Using Edtech to Enhance Learning

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Allowing students to use technology in the classroom has been increasingly more popular as technology advances and becomes more ubiquitous. However, many educators wrestle several aspects of edtech, including, how to start using edtech (Caukin, 2018), when to use edtech (National Education Technology Plan [NETP], 2017), how to incorporate it without creating more distractions for students (Thomas, 2019), and ways that edtech can move students towards higher levels of thinking (Caukin & Trail, 2019). It is important for educators to provide opportunities for students to not only participate in effective and meaningful learning experiences, but also engage them, sustain their attention, and assess them in a variety of ways, all of which edtech can provide (NETP, 2017).

Activating Strategies

There are many ways in which edtech can be used to engage students. One way is in an activating strategy, which allows teachers to link content to prior knowledge or build background

knowledge by providing them with new experiences. It is important to have an activating strategy for each lesson, so the learner has an opportunity to gain interest in the topic in a fun and interactive manner. By using edtech in an activating strategy, teachers can draw students into their lessons by using tools students are familiar with and potentially passionate about. One way to use edtech in an activating strategy is through gaming. Gaming can allow students to use what they have already learned to complete informal pre-assessments in a fun and stimulating environment. For instance, the teacher can give an assignment the night before and the students go home and practice what they have been learning. The next day, using a gaming method in their activating strategy, the teacher can challenge students to apply what they learned from the assignment to the game, preparing them for the day's objectives and expanding that skill further. The students have so much fun during the game that they do not even realize they are reinforcing their learning. One enjoyable and beneficial edtech game that can be used in the classroom is Kahoot! This free, online gaming service allows teachers to make their own multiple-choice questions that can be used with low-stakes in healthy competitive environment. Teachers can even create question banks (or use the ones provided), which can make future games quicker to create. There are pre-made Kahoots! available for free. With a Pro subscription, teachers can use the puzzle feature, slides feature for providing more content, and the polling feature. There is an image library and an advanced reports option as well. With a Premium subscription, teachers can play school-sized games and use open-ended questions.

Polling is another approach that can be used as an activating strategy. Polling gauges students' interests and progress in real time and pre-assesses what students have learned before teaching a new concept. When using a poll, teachers can see what each student knows without singling them out. Polling also promotes students' awareness of their individual progress. Because polls are anonymous, the student is able to see how they are doing with new content without feeling the pressure of getting an answer wrong. For example, as teachers introduce a new concept, they can add one or more polls at the beginning of their lesson to monitor how well the information is being absorbed. It is handy for teachers to be able to see how well students are taking in new information individually and as a whole class. Teachers can monitor how well previous teaching has been understood by evaluating how students perform on the polls, as well as identify areas they should create scaffolding for during the coming lesson. Wooclap is a free online site that allows teachers to create their own polls as well as multiple choice quizzes, or open-ended questions. Other useful sites for polling include: Poll Everywhere, Mentimeter, and AnswerPad.

Brainstorming can also be used as an activating strategy. It is a way that teachers can encourage students to think about what they will learn in the future. Brainstorming as an activating strategy is an effective way to get students thinking about a new topic. For example, when introducing a new concept on the elements in chemistry, teachers could ask a question like "What is your favorite soda?" Then, students will become excited and interested in the topic of elements without realizing it. The key is to make your activating strategy as relatable and entertaining as possible so teachers can gain students' attention and keep it for longer than if they had just used a typical bell ringer. A useful tool for brainstorming as an activating strategy is Padlet.
With Padlet, teachers can post an open-ended question and students can see their own responses as well as those of other students. It can be anonymous, or students can add their names to their responses. Other helpful sites are: Tricider and AnswerGarden.

Instruction

Once students' interest has been captured through a meaningful activating strategy, online content can be made easily available through QR codes. A QR code is a matrix bar code that is scanned by any device with a camera (Apple products) or with a free, downloadable QR code reader. Once scanned, the QR code navigates the user to a pre-determined website. Teachers can vet specific articles, videos, etc. that they want students to use during the lesson to learn online content. Any website location can be used to make a QR code, even an edtech site such as Kahoot!, Poll Everywhere, etc. Making a QR code is easy, first search for a free QR code generator, copy and paste the URL of the site you want a QR code for, and then paste it on any electronic document, PowerPoint, etc. This form of technology can be used to enhance learning, because it saves time during transitions, so students can spend more time interacting with the material. QR codes give students easy and instant access to material and learning tools. Some recommendations include: https://www.qr-code-generator.com/, https://www.qrcode-monkey.com/ , and www.the-qrcode-generator.com.

Another edtech tool that is helpful when enhancing student's learning is Nearpod. Nearpod is a free website that allows teachers to create an interactive "PowerPoint." There is an upgraded version that teachers can pay for at a small cost that includes more options of slides and content to incorporate into presentations, but many features are available for free. All that is required to access Nearpod is an email address. When creating a Nearpod, teachers can import slides from presentations they already have or create new ones directly on Nearpod's website. Teachers also have the choice to create slides that allow students to draw, take a quiz, interact with 3D models, practice math or science problems, visit a website, engage in a discussion board, and the list continues.

