xR in EDU

xR in EDU Survey: Benchmarking Adoption Trends in K12 and Higher Education

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Presented by:

edtechtimes SRI Education Labster Lifeliqe

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The 2018 xR in EDU Survey is a collaborative research effort between EdTech Times and SRI International. Labster and Lifeliqe were key partners in this work.

About EdTech Times
EdTech Times is a digital media & consulting company facilitating communication and partnerships at the intersection of education, technology, innovation, & work. With media, events, consulting, & research, we're supporting people improving the world through education.

edtechtimes

About SRI International
SRI is an independent, nonprofit research center that works with clients to take the most advanced R&D from the laboratory to the marketplace. Serving government and industry, they collaborate across technical and scientific disciplines. For more than 70 years, they've led the discovery and design of ground-breaking products, technologies, and industries.

SRI International

About Labster
Labster is an award-winning company that focuses on empowering the next generation of scientists with engaging lab simulations. Their platform offers a Virtual Laboratory where students can work with real-life challenges in an online environment that simulates reality.

Labster

About Lifeliqe
Lifeliqe is a platform that makes it exciting to learn and teach science with interactive 3D models, as well as AR, VR, & MR. Offering the first K-12 science curricula for schools enhanced with interactive 3D models, Lifeliqe has over 1,300 models and over 700 lesson plans for STEM.

Lifeliqe

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about the authors

Hester Tinti-Kane
Hester has partnered with major research organizations on qualitative and quantitative projects focused on the adoption of technology. She is the co-author of *Social Media for Teaching and Learning*, a 4-year research series published alongside Babson Survey Research Group. As CEO of EdTech Times, she has published and hosted podcast series on a number of topics in education and technology. Under her leadership, EdTech Times continues to build a network of thought leaders and organizations in the education, technology, and workforce industries. Hester has spoken at a number of national education and technology conferences, including CES, ASU GSV, and EdTech Times' work+EDU and xR in EDU. This is her first project with SRI International.

Phil Vahey
Phil's research examines the design and use of technology-based systems that enhance the learning of conceptually difficult STEM concepts from preschool to middle school. He also investigates how to scale up the use of these systems, and work with commercial clients to leverage the findings from research in large-scale implementations. This is Phil's first project with EdTech Times.

acknowledgements

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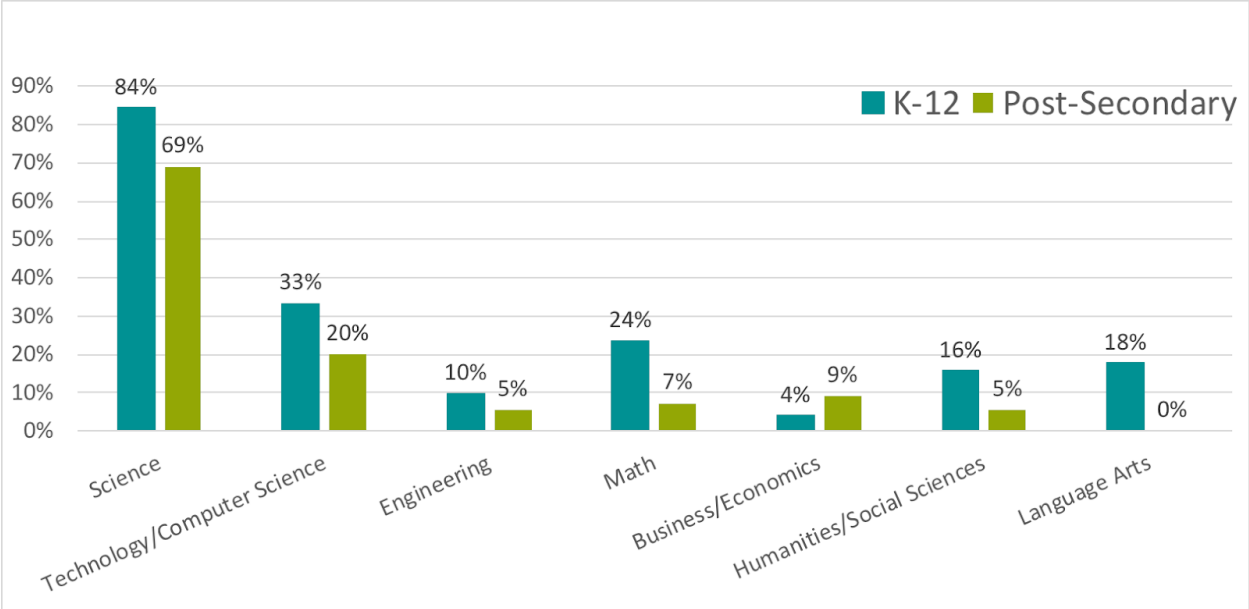
Thank you all so much!

