Podcast Transcript

In the Classroom 14

Using Augmented Reality in the Classroom

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Stan Skrabut: Welcome once again. Thanks for listening to my podcast. It certainly means a lot. As I always let you know, you could be doing other things, but you're hanging out with me and I really appreciate it. Today is another one of those topics from my multimedia development class. This time we're talking about augmented reality.

In the class, there was some confusion about the difference between augmented reality and virtual reality. A lot of the students in the class mix the two up. Wasn't sure exactly which was which. Today, we're going to talk about what the difference is. As well as how it's being used both in business and education and provide you with some ideas that maybe you could use in your classroom.

Let's get started. First of all, what is augmented reality? Well, we use augmented reality, almost everyday, especially if you're a commuter. Augmented reality is where you have additional contextual information overlaid on a real environment, whereas virtual reality is just the simulation of reality.

What do I mean by that? One of the best examples in my mind of augmented reality is a GPS. I use a program called Waze. Waze is a wonderful application. It provides me location-based information. As I'm traveling, it shows where I'm at, but additionally, it lets me know about hazards such as cars pulled off on the road, major potholes, animals in the road and other information such as traffic jams. If there is a traffic jam going on, it will give me information that will let me detour and create a route around that traffic jam which is absolutely wonderful.

Also, it lets me know where the police are. Now, it's not perfect because a lot of this information is based on other users of Waze called Wazers and I'm a Wazer. When I see things like a car off to the side of the road, I will use my phone and basically plot that point on the map to let other individuals know what's going on. You can certainly get points so there's a little bit of gamification involved in it, but it's a nice feature.

If I happen to see a police officer, I let the rest of the world know because we want them to slow down and be more attentive to the road. I am doing my civic duty. Basically, that's supplementing information. As I'm driving, I'm seeing additional contextual information being presented to me that gives me information about where I am and what I'm doing and it allows me to make better decisions. That is augmented reality.

Virtual Reality, on the other hand is when you're immersed into this world. One of the examples that I'm familiar with is called Second Life. Second Life has created this vast universe, vast world in which you immerse yourself in. There's various levels where

you actually have headsets that you are in a 3D world. Everywhere you look around, you are in that world. It replaces what your reality is. What you're seeing is replaced. That's virtual reality.

Each has their place, but it's really talking apples and oranges. Augmented reality is, I think, a lower bar or a lower threshold to get involved in it. You're seeing this happen everywhere because of games like *Pokémon Go.* You must be living under a rock if you have not heard of *Pokémon Go.* Basically, it's a game where people were running around with their telephones and they were capturing objects that were overlaid on real objects. It allowed them to collect points and such.

There's a game that I play called *Ingress*. Which is very similar that you capture territory based on capturing different overlays on real points in the world. Wonderful set of games allows you to use your mobile device and it supplements the world. It's just a lot of fun. If you've not tried those *Pokémon Go* and *Ingress*, I would encourage you to go out there and explore it to get a better understanding of what I'm talking about of this overlay on a real world.

Well, businesses are also figuring out how to do this. How to add supplemental content to either their advertisements or their products themselves. I'll tell you a few of those, but the way that you get involved in augmented reality is usually through your smartphone. Your smartphone or iPad, some kind of mobile device. In some cases that you would have glasses. Google's glasses, that was augmented reality where you could see information overlaid based on what you were seeing. That was pretty powerful tool, but I don't think the world was exactly ready for it yet. Slowly, but surely, we're finding a lot of use for this idea of augmented reality.

Basically, we're seeing or hearing information that is supplemented to what you're seeing in the real world. That is a little bit of what augmented reality is through your device. Typically, the GPS is a little different, but basically, as you're looking through your phone that you can see what's being pulled in through your camera. Normally there's an overlay that gives additional information or based on what you're seeing it triggers something.

Normally, augmented reality there is an event that occurs. It causes a trigger just to switch allowing you to then access additional content. Now, as we get better with this augmented reality, it becomes more seamless. In some cases like QR code or quick reaction code, that you'll pull up an application that allows you to see QR codes and something will as you look at the code, it'll tell you to open that particular object. Then you open it and it will take you to a video or take you to a document or some kind of information.

That's one trigger. You may have other triggers like in Google lens that is a dot when it sees it. You can look over normal objects. If it can identify it, it'll put a dot. When you click on the dot, it will give you additional information. Some information based on the trigger when it identifies it, it will play an object. A program called HP Reveal will do exactly that. You create a trigger based on an image, for example. Then you can play an animation, a video or something like that. It'll trigger once it identifies that image

and it'll move on from that. It's kind of a QR code in a way, but just add a next level. Like I said, once the triggers trip, then you have access to that content information.

