Dissertation

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How has technology impacted the educational experiences of children in KS2 over the past twenty years?

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Statement of originality

I confirm that I have fully acknowledged all sources of information and help received
and that where such acknowledgement is not made the work is my own.

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Acknowledgements

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Abstract

The aim of this research project is to discuss the effects of technology on the educational experiences of today's young people, with focus on KS2. This includes internet use on a personal level, including information regarding the effects on mental health. The research aims to highlight how this has changed in the last twenty years During this time, technology has been integrated into society, including the education system. This has obviously altered the way that students are taught. This paper aims to discuss as many points of view as possible, with focus primarily being on the positives and negatives of this concept. This is a secondary study; all the literature reviewed to help create a fair and balanced discussion

Chapter 1 – Introduction

The topic that I have chosen to research for my final research project is technology and how it has affected education within the last twenty years. My main focus will be on how the use of technology has affected the educational experiences of children in Key Stage Two, in particular. I have chosen to research this subject for several reasons. The primary reason I have chosen this subject is personal interest.

I am guilty of using my mobile phone far too much. The first thing I do when I wake up is check my phone. It is a bad habit but one that I cannot seem to change at the moment. The rush of excitement that checking for messages on my various social media accounts in the morning gives me is addictive enough to ensure I do it nearly every day. However, I have noticed that on the odd day when I do not do this, I am usually more productive. I firmly believe that lying in bed, scrolling through social media in the morning affects my mood and makes me feel lazier. Whereas if I wake up without doing this, I feel more motivated to start the day and generally achieve more. I am going to discuss this further in my research to assess the effects of technology and social media on young people.

I am aware that I have not been alive long enough to notice a change in the use of technology in education in the last twenty years as much as an older practitioner might have. However, even in my lifetime and educational career (as a student and a teacher), I have noticed a difference.

Technology has advanced so much in recent years and is continuing to do so. On August 6th, 1991, the World Wide Web became available to the public and essentially changed the world (Hern, 2019). Fast forward nearly thirty years and the internet is an integral part of modern society. Children born in the late 1990's onwards are often referred to as Generation Z (Dimock, 2019). Due to the enormous digital growth that has occurred in their lifetimes, Generation Z are mostly known for having a better understanding of technology than the older generations that have come before them. I personally fall into this generation and can remember occasionally using computers in primary school, and very rarely being able to play a game of solitaire on my Dad's computer. This escalated in secondary school where many lessons involved using

computers, including carrying out homework tasks, which prompted me to purchase my own laptop computer. Even since I left school, the use of technology in education has escalated further.

Within my research project, I am going to discuss the uses of technology within the classroom and the effects they are having on pupils. The aims of my research are as follows:

To discuss the positives and negatives of technology use in KS2 classes.

To address the various issues associated with young children using the internet.

To explore the existing literature on the subject, and critically analyse it.

The growth of the technological world is rapid and ever-changing. It affects us all, but I am most interested on how it affects the younger generation and if it will have any long-term effects on their generation. During this research project I am going to investigate whether there is evidence to support this. This is why I believe that this topic is important and needs to be discussed. I hope that my research can add some further insight into the use of technology in the classroom, and in particular, the impact it has on KS2 pupils.

Chapter 2 – Literature review

2.1 The iGeneration

Children born from the mid 2000's have been born into a world where technology is rife and have never known the world differently. The internet means that people can find out complex information within seconds. A few clicks of a keyboard and an answer to any question one might have will be there. More specifically, children born in this time (from 1995 – 2012) fall into a category called Generation Z or the 'iGeneration'. (Twenge, 2017). The 'I' in this term refers to internet or Apple products, which are well known for having an 'I' at the front. For example, 'iPhone, iPad, iPod'.

Twenge (2017) extensively examined the lives of adolescence between the years of 1976 and 2018 and compared them to the lives of the previous generations. She concluded several things. Her research found that the iGeneration are growing up more slowly, are less religious, are less likely to go out with their friends and that their primary social activity is social media.

Twenge (2017) argues that the complete dominance of smartphones in young people has had a ripple effect across the iGeneration's lives from their social interactions to their mental health. She found that extensive use of technology can have a direct impact on a young person's happiness. According to Twenge, young people are left feeling isolated and disconnected from the world when using a lot of screen time. She suggests that screen time can cause less sleep, leading to anxiety and poor mental health in general. She also argues that mental health professionals need to take this into consideration when counselling today's young people.

