Augmented reality enhances learning at Manchester School of Medicine

Gemma Ellis  Welcome to the Jisc podcast. The University of Manchester is taking a unique approach to prescription training for its medical students using a bespoke augmented reality app to support the learning process. Lead for prescribing, senior clinical lecturer at Manchester Medical School and general practitioner, Dr Kurt Wilson, and senior innovation developer at Jisc, Matt Ramirez, talk about the solution they’ve developed and how it’s enhancing learning and teaching.

Kurt Wilson  My name’s Kurt Wilson, I am lead for prescribing training at the Medical School in Manchester and I am also a part time GP.

Matt Ramirez  My name is Matt Ramirez, I’m the senior innovation developer in the future technologies directorate at Jisc.

Gemma Ellis  Kurt, can you tell me about the AR app you have at Manchester School of Medicine? Who is using it and how?

Kurt Wilson  Well we’ve been exploring the use of AR over the past three years or so. Our students all received an iPad and were asked to use this to support their study during their clinical studies in years three to five of the course. We really use the iPads in a number of ways to enhance our student learning, including AR, we’ve been using Junaio to enhance our posters with digital stories that are accessible via an AR link on the posters. It’s been used more extensively in some small group teaching more recently.

Gemma Ellis  Why was it you decided to go down the AR route? Had you seen someone else using it?
Kurt Wilson  I met up with Matt, I was introduced to him by my technology team here, and after he'd shown them some work that he'd completed with another faculty at our university, and I was really impressed with the way that he'd used AR to enhance the learning resources available to students and started to think about ways in which we could use the AR at the Medical School, so we're just beginning to implement some of the potential for the use of AR in the Medical School now, mainly with digital storytelling as I described with the posters, and also two day asset development for small group teaching. But there's obviously loads of potential for more complex use of AR in the future, for example with technology enhanced learning around 3D objects such as clinical equipment that we try and train our students to use, or with our anatomical models that we ask them to learn about, all with simulation that we do a lot with the final years.

Gemma Ellis  How easy was it to implement AR once you decided to use it?

Kurt Wilson  It was really easy with Matt's help. We found that once we'd created the content for our teaching it was easy to upload these onto a server space and then for Matt to enable the iPads to access the content that we'd created through use of AR. So yes, I was impressed with it actually.

Gemma Ellis  Matt, the same question to you please, can you tell me about the process of working with Kurt?

Matt Ramirez  So me and Kurt have got a longstanding relationship of collaboration within different projects, most notably iBooks, other interactive resources, and we talked about AR through a mutual colleague who put me in touch with Kurt. I guess the way that it works between us is that I'll come up with some sort of technology solution that I've seen and then Kurt will think about ways it could be applied to student cohorts, about what's realistic and how it can be scaled out, how it would benefit the student experience rather than just produce another way of doing the same thing. So that's something we really place a lot of emphasis on, making sure that it adds value rather than just replicates something that's already available on Blackboard or another platform. From the technology side it's been really good balancing what I think is possible or I think would be the best approach with Kurt's pragmatism. Although he's a proponent of using new technology it's good to have someone to focus on what's really important, i.e. having the students central and focused to their learning experience, and not concentrating solely on the technology.

Gemma Ellis  Were there any particular reasons for choosing the platform you did?

Matt Ramirez  Well, I chose the Junario platform having worked on it in multiple projects dating back to about 2010 to do with augmented reality in a variety of different disciplines. So I took that to Kurt and showed him some examples, and we thought it was best going forward with this because of the expertise that I've developed over the time and the way that, functionally, it was far ahead of any other solution on the market. Also, it has a very shallow learning curve for students to actually use the finished content, so it wouldn't provide an issue or a further issue to do with development of student skills.

Gemma Ellis  How did you go about building the app?
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Matt Ramirez  Well, Kurt came to me with a set of learning objectives, or maybe looking to enhance what was currently available via other mechanisms. So for one of the apps that we created it was simulating a patient and a student doctor, and also an examiner scenario so that there’d be three students involved in this role play and each of them would take one of those roles. The way that we facilitated this through AR was to give them notes relating to their particular character and they were playing it out with those notes in front of them. Previously this was quite a time consuming process because the facilitator would have to print out each of these role play scenarios to each of the people and remember to take them, but with this way it was a standardised experience, it could be easily adapted or amended going forward.

Kurt Wilson  We found it really useful for the students to be able to change role in the simulation by using their iPads to hover over different parts of their little simulation poster that we put on their tables, and then they get to see information about being an examiner or a simulated patient, or the information that they’d get before the examination station they’re training for as a student.

Gemma Ellis  Kurt, I’m interested to find out about some of the benefits that you’re seeing from using the app; can you tell me a little bit more about that please?

