provide Opportunities for Contextual Learning

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## January 6, 2017 Virtual Reality and Its Implications for Workplace Learning, Elliott Masie, Masie Center (publish a 2017 open source, vendor-neutral analysis) <http://masie.com/VRLearn2017/VRLearnReport-2017.html>

The learner is able to:

- Move around and explore the immersive experience
- Try things out in a safe, simulated environment without risk
- Manipulate, shrink, and enlarge objects in all directions
- Move freely in the experience and look through panels and walls
- Create an object and have it run based on the actual laws of physics

Learn Directly to Create a Personalized Learning Experience

The learner is able to:

- Control, direct and customize the course
- Change the perspective at any time
- Start over and retry an experience
- Change the speed of the course
- Remove or add elements to the experience

- Understand workplace or location-specific cultural etiquette
- Behave differently than they normally would and experience the effects of those behaviors on themselves and others without consequences

Physical and Emotional Engagement

The learner is able to:

- Experience full physical motion in the real world to navigate a scenario in a VR world
- Bring up body temperature and feel tense, raising muscles to tighten up and flex
- Feel emotions like fear, excitement and curiosity



MASIE Report 2017 | [www.masie.com](http://www.masie.com) | [info@masie.com](mailto:info@masie.com)

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## January 6, 2017 Virtual Reality and Its Implications for Workplace Learning, Elliott Masie, Masie Center (publish a 2017 open source, vendor-neutral analysis) <http://masie.com/VRLearn2017/VRLearnReport-2017.html>

Storyboarding on Headsets

The learner is able to:

- Experience scenarios, new techniques and procedures, or prepare for difficult tasks without having to worry about failure
- Experience a story in a much more dynamic way with 360° comments
- React unconsciously to explore more options and alternate solutions
- React to many elements of a story and, in return, learn more about it
- Experience the same or altered VR scenario over and over

Radiance and Full Forward Effect

The learner is able to:

- Interact with multiple times
- Feel virtual risk, which encourages them to explore new solutions and be creative in their solution
- Observe a problem, form a hypothesis, test that hypothesis, and correct it by trying again and again until success is achieved
- Practice and be rewarded for finding their own creative solution to their problem solving. This encourages the learner to keep trying
- Get an alternative approach, one that might provide the learner or more productive than a previously learned approach

Data Risk Environment

The learner is able to:

- Compare various and follow view from different perspectives
- Determine which routes they took were more or less productive
- See a comparison of how they physically reacted in real time or again
- Contribute data to be used for future training with teams, individuals, or on a company-wide level

By combining all of the above, the learner can achieve an "A/B/C" effect

The learner is able to:

- Be fully engaged. All of their senses are being provided to make things and reactions feel real
- Be able to learn and retain more information



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**January 6, 2017**  
**Virtual Reality and Its Implications for Workplace Learning, Elliott Masie, Masie Center**  
 (publish a 2017 open source, vendor-neutral analysis )  
<http://masie.com/VRLearn2017/VRLearnReport-2017.html>



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**January 6, 2017**  
**Virtual Reality and Its Implications for Workplace Learning, Elliott Masie, Masie Center**  
 (publish a 2017 open source, vendor-neutral analysis )  
<http://masie.com/VRLearn2017/VRLearnReport-2017.html>



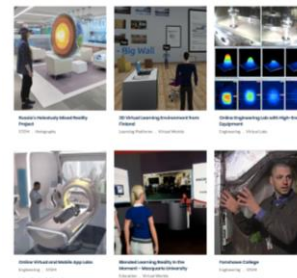
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**August 8, 2017**  
**Learning is More Game-like ShortSims**  
<http://www.shortsims.com/>  
 Clark Aldrich [clarkaldrichdesigns.com](http://clarkaldrichdesigns.com)



