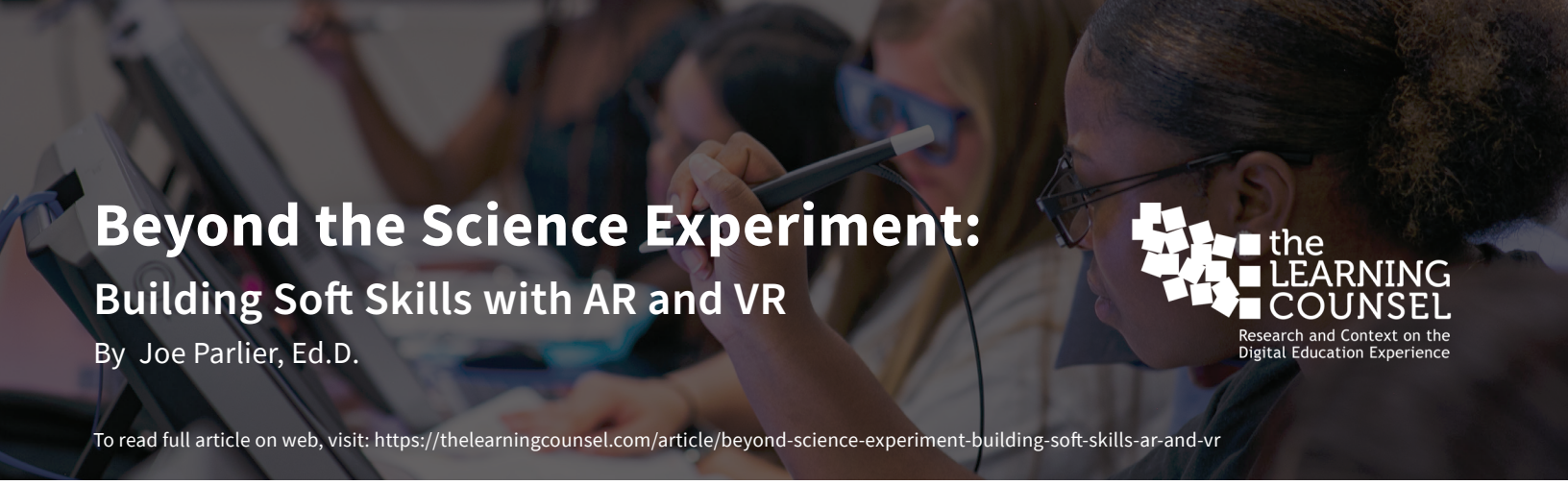

Beyond the Science Experiment:

Building Soft Skills with AR and VR

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the LEARNING COUNSEL
Research and Context on the Digital Education Experience

To read full article on web, visit: https://thelearningcounsel.com/article/beyond-science-experiment-building-soft-skills-ar-and-vr

> *...Students are able to develop soft skills that are critical to success in both higher education and the workforce.*

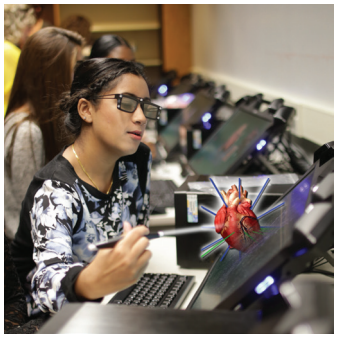
As augmented reality (AR) and virtual reality (VR) learning experiences become increasingly common in K-12 classrooms, the value this technology brings to STEM and Career and Technical Education programs is becoming increasingly evident. Educators are using immersive technology to expose students to worlds and situations that would be challenging or impossible in a classroom setting: exploring human and animal anatomy; building and observing the flow of air through car engines; learning trades such as welding; and travelling to communities and countries to experience different cultures.

These interactive experiences empowered by AR and VR often deliver social and emotional learning opportunities in addition to the scientific lessons. Both in STEM programming and in non-scientific AR and VR applications, students are able to develop soft skills that are critical to success in both higher education and the workforce.