Hester Tinti-Kane
CEO
EdTech Times

executive summary

Survey Methodology and Sample
This project began in the fall of 2017 with one primary research question—what does adoption of augmented (AR), virtual (VR), and mixed reality (MR) in education look like? (Please note that collectively, the abbreviation for all of these technologies will be referred to as “xR” throughout this report). Additionally, we were looking to understand what experiences with these technologies could uniquely provide to learners. With those initial questions in mind, we elicited expert feedback from a number of thought leaders in virtual reality and education research. When our core team set to work, a survey instrument was designed. In order to discover as much as possible about implementation of these technologies, we knew we needed a sample that had a good percentage of “initiated” members who were practitioners at some level. Labster and Lifeliqe agreed to allow us access to their user communities and through email, we shared the link to the survey. The link to the survey was also shared in a limited way to EdTech Times and SRI communities. This executive summary explains what we learned in this first attempt at what we plan to be a global, longitudinal study on the adoption of augmented, virtual and mixed reality in education and training.

Our xR in EDU survey was completed by 115 individuals. The majority (70%) of these educators came from the Labster user community, the second largest representation (26%) was from the Lifeliqe user community and remainder (4%) was from EdTech Times and SRI subscriber communities. 42% of the sample was from the United States. The remaining sample was widespread globally across 37 countries, with the most non-US educators coming from Canada, Australia and India in that order. In terms of years teaching, which we felt was important to learn, the majority of the sample (92%) had more than 3 years of experience. 23% of the respondents had over 20 years of experience. When asked what grade range they taught, 44% of the sample reported that they taught higher education, 36% reported that they taught K12, and the remainder fell into other categories. Science, followed by Technology/Computer Science were the subjects most commonly taught by our sample.