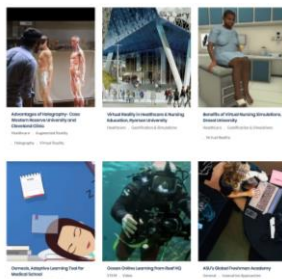
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**October 21, 2018**  
**Virtually Inspired**  
<https://virtuallyinspired.org/>



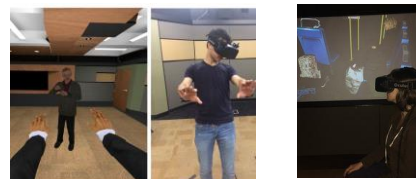
64

**October 21, 2018**  
**Virtually Inspired**  
<https://virtuallyinspired.org/>



65

**April 10, 2016**  
**Virtual reality tested by NFL as tool to confront racism, sexism**  
 Marco della Cava, USA Today  
<http://www.usatoday.com/story/tvtech/news/2016/04/08/virtual-reality-tested-tool-confront-racism-sexism/8267406/>



One VR diversity demo places the user in the body of an African-American woman as a white male avatar gets aggressive mere feet away. (In one Stanford VR demo, subjects are made to feel what it is like to be homeless, as in this scene where the user is transported into the body of a woman riding the bus with a few possessions.)

66

**June 3, 2016**  
**Explosion of Virtual Reality**  
**VR Lets Med Students Experience What**  
**It's Like To Be 74**

Elyse Wanshel, Huffington Post  
<http://ht.ly/hSpe300XEPJ>

Virtual Reality Lets Med Students Experience What It's Like To Be 74

This could be exactly it for the average non-medical into VR



67

**July 19, 2017**  
**Learning is More Immersive**  
**HoloLens Assists in Live Surgery**

Tommy Palladino, Next Reality  
<https://hololens.nextreality.com/news/hololens-assists-live-surgery-0178887/>  
 Video #1: 1:09: <http://curtbonk.com/hololens.html>  
 Video #2: 1:37: <http://curtbonk.com/hololens2.html>

07/19/2017

HoloLens Assists in Live Surgery  
 Numerous examples exist of doctors and surgeons using HoloLens to plan surgeries. The device has even been used to view reference images during a procedure and stream it to a remote audience. Until recently, it has not been used to augment the surgeon's view of the patient during a live surgery.

Original Video: <https://hololens.nextreality.com/news/hololens-assists-live-surgery-0178887/>



68

**July 19, 2017**  
**Modern medicine breathes new life into virtual training**  
<https://www.arkhiv.com/arkhiv/tech/2017/07/19/modern-medicine-breathes-new-life-into-virtual-training-04072868c>

2:34 (entire video): <http://curtbonk.com/vr-medicine4b.html>  
 .01-.21: <http://curtbonk.com/vr-medicine.html>  
 .37-.56: <http://curtbonk.com/vr-medicine2.html>  
 .57-1.29: <http://curtbonk.com/vr-medicine3.html>  
 1:30-2:27: <http://curtbonk.com/vr-medicine4.html>



69

**May 28, 2019**  
**Virtual Reality Comes to the Classroom**  
**Beth McMurtrie, The Chronicle of Higher Education**  
<https://www.chronicle.com/interactives/20190528-ImmersiveTech>



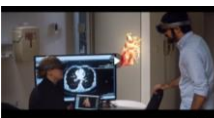
Using a special recording system, Hamilton College created a virtual-reality experience for students in a conducting class. Heather Buchman, a music professor, first recorded a performance using 3-D audio and video. (Andrew Groll)

Students later practiced conducting the virtual orchestra by wearing a special headset through which the sound of the orchestra changes as they turn their head. (Ben Salzman)

70

**May 28, 2019**  
**Virtual Reality Comes to the Classroom**  
**Beth McMurtrie, The Chronicle of Higher Education**

<https://www.chronicle.com/interactives/20190528-ImmersiveTech>  
 A virtual-reality experience for students in a conducting class: <http://curtbonk.com/virtual-o.html>  
 A group of students could gather around a virtual heart: <http://curtbonk.com/wheret.html>

