ENABLE- ASC: ENABLING COLLABORATION IN THE ASC CLASSROOM WITH YOUNG CHILDREN AND TOUCHSCREEN DEVICES

Chrysoula Mangafa
Institute of Educational Technology, The Open University (United Kingdom)

Abstract

Young children with autism have many talents and special interests among which can be their affinity with digital technologies (Porayska-Pomsta et al. 2012). Despite the increasing use of mobile tablets in schools, and the motivation of the children to use them, there is limited guidance and research on how teachers use touchscreen technologies in the classroom to support children with autism develop specific skills, such as social communication (Kagohara et al. 2013). Specifically, the literature about the impact of teacher training on developing social communication skills in class is scarce (Mangafa et al. 2016). This study explored the effectiveness of iPad teacher training on improving teachers' practice and interactive style and the child's behaviour and engagement in joint interactions.

An action research methodology was followed at a primary special school in England, UK. Video recordings and semi structured interviews were used to collect data. Video recordings of four children with autism aged 10-11 were conducted as they interacted with iPads over a period of five weeks. Interviews with teachers were carried out to explore their experiences of teaching autistic children and using new technologies in their teaching. Teachers also participated in a training workshop to share experiences and learn about new ways of using touchscreen technologies in class.

Children were more actively engaged in joint interactions when using iPads with their teachers than without the use of technology. During the training workshop, teachers mentioned that discussions about iPad use and autism strategies grew their confidence and helped them reflect on their practice. Following the workshop, teachers were found to adjust their communicative style (e.g. by allowing time for the child to respond), make changes to the environment (e.g. by minimising distractions) and use resources (e.g. by using symbols/pictures) to engage with young children while using the iPad.

Teacher training on iPad use and autism specific teaching strategies is an effective approach that can improve teachers' confidence in using mobile devices in the classroom in more collaborative and engaging ways. Future studies should incorporate the active involvement of school staff and investigate their personal experiences in developing social communication skills in autistic children for the use of touchscreen technologies in real world settings.

Keywords: Teacher training, autism spectrum condition, technology in teaching and learning, social communication skills.

1. Introduction

Autism spectrum disorder is a lifelong neurodevelopmental disorder characterised by difficulties in a) social communication and interaction and b) restricted, repetitive behaviours (APA, 2013). It is one of the fastest-growing developmental disorders that affects more than 1 in 100 in the UK (NAS, 2014) and 1 in 59 in USA (CDC, 2018), which means that every teacher will at some point in their career teach a child with autism. Social communication skills do not often come naturally to children with autism, who may struggle to socialise with others especially in school. Despite the fact that early intervention targeting these skills is a widely researched area, studies using digital technologies in classrooms to support their development are few (Hourcade et al., 2013).

A systematic review of studies from 2009-2012 concluded that 'iPads are viable technological aids for individuals with autism and other developmental disabilities' which can be used to teach specific skills, such as communication, academic and transitioning skills (Kagohara et al., 2013). Yet according to the authors, no studies were discovered which investigate the potential of iPads for the development of social skills such as greeting, conversation and commenting (Kagohara et al. 2013, p.155).

Current social attitudes to the use of iPads and other tablet devices for supporting children with autism are contrasting. In a study of parental attitudes to iPad use by Fletcher- Watson (2015), parents reported that technology has helped their children with autism but that they were concerned about the amount of time their children spend on the device. Also, according to Clark et al.'s (2015) survey of 90 parents and 31 professionals about attitudes towards iPad use, iPads were more positively perceived by parents than professionals. The authors added that both teachers and parents needed training on how to use the devices as they lacked confidence and that evidence- based research investigating the benefits of tablets for the development of particular skills was needed.

Even though there are iPad guides in the market (CALL Scotland 2014, Foster 2016) as well as video tutorials and websites on how to use the iPad for teaching the curriculum and adjusting the device's settings (Hammersley 2016), there is still limited literature offering recommendations in the form of guidelines on how to use the mobile tablets for encouraging social communication skills in children with autism.

Mangafa (2017) addressed this gap in knowledge by developing guidelines in collaboration with teachers, parents, researchers, and professionals. These guidelines were used in this study as a teacher training material to explore the impact that iPad training can have on teachers' practice and children's social communication skills.

2. Methodology

The aim of the study was to investigate the potential that iPad training can have on primary school teachers' teaching practice and interactive style as well as on children's behaviour and engagement in joint interactions. The study was conducted in a special school in England, UK that caters for children with autism spectrum disorder and speech, language and communication needs. In this school, all teachers receive autism training as part of their induction course. iPads were recently introduced to support the curriculum but no training has been provided to staff. According to Ofsted (2018) report, staff understands pupils' needs and effectively adapts their teaching strategies to address pupils' emotional and social challenges. Two teachers and four children from a year 6 class gave consent to take part in the study. The children were aged 10 and 11 years old and they all had a diagnosis of autism. They were all competent communicators but had difficulties in socially interacting with others, taking turns in conversations and understanding social norms (e.g. when to naturally start or stop a conversation).