N=115

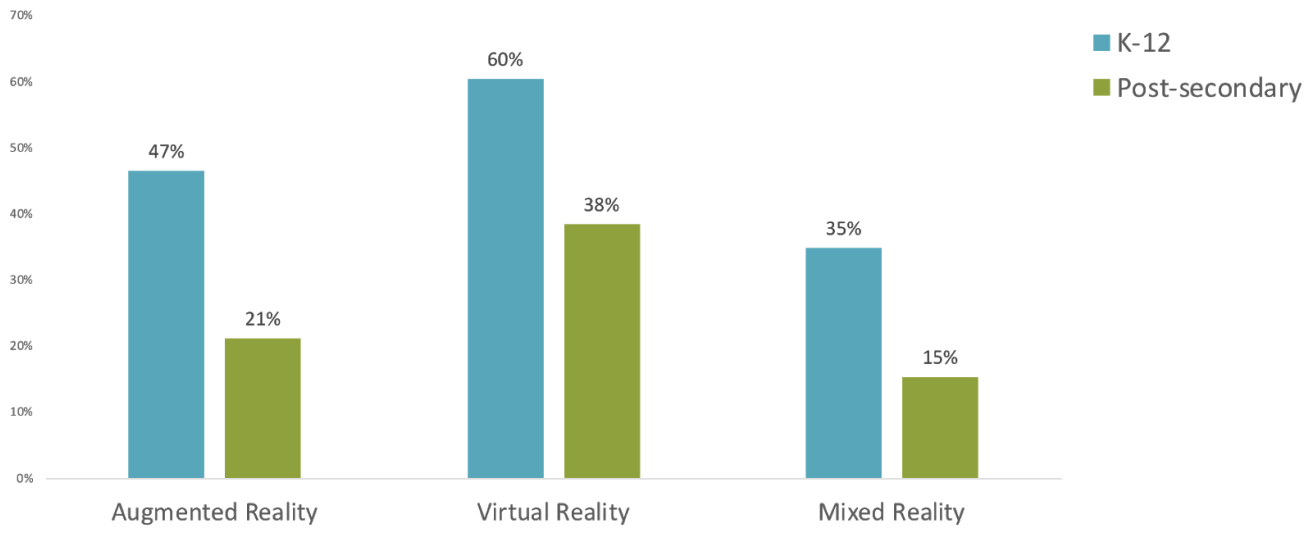
Existing Research

According to Veronica S. Pantelidis, co-founder and co-director of the Virtual Reality and Education Laboratory at Eastern Carolina State University[1], virtual reality's impact on education and training has been explored since the 1980s.[2] One significantly large project, by Samsung Electronics America, Inc. and GfK, was published in 2016 and established K12 teacher interest in using virtual reality in teaching. In their project, they surveyed over 1,000 K12 teachers across the United States about whether they would consider using virtual reality in their classrooms. Results showed that the majority of teachers (85%) felt that virtual reality would have a positive impact on their students and 2% were already using this technology in their classrooms. The respondents shared a number of opportunities that they felt the technology could provide including curriculum specific simulation experiences, exploration of inaccessible locations, world travel and supplementing curriculum to provide students with a deeper understanding of course content.[3] In our survey we focused on "initiated" educators who had experience with xR to better understand how they use and think about these technologies.

Familiarity, Awareness of Educational Uses, Adoption in classes

At the beginning of our survey, definitions for augmented reality (AR), virtual reality (VR) and mixed reality (MR) were provided to the survey respondents. xR was described as the summative term for all technologies. When asked, 73% of respondents said they would be interested in using xR with their students. VR was the medium that our sample was most familiar with, had seen or experienced. They were also most aware of educational uses for VR, and had used VR most in classes. MR was the least familiar to

them, the one they were least likely to have experienced or were aware of educational uses for and the least likely to have used in classes. Below is a chart showing responses to the question of which technologies had been used in classrooms.



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Impact on Students, Best Uses in Education, Reasons to Use xR

When asked how they felt xR impacted their students, the majority of respondents who had used these technologies in their classrooms (91%) said that xR had a medium to large positive impact. The richest open ended responses, and some of the most valuable feedback from our sample, came from our questions regarding the best use for xR in education and their reasons behind using this technology with students. The following themes were all used a number of times throughout open ended responses:

"Visualization" xR supports visual learning in general, provides three dimensional visualizations, helps students visualize microscopic objects as well as abstract or complex concepts, ecosystems and reactions.

"Control", "Personal" and **"Independent"** xR provides interactive experiences that students can control and facilitates students taking control of their learning. It enables personal experiences motivating students to learn independently.

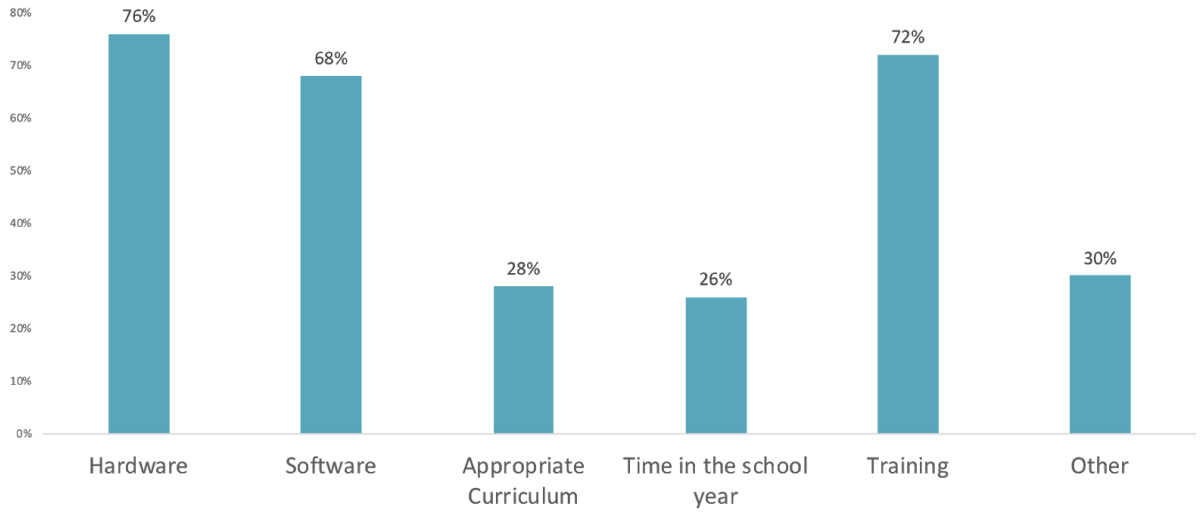
"Real life" xR creates practice space for scenarios, reactions and changing situations they would experience in real life. It supports practical training to be used in real life,

actual lab work as one example, and the teaching of this technology is valuable to prepare students for real life and careers.

“Beyond the classroom” xR provides equity and access for all students to virtually experience places and phenomena beyond the physical classroom.