Researchers have found that 'iGens' are suffering with unprecedented levels of anxiety and depression, not seen before in previous generations (Leanza, 2018). Leanza (2018) highlights that this generation are the first to be born entirely into the age of the internet. They are also the first generation to enter adolescence with smartphones in their hands. The correlation between internet use and poor mental health in young people is something that I am going to discuss further in my research.

It could be argued that the use of social media and technology has a direct impact on writing/reading/comprehension/speaking skills. This is because nothing substitutes for interpersonal interaction. This is one of the issues that I will be studying during my research, as I believe that we are becoming too reliant on 'auto-correct' spell-checkers. This is as opposed to when previously faced with a word of which the spelling was not certain, people would have to look it up in the dictionary. I believe that by becoming more reliant on digital tools, we are becoming lazy and not having to learn to spell properly – this is a big concern for future generations.

However, there are many benefits to technology use. The first being that modern technology allows young people to keep in contact with friends and family from around the world. Video chat applications such as Skype, Facebook messenger, Snapchat and Instagram (to name but a few) allow young people to keep in close and constant contact within anyone they choose. This is often viewed a positive influence however there are many arguments for why it is not.

Issues associated with technology are obviously a very modern problem. Therefore, any literature that there is on the subject is also fairly modern. There has been much written online about the use of technology use in the classroom, from positive and negative points of view. Much of this literature was written in the last ten years, which limits the amount of literature I can review. Part my research will be based on journals, reports and government legislation, but the majority will focus on the writing of prominent figures within the field.

2.2 Internet use at home

2.2.1 Barnardo's

The children's charity Barnardo's (2019) conducted some research highlighting the effects of the internet and social media on young people under the age of eighteen. They surveyed some of their own practitioners in order to gage an idea of these effects. The practitioners that were surveyed were eighty support workers from thirty Barnardo's projects around the United Kingdom. The findings of the research showed that some children started looking at social media at as young as two years old. Half of the practitioners that were surveyed said that they had worked with children between the ages of five and ten years old that had been exposed to inappropriate or harmful

content online. The report found that a third of this age group have also been victims of cyberbullying. Most of the young people that are in the care of Barnardo's are particularly vulnerable individuals, therefore the findings of the report could be more extreme than the results I will produce.

2.3 Mental Health

I will be discussing the impact that technology has on the mental health of young people in my research. Technology and social media allow people to assume a different identity and pretend to be someone they are not from behind a screen. Unfortunately, in some cases, people abuse this element and demonstrate harmful behaviour such as cyber-bullying. This subsequently links into the issue of mental health in primary schools. I will be looking into and referring to government legislation regarding mental health, and what provisions are in place to tackle the problem in schools. Poor mental health is believed to be responsible for an economic and social cost of £105 billion a year in England (Public Health England, 2018).

2.3.1 The White Paper

During my research, I read a government document called the 'Online Harms White Paper' (Department for Digital, Culture, Media and Sport, 2019). The paper expresses the government's plans for promoting online safety and proposes ways to do this. While the papers primary concern is protecting people from the dangers of the internet, it also supports the thriving digital economy. The paper consists of legislative and non-legislative measures that aim to encourage companies to be more responsible for users. The main focus group of this is children and vulnerable people.

The White Paper highlights a number of harms that children experience online. These include child sexual exploitation and abuse online, serious violence and cyberbullying. The paper states that harms like this can impact on the mental health and wellbeing of the most vulnerable children and young people. It is for this reason that the White Paper proposes that the government take action.

The Online Harm White paper proposes a law being established in which duty of care towards users is the primary focus. This will be overseen by an independent regulator. The paper also proposes the notion that companies will be held accountable for tackling online harms. They will be expected to monitor closely and act accordingly

when online harms such as illegal activity, or activity which could be deemed as harmful.

The White Paper itself states that "The government wants the UK to be the safest place in the world to go online, and the best place to start and grow a digital business. Given the prevalence of illegal and harmful content online, and the level of public concern about online harms, not just in the UK but worldwide, we believe that the digital economy urgently needs a new regulatory framework to improve our citizens' safety online. This will rebuild public confidence and set clear expectations of companies, allowing our citizens to enjoy more safely the benefits that online services offer".