Initial interviews were conducted with the two school teachers to explore their understanding of social communication skills in children with autism and their experiences in using mobile technologies in the classroom. At the end of the study, interviews were conducted again so that teachers could offer their feedback on the training workshop and the impact this may have or not on their teaching and child's behaviour. The interviews were supplemented with class observations where the teachers were observed interacting with the pupils while using the iPads and other non- technology resources (e.g. books, worksheets, board games) for the duration of 5 weeks. An observation checklist developed by the author (Mangafa, 2016) was used to record the strategies that teachers used to gain, sustain and redirect child's attention (e.g. the use of visual supports, positive reinforcement, extra time allowed to answer questions, modelling the task) as well as the children's behaviour when initiating or responding to communication acts (e.g. keeping eye contact, responding to teacher's comments, asking questions). These observations were continued after the training workshop to note any differences.

During the training workshop a set of evidence-based strategies and recommendations (in the form of guidelines) (Mangafa 2017) about the use of mobile tablets was shared with the teachers explaining how, when and why to use this training material in their classroom. This paper presents the results from the interviews, the workshop as well as initial results of the observations' coding as observations are currently blindly coded by two researchers.

3. Results

3.1. Pre training interviews
From the thematic analysis of the interviews two major themes emerged.

Teachers' experiences of teaching autistic children: Teacher B.M. had been teaching children with autism for over 10 years while teacher K.L. has only started working in a special school this year, however she has been teaching children with autism in her previous role in a mainstream school more than 14 years. Teacher B.M. was offering training to school staff about autism strategies and delivering interventions for the development of social communication skills, such as Lego Therapy (the use of Lego bricks in a small group where children collaborate to build a model), and Socially Speaking (a social skills programme where children learn about social interaction and building relationships through play).

The teaching strategies mentioned were visual supports, a highly structured timetable, creating social stories, using positive reinforcement and offering rewards to engage learners and boost their confidence. Teachers' experiences of using iPads in school: They minimally used the iPads in school as they were not confident users. For instance teacher B.M. mentioned:

'Again I find teaching ICT lessons very difficult because there has not been enough training for non-specialist teachers. I don't have an ICT background,, so training in ICT lessons would be very useful'.

The teachers also mentioned that they need good ICT support to help them with the technical glitches, downloading apps and for ensuring there is good Wi-Fi connection in the classrooms. For instance teacher B.M. mentioned:

'We have an IT team based across the hallway that work across the trust, but I have always sensed there was a reluctance to put any new stuff on the iPads. Initially we were updating the iPads with new apps and then I think the IT team found it was not manageable. It is quite a busy job in a special school I think because there is a lot of work just managing the hardware, it just gets broken so much and damaged'.

3.2. Pre training observations

The teachers were observed interacting with the children in different lessons throughout the day for 5 weeks. Each teacher was observed twice every week. Initial results of the observation analysis showed that teachers did not offer many opportunities for the students to collaborate and interact with each other but worked independently on the iPads and the teacher was only helping them when they needed support.

3.3. Training workshop

During the training workshop, a booklet including teaching strategies and recommendations of tablet based activities were shared with the two teachers. The content of the guidelines was discussed and teachers expressed their interest in trying the tablet based activities and download the recommended applications to teach specific lessons that they had planned. Teachers did not give consent for the workshop to be recorded but they mentioned they would like to share the training material with their colleagues at the school.

3.4. Post training observations

After the training, teachers were more aware of how to structure the iPad lesson in order to offer more opportunities for social communication and collaboration. Both teachers created more interactive lessons and used more teaching strategies to engage the students. As a result of this, the children were more actively engaged in the lesson.

3.5. Post training interviews

Teachers were asked to reflect on their last lesson observation and discuss whether they were satisfied or not with the lesson, how the training may have or have not helped them and what their future plans are with using iPads in class. Both teachers were pleased with their lesson because the children were engaged and interacted with them due to them feeling more comfortable using the iPads to do their work rather than writing their answers on paper. Also the teachers frequently mentioned that after the training they were more confident to try new things and experiment with the iPads in class more often. For instance teacher B.M. mentioned:

'I think the training material gives us something to refer back to if we need new ideas. It's also created this conversation between me, Kate, Nat and the IT team that, you know, "we've done this, we need paid version of Book Creator please. We have these machines, let's actually use them for lessons properly.'