Barriers to Adoption

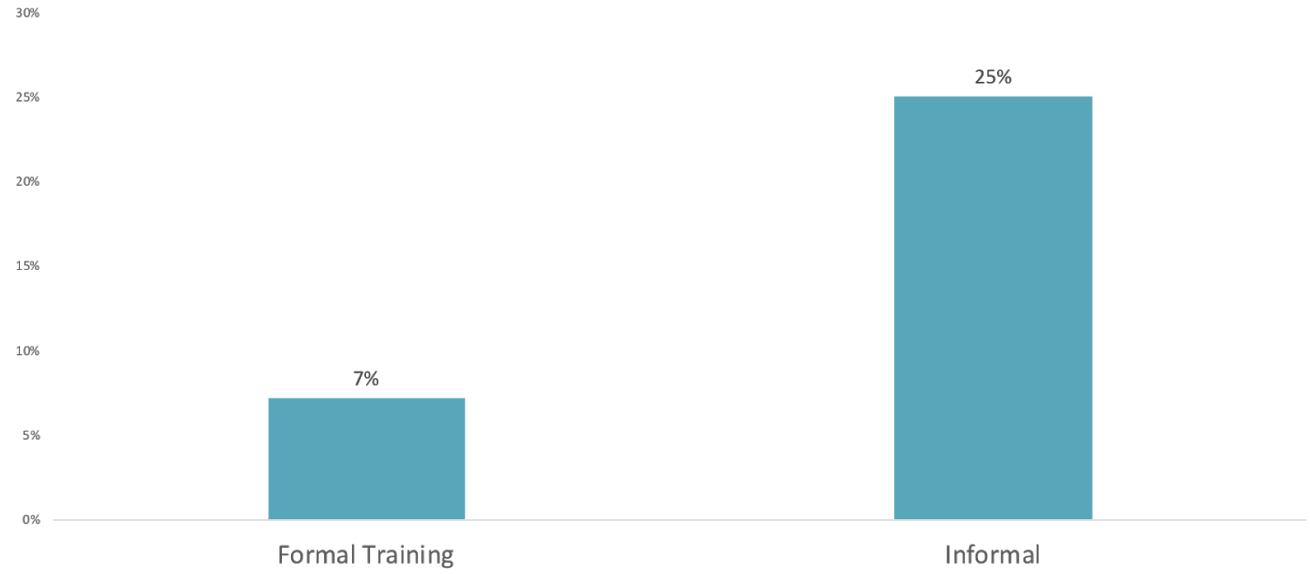
After hearing from our sample how xR could best be used in education, we then moved on to examine the responses to our questions about what was holding potential and actual adopters back from using this technology with students. The number one response (from 76% of respondents) was the lack of needed hardware. This was shown in more detail in the open ended responses about concerns of the costs of this technology and the independent nature of funding at the educator level. Mentions of lack of institutional support emphasized the need for more education about this technology.



N=50

Lack of training was the next biggest thing preventing educators from using this technology with students. When asked if they received any professional development for using the technologies, 75% of the sample replied “no”. The remaining 25% are represented in the graph below. The majority of those who did receive professional development replied that it was informal training and some noted that they had received both informal and formal training (7%). Surprisingly, 41% of respondents said they felt “very confident” using these technologies with their students. When asked to describe challenges the sample encountered using xR with their students, the open ended

responses were once again rich in detail and included unreliable internet connectivity and lack of education content, especially content relevant to their curriculum.



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Conclusions

Overall, this initial look into the awareness of, value seen in and barriers to using xR is a starting place. We've heard some of the voices of higher education faculty and K12 teachers. We've learned that our results align with some of the earlier broad surveys done about adoption attitudes about this technology. Some of the other 2016 Samsung survey findings aligned with ours as well—particularly the xR uses recommended by teachers. The potential for xR to provide students with experiences outside of the physical classroom and its facilitating deep learning experiences came up in both studies. The challenges of lack of hardware and financing the adoption of this technology will be areas to watch as the xR industry brings less expensive models to market. The professional development challenge will be another to keep our eyes on as industry providers invest more heavily in the education market and build out more formal programs. If adoption of xR technology accelerates the way we expect it to, perhaps training will become less of a challenge as using it becomes part of people's daily lives.

In the months and years to come, we plan to expand this research with both qualitative and quantitative exploration. For our 2019 survey, we will work towards a larger, more representative global sample. Professional training is a growing space in xR and we will begin exploring adoption in that space, either as part of this annual survey or in an independent project. We strongly believe that xR is a transformative technology that will change the way students of all ages experience learning. Future research may also include the use of xR in special education and in informal learning environments like libraries and museums. We welcome you to join us on this journey!

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