S

cience is just cool. Plain and simple. You can find science at play in all our surroundings. Whether one recognizes it or not, science can explain everyday encounters like music being heard from an instrument to more obvious interactions like combustion of materials. Because of these natural occurrences, classroom teachers have the opportunity to demonstrate science in action through everyday examples. Historically, science was taught in isolation using traditional pedagogical practices. Over the last 25 years, teachers of science have embraced hands-on types of sciences activities, and integrated forms of technology (e.g., graphing calculator, probes, and the like) to increase engagement and bring relevant experiences to the science classroom. More recently, the Next Generation Science Standards have influenced how we approach the teaching of science; however, students have redefined the definition of engagement.

Today’s generation of students are living in a world of immersive technology. They prefer to receive news and information through Facebook or Instagram, and are highly engaged in self-directed learning using YouTube. Their utilization of these platforms requires teachers to reexamine their own interpretation of student engagement and hands-on learning. These types of self-directed, interest-based student activities are surely a call-to-action for all educators to seek out new ways to reach and teach students…and is most definitely a clarion call for teachers of gifted students.

A recent article published by Family Zone (2017) reported that kids under 8 years old spend 65% of their online time on YouTube. Although social media platforms such as Twitter, Instagram, and Snapchat come into play as they get older and their use of YouTube diminishes, YouTube retains the top spot through adolescence. Although many teachers use YouTube as an instructional video platform in the classroom, the use of YouTube as a hands-on engagement tool or as a component of immersive technology is not fully realized. There are a number of ways to use YouTube to direct hands-on immersive science activities. Let us look at one way that will greatly increase student engagement in science while fully embracing emerging trends in technology and student interest.

Utilizing / Creating 360 Virtual Reality YouTube Videos for Instruction and Learning

The year 2018 will be huge for Virtual Reality (VR) technology. The use of VR is expected to nearly double in monthly users annually bringing estimates to 17 million monthly U.S. users by 2019 (Roettgers, 2017) due to innovations in industries such as gaming (e.g., Oculus, PlayStation), social media, and in music and entertainment. Not surprisingly, Facebook is the largest single investor in VR (and Augmented Reality aka AR) (Merel, 2017). Facebook’s highly-anticipated live VR platform “Facebook Spaces,” is expected to roll out in 2018, and the 2018 FiFA World Cup will be broadcast (by NBC) in VR. If they have not already, there is no doubt that children will engage in VR soon. The rise of both VR and AR serves as a predictor for the future trajectory of teaching and learning.

Although it is a newer technology, there are many 360 VR science videos on YouTube. Google Cardboard Glasses are available from Amazon for less than $7 USD. Coupled with a smart phone, iPod Touch or other hand-held tablet device, students can experience science in a virtual space. The glasses/headset is not required to view typical VR videos (if you only want students to experience a 360-degree view of a video); however, they are required for an immersive experience.

To differentiate instruction for advanced learners, have students create their own VR science experience using the Google Cardboard Camera app available on both iOS and Android app stores. If you want to explore other options, consider using the Full Dive Camera app (for Android), Google Street View app (Android, IOS), 360 Cam app (Android, IOS), or Video Stitch app (Windows/Mac). Some of these apps will allow you to view the end product directly within the app. Others will require you to upload to a video platform like YouTube (no worries, you can list the videos as “unlisted” to maintain student privacy). Regardless of the option you choose, student engagement will increase.

Moreover, teachers will certainly want to use VR as a virtual science laboratory simulator where students can perform lab experiments and safely perform dangerous experiments in virtual simulation. To do this, the teacher could record VR video for a specific experiment ahead of time for students to view, or peruse the YouTube 360 video library for related topics.

In addition to lab simulations, students can use VR YouTube videos to view everything from medical procedures (including operations) in 360 to space exploration. For example, students can now participate in virtual tours of the human body using VR YouTube videos, allowing students to gain a deeper understanding of the human body. Add in related apps (there are many), students can also supplement their learning with VR glasses and an iPad while performing actual dissections or other lab activities.

Although only a couple of uses for VR YouTube videos for science were discussed here, there are many ways you can use them to increase engagement, excitement, and interest in science. It is also important to note that Virtual Reality technol-

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taking the creative leap

able to brainstorm responses that ask them to look at things from different perspectives, they develop the empathy needed to consider and combine multiple viewpoints. If they are able to offer their thoughts freely, they engage in the risk-taking that is needed to share new and different ideas. THP

Reference

socially scientific

ogy (and its closely related kin, Augmented Reality) is a viable career path for innovators in the STEM disciplines. So, enthusiastically embrace, use, and rejuvenate your science class in 360 VR. THP

References

curriculum corner

Choosing sophisticated curricular resources as a critical consumer of educational materials is essential. Consider the following elements of a curriculum unit and if these question components are present:
1. Additional Extension/Enrichment questions that provide more complexity,
2. Varied questions touching on all cognitive levels of learning and understanding,
3. Guidance and suggestions for how questions within the curriculum can be modified and adapted to be more complex as needed.

Enhancing opportunities for students to develop high-level questions is an important element in advanced curriculum design and delivery. Critically contemplating the use of questioning in the curriculum has the potential to enhance the critical thinking opportunities presented to students through advanced questioning. Educators should review the questioning sets in classroom curriculum for sufficiently advanced cognitive levels and increase the challenge level by evaluating and revising questions. THP

Additional Reading

special populations

support and share the message about specialized services
• Provide opportunities to allow students to demonstrate their giftedness in front of their peers (school programs, bulletin boards, class presentations, competitions, etc.) to increase their self-esteem
• Empower students with self-advocacy skills so that they can play an active role in determining what kind of instruction and activities are most effective for them

As our school districts improve efforts to identify and provide services for diverse gifted learners, the identification of ethnically diverse students with disabling conditions should also improve. To help with these talent search efforts, educators are encouraged to look more deeply at students who have been labeled with special or disabling conditions to determine if there are students within these groups who may also have high potential in a particular content area. These 3E students deserve attention for their gifts as well as the support needed to address their special needs. THP

References

Resources
Rivera, J. (Sept 2016). This bias may be hurting your gifted or 2e kid. www.jadeannrivera.com/implicit-racial-bias/