Also, teacher K.L. mentioned:

'So, I was pleased with how it [the lesson] went, yeah. And it's probably something I ... before talking to you and before the training I probably would have felt a bit nervous of doing all of that in one session but I think actually it helped it run more smoothly because of typing things in can lead to frustrations for them and actually it sent them straight to the link.'

Teacher K.L. also commented that the teaching strategies mentioned in the training material helped her reflect on her teaching style and she followed the advice on giving more structure to the lesson and clear instructions by for instance using a now (a symbol showing what the child is currently doing) and next (an image of what the child does next) visual board.

However this was not the case for the other teacher as she mentioned she already knew the teaching strategies mentioned in the workshop. But she mentioned that her behaviour changed when she

was using the iPad with the children. For instance, when teacher B.M. was asked whether she changed her teaching style she mentioned:

Yeah, I kind of want to say that I probably haven't but then you do probably behave slightly differently in a lesson that involves the children using a device. In terms of the way I communicate with children, probably not. I mean some, interestingly, might find it easier, that we're both staring at a screen as opposed to them having to look at me. So, that might be easier. I mean, I kind of slightly noticed that with Charlie that when he's showing me his work and all he has to do is actually look at the screen and he knows I'm looking as well, that's a little bit easier than having to interact with me one on one.'

At the end of the interviews when teachers were asked about their future plans they mentioned that the training workshop made them be more active and make plans what apps they would like to buy and share good practice with fellow teachers.

4. Discussion

This study showed that iPad training can boost teachers' confidence in using the devices in class to encourage collaboration and the development of social communication skills in children with autism. It was also shown that children were more motivated to interact with their teacher while they were using the iPads. However, it was expressed that reliable technical support, ICT resources and ongoing training and positive attitudes to technology use are all necessary factors for a smooth implementation and integration of iPads in the classrooms.

This is supported by previous findings. For instance, Clark and Luckin (2013) mention that technical infrastructure, such as ongoing maintenance and network availability, and the pedagogical use of the device are equally important for an effective technology adoption in schools. Burden et al. (2012) evaluated a pilot study in which four schools (two primary and two secondary schools) in Scotland were loaned tablets and notebooks for one year in order to investigate the impact and potential of mobile devices to learning. Online surveys, interviews, observations and documentary analysis showed that teachers, even those who were not confident in using the devices, were positive about the benefits that the mobile devices can have on pupils' learning. Pupils were engaged and motivated to collaborate and do research and creative based activities, such as making movies and animations. Technical problems, such as network failure and lack of digital storage, as well as lack of digital resources were common in the schools; nonetheless over the course of the study, teachers' levels of confidence and comfort in using the devices grew and many teachers engaged in CPD (continuing professional development) opportunities. The authors suggest that as the use of mobile devices, such as iPads, is increasing, senior school leaders should consider changing teachers' attitude and engage parents in the pupil's learning.

King et al.'s (2014) descriptive study explored the use of iPads and mobile applications by 6 children and young adults (aged 6 to 20) in a special school. Naturalistic observations over a three month period yielded 28 clips for coding where the participants used an iPad each and 28 different apps (AAC, academic and games apps). A teacher was not always present, but when they were they either offered physical prompting to the pupils to show them how the app works, modelled the task or acted as a communicative partner. The pupils used the AAC apps to communicate with the adults during snack time, the academic apps to practice their literacy skills and the games apps during break time or as a reward. The authors suggest that further research is needed to check the effectiveness of the iPad in supporting individuals with autism. In particular, they recommend that teachers should receive training on how to use evidence-based strategies with the use of an iPad to increase their competence in evaluating the effectiveness of the apps and the device in supporting their learners.

In addition, Clarke and Svanaes (2014) suggest that teachers should receive initial and ongoing training on how to not only operate the device and its associated applications (e.g. how to download apps and project the iPad screen), but also on how to incorporate it as a pedagogical tool in teaching and learning (e.g. teaching activities and lesson plans with recommended apps).

Technology is part of our everyday life and children cannot be prevented from using it. Instead adults who work with children with autism should consider when, how and why the children should use iPads (Clark and Luckin 2013, Fletcher-Watson and Durkin 2015). It is recognised that there is a lack of guidance readily available on how to use iPads for joint attention specifically and therefore this was addressed by this study. The author acknowledges the limitation of this study that it was conducted in a specific school in UK with a small number of children in a class but results were not intended to be generalised.

The current study adds that training workshops on how to use iPads with children with autism for improving social communication skills is a promising area for further exploration. It is suggested that more research is needed to investigate the potential of iPad training workshops as a participatory research method to improve teacher's practice and children's social communication skills.

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