Kurt Wilson  We’ve really used the AR to help our students access more information in personal and small group learning environments, and it’s helped me to make sure that I can direct the students to material I need them to see and standardise this across multiple learning environments. This is really important for us because we’re a very big school, we’re one of the largest medical schools in Europe with nearly 2,500 students studying here, so we were trying to standardise the way that students were able to prescribe medicines and then examine them on this process across all of our various hospitals. The posters and the digital storytelling that we were afforded through the use of AR really helped us to deliver that message to all the students across the various hospitals.

Gemma Ellis  What has the feedback been from students and staff?

Kurt Wilson  It’s been really pleasing to see that our students have enjoyed AR, particularly in the small group learning for example. Responses from my students and staff members leading these small group teaching sessions was quite mixed at first, with predictable worries about use of unfamiliar technology and the negative impact this can have if it fails to work, but they’ve given it a go and it has been easy to access and it’s worked well, and they’re all pleasantly surprised, I think. They’ve also really enjoyed the fact that they can then also at the end of the session send examining instructions off to their email account so they can keep a record of what they were learning about and use that for reflection and further learning at a future point.

Gemma Ellis  Was there anything particularly unique or unusual about what was delivered at Manchester?
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Matt Ramirez
It was certainly unique in that Manchester Medical School was one of the first that was to implemented augmented reality, because I’ve been working with Kurt for over three years, so at that time it was a very infant technology, so there was a lot more scepticism than there is now. We tried to keep the experience very simple so that there wouldn’t be any learning curve the students would have to endure, so it was probably not our most complicated piece of work in terms of AR and prototyping, but in terms of the most effective and the most scalable it was probably the best in that respect.

Gemma Ellis
Do you have any advice for other medical schools looking to do a similar thing?

Kurt Wilson
Like any new technology, there’ll always be some early adopters in your school and those who prefer to stick to the tried and tested, but I think the main thing is that you need to make sure that you start small and that the feedback from your students is positive, because provided they’re happy then tutors feel more comfortable and the school runs more efficiently and everyone is pleased. Of course I think the other thing is the ease of use of technology, this is paramount for everyone – for developers, for tutors and for students – so I think they’re key messages.

Matt Ramirez
It’s about adding value and benefit to the solution which you offer them, so if the most appropriate use of an activity in a lesson is to hand a printed piece of paper to a student, there’s nothing wrong with that; I think we should always adopt the technology surrounding the activity that’s most appropriate. In cases where you need more active based learning, small group based learning, as Kurt has alluded to, I think it’s really good.

Gemma Ellis
Do you have any plans for future AR applications or other use of technologies?

Kurt Wilson
So Matt and I have been thinking about new ways to use AR in the future, and obviously one of the things we haven’t really fully explored yet is using the iPads to interpret 3D objects, which would be relevant to medical training.

Matt Ramirez
Yes, so me and Kurt have been thinking about developing 3D recognition and augmented reality which meant that we could use the anatomical models, but also equipment within the medical school, and overlay contextual information about how to use it, what to consider when using it with different patients and that sort of thing. In terms of the technology, I guess it’s still quite new, so we very much approached this I guess from a prototype stage, so nothing will actually be used with the students apart from to inform whether it was a good idea and whether it worked effectively. The other thing we were thinking of is using 3D printed models, so students could take those models home, either print them out at a 3D printer in the Medical School or somewhere like a Fab Lab, and then they can gain that surrounding information from that printed copy rather than having to be in the clinical skills lab or a specific situation or an environment. I think that really means that students can embrace this as an independent learning tool, they don’t physically have to be in a space to get the benefits of that learning. Anecdotally, I heard from a couple of dentists that the first year undergraduate students have no concept of the
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Kurt Wilson

3D space, so having something physically that they can interpret around and feel and touch is really great.

So really all of this talk about augmenting reality is in one way to make the learning experience better, but also to make it more portable, and one of the difficulties that we have with, for example, setting up a simulation lab is the space required, also all the personnel that you need to direct the simulations, and I think Matt and I have really seen some potential for AR and VR – virtual reality technology – to deliver these teaching sessions in other environments, that might be personalised learning that you could do with your friends at home or whether you could do some other work in small groups with just one tutor but not in the sim lab but still have some access to the sort of resources that we use in these scenarios.

Gemma Ellis

Finally, what would you like people to take away from this podcast?

Matt Ramirez

What AR can offer you is an insight into the things within medicine that you can’t always bring into context easily, so the unseen things, maybe the reactions that happen at a microscopic level – we’re talking about bacteria, antibiotics, how they interact with the body systems and that sort of thing. So it can allow the user more of a visual understanding of how things work at that macro level, which is quite difficult to comprehend when you’re reading it from the book or even watching an animation on a computer because it’s not self-guided then, whereas within AR you can decide the journey that you go on.

Kurt Wilson

I would say that it’s not limited to just understanding of microscopic activity but it’s also all about understanding how something works and how it might be used because you can look at the object from multiple dimensions – from the back, front, from the side – and different bits of information can be overlaid on your tablet as you’re looking at different aspects of the object in front of you, you can really enhance learning.

Gemma Ellis

Thanks both.

[ENDS]