Other triggers are based on geoinformation. If you enter a geolocation hotspot using this application, you may be presented with an opportunity to get more information. You can go with that. Why this is a low threshold to get into the apps are-- there's thousands of apps and the creation apps are relatively easy to use. More importantly, that there are cell phones everywhere.

According to EDUCAUSE and there are seven things you should know about augmented reality, their paper, that the use of nearly ubiquitous devices as cell phones may permit rapid experimentation and evolution of augmented reality applications. The trigger here is the fact that there's so many cell phones out there. The applications are really easy to use. You can have even students using them in your classroom to build these augmented reality triggers. From there, you can just keep building upon that. If you have a great idea for something, then this is pretty easy to get into.

There are some downsides to this and the EDUCAUSE's article talks a little bit about the downside. Most AR apps are very specific. In order to look at this planetary information, you need a special app. In order to use the constellation one, you need a different app. That's why there's thousands of apps. Tim Cook reported that the Apple store has over 1,000 unique AR applications.

One of the challenges that I see is that every time you do something you have to get a unique app or they have to subscribe as in the case of HP Reveal. That you can, for example, create a textbook that uses AR capability, but students will have to follow you or what you've created before they can use it. It's just not that you can just use it anywhere, anytime. Naturally the the bigger players like Google they have a little more control over that, but for someone like you and me probably, we need-- There's a couple of hurdles that people have to go through. They have to typically subscribe or download a special app to use that.

Some of these augmented reality apps also need special hardware that we just may not have. In most cases your

cellphone, iPad that'll work in most cases, but there are some special things that you may need additional hardware. Here's some examples of augmented reality that you may be aware of or not, but this is some of the things that are going on in the world. One example is in the military, a military aviator, they have what's called a heads up display or a HUD display, which sits in their view and now they're being built into their helmets where they can see basically information about their aircraft and how it's flying and all the gauges that are right in their viewfinder, right in their view screen.

It also provides additional information of where friendly and enemy aircraft are and other things that were related to the battlefield. Also dealing with the military that soldiers on the ground have also these type of, well they're working on it, these type of virtual displays where they can see information about the battlefield to identify where other forces are, friendly forces, enemy forces so we don't have friendly fire incidences.

They also can pull up their objective and basically have information at their ready so they can move much quicker in the battle battle arena. You may come to a museum where they have an application that by looking at the different artifacts through your phone, you can look at each artifact and it may present additional information about the history of that artifact and other information that would be useful to you that they normally could not provide because of the amount of information, that secure rate, that type of information and to build placards for it. To read about that information can get cost-prohibitive and this is a cheaper way of doing it. By building these AR applications where you can see this information in your phone and they can introduce a new artifact and right away they could have that information available to you.

In the medical world, doctors may be able to overlay an MRI scan on a body to be able to see things or x-rays, to be able to show where the broken bone or something like that. Be able to lay that over a person's body so it gives them better information. Also through special goggles or glasses, they would be able to maybe pull up a patient's chart or other information about a patient that would be useful at that moment in time.

Stores like IKEA have applications that allow you to visualize how a piece of furniture would look in your house so you can actually project through your phone or basically in your phone it would show what maybe a couch looked like or a dining room set would look like in a certain room, through one of these AR devices or clothing designer would able to show you what a certain piece of clothing would look like on you before you bought it.

Would it look good for example, there's a program called Encounter that will show you what a tattoo will look like on your body, wherever you want to put it, without putting the ink on because that gets a little permanent. You would be able to show that. Home Depot has an application that allows you to virtually paint your walls so you can get the right color schemes in the room that you want.

A wonderful example of how to use AR. Google maps, Google is working on augmented reality for its Google maps to add even more additional information to help you with its mapping program. There are other programs, I like aviation and aerospace education for example. There's a program called Lunar and Planetary that allows you to explore planets. They have pictures and you aim your phone at it and for example, bring up Mars and you can rotate Mars using your phone show where the different landings have been on Mars and a little information like that.

There's another program that I just absolutely love and it's called SkyView. With SkyView, I can hold my iPad up to the sky and it will align with the stars in the sky and show me where different planets are. It will show what the different constellations are and it allows me to identify the different stars in the sky just using my iPad and it's absolutely a rate tool and I love playing with it.

Other things that if you have a building and you're in the building, you may also bring up the blueprints of that building and it'll show where you are in relation to the rest of the building. Other applications are like for example in sports. If you ever watch football that yellow line that they put on there showing where the team needs to get to in order to get to a first down.

That's augmented reality. When they show examples of plays where route runners are, where the wide receiver is running their route. Once again, that's augmented reality. The sportscaster puts that information on the screen and it's just overlaid on what you see and that they're using augmented reality, which I think really cool. Other ways that it's being used, for example, in tourism that when you get to a landmark pending on where you are, there may be specific spots that allow your phone to give you more information based on where you're at and what you're looking at, what perspective that you have.