When the teacher presents, they have their students visit Nearpod.com on their smart device, which can be a smart phone, computer, iPad, or tablet. The students enter the code provided after the teacher makes the Nearpod lesson live. The free version is teacher-paced which allows the teacher to control the slides which will keep all students on the same slide at the same time. The paid version allows for student-paced lessons, which allows students to flip through the slides and interact with the material at their own pace. Another one of Nearpod's features is that the teacher can choose a student's drawing, discussion post, etc. to display on the screen to discuss without showing the student's name. So, for instance, if a third-grade teacher used a Nearpod presentation for his or her lesson on the water cycle, the teacher could have the students draw a diagram including the 5 steps of the water cycle. Then, once the drawings are submitted, the teacher can choose one to display and discuss while maintaining the student's anonymity. Nearpod is a great tool for teachers of all grades to use in their classroom to promote student engagement and incorporate technology in the classroom. A comparable resource is Pear Deck, which uses many of the same tools, except it uses Google Slides and students and teachers must have a Gmail account to sign in.

There are numerous free edtech apps that can be used to help students with reading (ReadWorks, Whooo'sReading, Rewordify), math (Geogebra, Math Cats, Math Chimp), social studies (Digital Civics Toolkit, Smithsonian's History Explorer, Big History Project), science (Science Bob, DIY Sun Science, Phet Interactive Simulations), writing (NaNoWriMo), coding (Scratch), music (GarageBand) and other topics as well. Of course, there are many edtech tools that have a fee.

Assessment

Assessments are one of the most important parts of a lesson. It shows if students are mastering objectives and learning targets. The power of technology can be leveraged to administer assessments and analyze the data from assessments. Using technology as tool for assessment can save time, resources, and streamline the process as well as provide needed differentiation and assistive tools.

The edtech tools for informally assessing students during a lesson can take a cue from some of the applications discussed in the Activating Strategy section. For example, Kahoot! is a game-like assessment that is sure to engage students and assess them individually in a whole-class setting. Nearpod offers the option to embed questions into slides that can gauge learning. Using Padlet, AnswerGarden, AnswerPad, and Mentimeter allow teachers to capture students' thinking in the moment and make it visible to the class for further discussion and exploration.

Edtech can also be used for formal assessments. For example, a Google form can be created that allows options for question types and embedding of images or videos. Individual student answers can be viewed as well as the class as a whole. Responses can be exported into a CSV file and feedback can be given to individual students. Socrative is a free tool for creating exit tickets in real time. It engages students and provides teachers with feedback on student mastery. Quizziz is a free, self-paced way to review, assess, and engage students with single choice or multi-choice answers. Quizalize is a gameshow-like edtech tool that allows teachers to create assessments and track student results (there is a fee for tracking). Another helpful edtech tool for formal assessments is Plicker. This free, low-tech option uses printable paper cards as "clickers" for student-responses.

Feedback

With all the information provided on edtech tools in the classroom, an essential aspect of teaching and learning that needs to be mentioned is feedback. It is through meaningful and timely feedback that learning can be improved (Wiliam, 2016). Using edtech tools during an activating strategy, instruction, or assessment, teachers can provide real-time feedback to correct misconceptions, redirect, and promote deeper thinking. Many of the edtech tools provide instant data on student performance and some allow teachers to provide feedback to students individually. Nearpod and Padlet allow teachers to give feedback to questions instantly. Teachers can post or comment on each student's comment on the Padlet, which allows for a quick feedback to individual students. Nearpod allows the teacher to show students' work as artifacts of exemplary work or for common errors that can be used for whole-class instruction.

It is important to note that edtech should be used to enhance instruction, not replace the teacher. It is also encouraged that teachers check school and district technology policies and are ensure their students are using technology in safe, appropriate ways. Technology is growing increasingly more prevalent in today's culture, and it is important for educators to take advantage of the hundreds of resources made available to them and their students. Not only will utilizing technology influence the way educators teach, it will also increase student engagement (NEPT, 2017). Common Sense Education is a helpful site that can be accessed to read reviews of many edtech tools. This site provides pros, cons, the bottom line, and reviews from teachers. You can easily search the edtech tool you want to learn more about and then access the website of the tool.

By using edtech in the classroom, teachers may have the popular option of Bring Your Own Device (BYOD). Students love being able to use their devices during class and teachers know they are being used for educational purposes. Overall, using technology for education is extremely beneficial, not only when it comes to starting a lesson with an activating strategy, but also for instruction and assessment. Using these free online tools can not only add fun to teachers' classrooms during the activating strategy, instruction, and assessment, but also save them on material costs!

Resources

Answergarden - https://answergarden.ch/

Answer Pad - https://app.theanswerpad.com/homepage.html

Common Sense Education - https://www.commonsense.org/education/search?contentType=reviews

Digital Civics Toolkit - https://www.digitalcivicstoolkit.org

DIY Sun Science - https://www.lawrencehallofscience.org/do_science_now/science_apps_and_activities/diy_sun_science

Garage Band - https://apps.apple.com/us/app/id408709785?ign-mpt=uo%3D4

Geogebra - https://www.geogebra.org/?lang=en

Google Forms - https://www.google.com/forms/about/

Kahoot! - https://kahoot.com/

Math Cats - http://www.mathcats.com

Math Chimp - http://www.mathchimp.com

Mentimeter - https://www.mentimeter.com/

Nearpod - https://nearpod.com/

Padlet - https://padlet.com/

Pear Deck - https://www.peardeck.com/googleslides

PHET Interactive Simulations - https://phet.colorado.edu

Plickers - https://get.plickers.com

Poll Everywhere – https://polleverywhere.com

Quizziz - https://quizizz.com

Quizalize - https://www.quizalize.com

ReadWorks - https://www.readworks.org

Readwordify - https://rewordify.com

Science Bob - https://sciencebob.com

Scratch - https://scratch.mit.edu

Smithsonian's History Explorer - https://historyexplorer.si.edu

Socrative - https://socrative.com

Tricider - https://www.tricider.com/

Whooo'sReading - https://www.whooosreading.org

Wooclap - https://www.wooclap.com/

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