Hello. My name is Dr Karen Guldberg and I am director of the Autism Centre for Education and Research at University of Birmingham in the UK. I’m going to talk to you today about technology-enhanced learning for children with autism. And I’m going to divide my presentation into two parts.

The first part is really going to summarise and look at what the research literature tells us about the benefits of technology-enhanced learning for children with autism, and in the second part, I’m going to talk to you about a project called the SHAPE Project, which I ran last year, and which was funded by the Economic and Social Research Council, and this is a project where we worked with teachers and children in school to embed particular technologies in the classroom and in the curriculum. And I want to signpost you to some of the stories, the digital stories, that have emerged from those teachers and children so that you can have a look at those if you are particularly interested in technology-enhanced learning for children with autism. So, when we talk about 'technology-enhanced learning', what do we mean?

Well, it is really what it says on the tin. It is about how we might use technology as a tool to support learning for children with autism. And there is a range of different technologies that are being used in classrooms today. There is also a range of different technological interventions that are being researched by researchers. And the technologies, they range from using iPads in the classroom, interactive whiteboards, computers, robots, mobile technology and mobile phones. So there is a whole range of technology that permeates all our lives these days. And for children with autism in particular, we know from research that there are huge benefits to using technology to enhance their learning. Not all children with autism are attracted by technology, but a very large proportion of people with autism are, and we have as a community been asking the question, why is this the case? Now, we think there are a number of reasons to why technology is so attractive to people with autism. We know for definite that it's very motivating for many people, but one of the reasons, probably, that it is very motivating is that technology is predictable. You know what's going to happen when you're using... or, largely, you know what's going to happen when you use the
A technological device. Often, software has made clearly defined tasks in a way that human communication doesn’t always have.

We’re not always as clear in defining the tasks that we give to our pupils in our schools, for example. Technology can reduce unnecessary stimuli as well, and one example that I like to use here is that it can reduce some of the sensory stimuli that often exists more broadly in the environment, in the sense of sounds that might be too loud or light that might be too bright. What technology can also do is reduce some of the social demands on the person with autism. So, for example, when we’ve worked with robots, we have found that the children tended to both initiate and respond to communication more often when they were working with the robot. And one of the reasons we think that this is the case is because when a person with autism, or when any of us, communicate with another human being, we’re trying to take in a number of different communication modalities all at the same time.

We’re looking at the person and we’re communicating through eye contact. We’re reading their body language. We’re listening to their intonation. There are all sorts of levels at which we’re communicating at the same time, and that can be very overwhelming to a person with autism. And what the robot can do is it can strip down some of that so that the person with autism can just focus on one aspect of the communication process. So, we think that’s a substantial reason to why technology can be more attractive to people with autism as well. Most software also gives very good visually cued instructions in a way that human beings don’t always do. And it limits language. Now, we know from broader intervention research that when human beings limit their language, reduce their language when they’re communicating with a person with autism, then that will often allow the person with autism to communicate back more and they will understand the communicative process better. So, we know that limiting language and reducing language is very important in the teaching of people with autism, and technology will often do that quite naturally.

Technology will also quite naturally - and I’ve particularly seen this in the robots - give the person with autism more processing time, and people with autism need more processing time, generally. So, if the technology naturally gives them more processing them, that could also be another reason to why it is an attractive medium for them to learn through. So, if these are the key reasons to why technology can be attractive to people with autism, we also need to look at, well, what are the kind of... developmental areas and skills, understanding that we can really teach people with autism through the use of technology? I’m just going to summarise some of the key areas that research has focused on in relation to using technology, and those are the following.

The first is social skills. There’s a lot of use of technological interventions to teach social skills these days. There’s also much use of technology to teach communication, particularly initiating and maintaining conversation. Recognition of faces and emotions - there are a number of different programs out there that try and teach children to recognise faces and emotions. There’s also a lot of software which is focusing on improving spatial planning, as well as daily living and functional skills, vocabulary, and reading skills. So, we can see that technology is often used to teach pupils much broader skills than just purely the academic skills, but it’s also focusing on developmental milestones that are important to pupils with autism. And I would make a plea, really, for that, that when we look at technology and how we use technology in the classroom, we need to think pedagogically
about what we’re trying to do, and I think it's very, very important to draw on best practice in autism education and fit technology use within that best practice.

In best practice, we know that structure is important, we know predictability is important, we know visual cues are important, but what we also know is that it's very important to work on and focus on the development of social communication and interaction in individuals with autism. So I would make a plea to really use technology and think creatively about how you can use technology to develop and enhance those skills, but also to use technology in such a way that encourages interaction with peers and enables collaboration with peers, because I think there are very, very many promising ways in which technology can do this. And this brings me on to part two of my presentation, which is just going to give you some signposts to some material where you can look at the stories that have emerged from teachers and children about how they’re using technology in the classroom.