When it comes to developing empathy, persevering when confronted with challenging content or failure, managing anxiety, and developing critical thinking skills, AR and VR applications help educators support students to overcome some of the common barriers to learning and deliver skill-building programming.

Persevering Through Failure

Although failure is a natural and important part of learning, students are often discouraged to make mistakes. Fortunately, educators are shifting to problem/solution and experiential learning approaches that value a learning process that includes failure to directly help children understand how to deal with adversity.



Rather than shielding students from making incorrect choices, AR and VR applications incorporate failure as an effective strategy for learning — students will make mistakes and must develop the grit and perseverance to try again. In virtual worlds, failing is not catastrophic — even if a mistake results in destroying an engine by applying too much energy, breaking an expensive part as a result of using an inappropriate tool, or realizing the negative impact of a surgical process.

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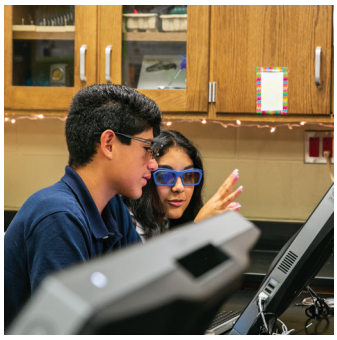
When students work or learn in a virtual space, they are able to fail safely and receive immediate feedback to improve the accuracy of their thinking, thus learning from their mistake. Then, they can replicate processes and adjust variables to address their errors while learning from the process, as opposed to simply focusing on an outcome. Additionally, through the process of making mistakes, students are able to receive valuable feedback from their peers and teachers to impact their learning of critical concepts.



When challenges and failures are embraced as learning opportunities, students are equipped to deal with setbacks and learn how to focus and work to overcome challenges in their future learning or careers.

Overcoming Anxiety and Developing Confidence

Managing social interactions and stress-inducing encounters aren't skills that come naturally to children dealing with anxiety or who may be on the autism spectrum, and such experiences can be debilitating. Exploring situations within a virtual world can provide the tools to help students manage challenges not only in academics, but also social settings.

For students who have difficulties reading and reacting to social cues or managing emotions, applications exist that provide virtual experiences to help them identify triggers and learn how to successfully manage anxieties that can be crippling. Learners can also practice social interactions in a virtual environment by working through simulations that help them become more comfortable with eye contact and other body and social cues.

As students prepare for life after high school, the opportunities to work through situations such as job interviews, presentations or public speaking can help set them up for career success and improve how they personally engage with others, both in group settings and one-on-one. When interactions have been explored multiple times virtually, it makes the real-world experiences manageable and even empowering.

> *"When interactions have been explored multiple times virtually, it makes the real-world experiences manageable and even empowering."*

Empathy and Compassion Through Cultural Exposure

To help people understand empathy and compassion, we teach the idiom, "Before you judge a man, walk a mile in his shoes." AR and VR make this journey possible.

Students can use AR and VR applications to travel to other countries to experience different cultures and other eras to explore different times in history. Students can take on virtual personas to understand the challenges experienced by other cultures and feel the effects of societal change. This immersive learning brings a unique perspective as students can comprehend not just the what, but the why of human history.

These learning experiences also fuel critical thinking skills — for example, students can see what and how human actions contribute to climate change by virtually engaging with the planet. AR and VR can be used to demonstrate the impact of various human activities on the earth's ecosystem, with students manipulating cause and effect and

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seeing the results (positive and negative) firsthand. Watching the virtual destruction of coral reefs, glaciers or coastal landscapes — then having the ability to counter the impact based on different factors — provides opportunities for observation and analysis that textbooks or videos simply cannot communicate as effectively.

Soft skills like critical thinking, teamwork, communications and dealing with adversity are frequently cited as missing from young adults entering higher education and the workforce. It is important that educators explore each teaching and learning method as an opportunity for students to grow socially and emotionally, in addition to academically. Even when sharply focused on scientific applications, the impact of AR and VR experiences extends far beyond the lesson. Virtual and immersive learning experiences are creating confident, shrewd and creative thinkers -- attributes that will create successful professionals in the future.

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