Lots of ways that it's already being used that you may not have thought of but once you start thinking about it as some of these examples that I mentioned to you made just suddenly realize what AR really is, what augmented reality really is. How can we use this in education? There's all kinds of great possibilities for using this in education. With a program like HP Reveal or using QR codes, and first I think HP Reveal is fascinating because you can get this Harry Potter effect for the books that you have.

If you remember Harry Potter that the newspapers suddenly came to life and what was the image would come to life. Well you could do this exact same thing using a program like HP Reveal. With the textbook that you can use an image, for example, in a textbook and then supplement that image with a video, for example, or an audio file that it allows you to give additional information. That's one way that you can make your books much more interactive or anything that you hand out. Recently I had a workshop for faculty and in that workshop I knew that I was going to go over a lot of information.

I put together a handout that had links but also QR codes. If they had their phone and a QR code reader, they could use that QR code to get to a video that I created walking them through the steps that I talked about in that particular lesson. That's something that you can do with the materials that you provide. If you are creating OER content, you can put a QR code that links to a video. It would also put the link in there, but you could have that QR code. If they had it printed, they could just pull out their phone, look at the QR code and it takes them right to that video. HP Reveal is a little more advanced and it will just start playing the video as it's looking at that image, which you have to see it because it's just absolutely cool how it works.

I'll add probably some of that into the show notes. Links to some of the things that I'm talking about. How else can you use that? Explanations to homework that you can have a math problem and then using HP Reveal, it takes them to a video that shows how to solve that problem. You can create something really fascinating with that. Book reviews that if students are reviewing a book, they could go ahead and create a supplemental material, this augmented reality material to do, say a book review with a video or something like that.

Year books, that can be supplemented with augmented reality to make it a lot more interactive in the way that if you're showing, say the football team or baseball team or basketball team or cheerleading squad or it doesn't matter, if you had video footage, you could have a picture there of that team running a play and then show that video of that particular play. Very cool. If say you're working in elementary or primary or even secondary school and you have a word walls, that you have definitions or not definitions, but words around the room that you can turn them into QR codes and make

them a little more meaningful. Not QR codes or even HP Reveal, but basically using augmented reality.

Lab safety, I've seen this used and it's really powerful that you could have these little QR codes everywhere talking about different pieces of equipment and their safety uses. You could use a QR code to look at, talk about safety for taking out and putting back the microscope, for example. That's just one example on how to use this. Sign language, flashcards, you could actually, for a specific word or a specific gesture, show what the actual gesture is and build flashcards that are doing that. One of my favorite programs that I use is called Plickers, and Plickers is a augmented reality type application that works like a clicker that students have a paper sign that has a special QR code and based on the orientation will result in an A, B, C, D.

They just have to orientate it the right way to get the answer you want, but you wave your telephone across the room and that will give them a certain response. I'm a huge fan of it. Let's see, it talks about, here's a great program, Google Lens. Google Lens is a program that is augmented reality. As you look at things with your phone, if Google recognizes it through its artificial intelligence and all the algorithms it has, if it recognizes it, it will let you know that it has additional information about that, so you click on it and it'll take you to that different information.

I just showed my wife this, we went upstairs, she's got houseplants everywhere and we were just looking at different houseplants and it would bring up what type of plant it was and other information about the plant are absolutely fascinating. Another program that Google has is called Google Translate. If you happen to be in a different country or you're seeing signage that is in a different language, you basically can take your phone, capture that image and it will translate it for you into the language of your choice. Another great tool.

Other things that you can do. One is you can build virtual field trips and in Google Maps and using Google earth, and that way if you share those field trips with other people, they will be able to see them on their phone and by clicking on them, it will give them additional information about what you want them to see. You could put together what are called lit trips, literature trips. For example, I just finished reading a *Huckleberry Finn* and I can follow the path down the river and add that as a literary trip that students could take a look at, for example, or it could be another author and the information that they have.

Those are things that you can do, our virtual field trips. Maybe in your town, often there's historical signs that you can create your own trip by supplementing those signs with even additional information and share that out. There's different ways to share it, but I think you can also share it publicly so that other people, if they want to follow that, they can add that to their list of favorites and be able to see that. KML or KMZ files that allows you to do that. The nice thing is, is you can continue adding to it.

This augmented reality is once you start building on it, you can continue to build it and continue to create reasons for people to use it. The nice thing is, is this is at such a low threshold that students can actually get involved and create real objects that other people can use using this idea of augmented reality. That is what I have for you today

on augmented reality. It's something that I play with all the time and I'm pretty excited about the different possibilities of it. With that real quick plug for my book.