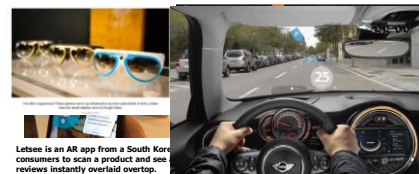


Unlike VR headsets, augmented-reality glasses allow users to see the world around them, opening up possibilities for shared learning experiences. A group of students could gather around a virtual heart as their professor takes it apart to show them the components. (Microsoft)

71

**June 10, 2015**  
**Augmented reality promises 'superpowers', and people are listening**  
**The USA Today, Marco della Cava**

<http://www.usatoday.com/story/tech/2015/06/10/microsoft-hololens/2811773>  
<https://www.youtube.com/watch?v=a7TCo9TgUk4>



Letsee is an AR app from a South Korean consumer to scan a product and see reviews instantly overlaid on top.

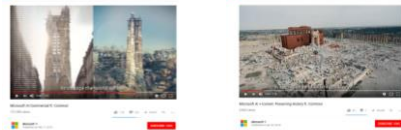
72

**April 22, 2018**

### Learning is More Visual

#### Microsoft AI Commercial ft. Common

Video 1:00: Microsoft AI Commercial ft. Common <https://www.youtube.com/watch?v=8haC72h0w8I> (Feb 11, 2018)  
Video 1:48: Microsoft AI: Amplifying Human Ingenuity <https://www.youtube.com/watch?v=V0m9Y25N9Yg>  
Video 1:00: Microsoft AI: Empowering Teachers ft. Common <https://www.youtube.com/watch?v=2X29h3d7t7E> (April 23, 2018)  
Video 1:00: Microsoft AI + Common: Preserving History ft. Common <https://www.youtube.com/watch?v=Z0ZJafteMSM> (April 22, 2018)  
Video 0:44: Microsoft AI + The Yield: Taking the guesswork out of farming ft. Common <https://www.youtube.com/watch?v=72uaf80H6s> (April 22, 2018)



73

**April 2, 2015**

### Learning is More Immersive

*The Quest to Put More Reality in Virtual Reality,*  
Review: Samsung rises to challenge with Galaxy S6 and S6 Edge,  
Edward Baig, USA Today

<http://www.usatoday.com/story/tech/columnists/baig/2015/03/31/samsung-rises-to-challenge-with-galaxy-s6-s6edge/79727752/>



Review: Samsung rises to challenge with Galaxy S6 and S6 Edge



NextVR crewmembers set up their virtual reality cameras at an NBA game, allowing viewers of the live event to see the game from a variety of positions in the arena.

74

**June 1, 2017**

### Learning is More Immersive

Major League Baseball to live-stream games in virtual reality  
Edward C. Baig, USA Today

<https://www.usatoday.com/story/tech/columnists/baig/2017/06/01/mlb-vr-live-stream-games/1031786200/>  
High school sports video: <https://www.youtube.com/watch?v=7d7d7d7d7d7>  
Super High School Sports video: <https://www.youtube.com/watch?v=7d7d7d7d7d7>



75

**May 30, 2017**

### Learning is More Immersive

Fly above the water with Oracle Team USA in 360

<https://www.usatoday.com/story/tech/columnists/baig/2017/05/30/oracle-team-usa-360/1031786200/>

The Quest 1.7 review: <https://www.youtube.com/watch?v=7d7d7d7d7d7>  
1:01 to 1:54: <https://www.youtube.com/watch?v=7d7d7d7d7d7>  
Whole video: <https://www.youtube.com/watch?v=7d7d7d7d7d7>



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### Any Questions?



Slides at: **TrainingShare.com**  
Papers: **PublicationShare.com**  
Book: <http://worldisopen.com/>  
Email: [curt@worldisopen.com](mailto:curt@worldisopen.com)



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