I believe that the White Paper is a very important piece of writing. The ideas that it promotes provide a sense of hope for the welfare of people (children in particular) on the internet. It is a fairly recent piece of writing, having been last updated in July 2019. However, the only drawback of this paper is that it is simply a proposal and is not necessarily going to be enforced. If the suggestions of stricter online regulations were to be enforced, then it would be a more valuable piece of literature.

2.3.2 Children's access to and use of the internet

In 2019 the Government published a paper called 'Children's access to and use of the internet'. The paper states that in 2017, the percentage of all children using the Internet from home was highest among 15- to 18-year-olds, at 78%, followed by 11- to 14-year-olds at 68%. Next were 5- to 10-year-olds with 57% and finally 3- and 4-year-olds with 45%. The paper found that there was a higher percentage of children used the Internet at home in 2017 than in 2010 64% versus 58%. However, the results showed that this was not a consistent theme amongst the age groups. The results showed that throughout this period, the percentage of children using the Internet from home was higher in 2017 than in 2010 for children ages 3 and 4 (45% and 19%) and ages 5 to 10 (57% and 49%). This contrasted to the statistics for older children, where the percentage was lower in 2017 than in 2010. This was evident in children ages 11 to 14 where the percentages were 68% and 72%. However, for young people between the ages of 15 and 18, the percentages were not different between 2010 and 2017 at 78% in both years. This is interesting as it demonstrates an increase in much younger children using the internet. Personally, I find the results slightly disturbing as that means that almost half of all three to four-year old's use the internet. This coupled with

the information regarding internet addiction in children as young as two is quite shocking. There is lots of harmful content available on the internet, although I am aware that there are tools that enable a parental lock on what children are watching. However, there is still a chance that young children could be exposed to potentially damaging content by mistake, and this could have catastrophic effects.

2.4 The National Curriculum (2013)

The Department for Education published an outline for use of Information Technology in the classroom, in 2013. The publication emphasised the importance of children learning how to use technology in order get a job in the future. In this age, most jobs require a basic knowledge of technology. This is because most people are assumed to own smart-phones or laptops of some description. This is especially prevalent in the younger generation, who are often known as the 'iGeneration', who are the most avid technology users.

The National Curriculum (2013) states that:

"A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems, and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world" (Department for Education, 2013).

The expectation for Key Stage Two children of today to be "digitally literate" (Department for Education, 2013) is vastly different to the expectations of children born before the 'iGeneration'. Key Stage Two children are now expected to have an understanding of technology at a level that allows them to become "active participants in a digital world" (Department for Education 2013). Smeets and Mooji (2001) claimed that Information technology acts as a tool for providing diversity in the curriculum and noted the opportunities that learning content and tasks can be tailored

to the specific needs and capabilities of each individual pupil. This provides pupils with an equal opportunity to teacher aide, should they require it.

2.5 Alan November

Alan November is an internationally recognised author and figure within the field of education technology. His work has acted as a guide for education leaders and government organisations around the world. November is an advocate for technology-based learning and has helped improve the quality of education through this. School design, curriculum planning and staff development are amongst his areas of expertise (November, 2019).

November's work is often viewed as influential within the world of education technology, so I feel that it is important to include it in my research project.

2.5.1 Who owns the learning? (2012)

Who owns the learning? is a book written by Alan November in 2012. It acts as an instructional guide for readers (primarily teachers) and encourages them to welcome the ever-changing technological world, incorporating it into their classrooms as much as they can. However, the book also encourages educators to let the pupils explore their own learning, embracing their natural learning curiosity.

2.5.2 Key terms

Digital Learning Farm

The idea of a 'Digital Learning Farm' was first presented in *Children as the contributors* (November, 2008). November explains that once upon a time, when the landscape was filled with farms, children were expected to undertake small (but essential) job roles to support their families. These roles included caring for the farm animals, as well as preparing food to sell at the market and were vital to the survival of the family. These jobs helped children understand the importance of hard work, leading them to become good citizens in adulthood.

Eventually the work of children was replaced by machinery. In order to support the industrial economy, children were expected to attend school. They became more

passive figures within the community, with teachers becoming the key figures within their lives. November argues that this shift in dynamic contradicts the fundamental human need to contribute to society. He states that we have now come full circle due to globalisation. He adds that because of technology, children now have important roles to play within the community once more. Furthermore, he proposed six job roles for children within the classroom, which make up the Digital Learning Farm model that are at the core of his ideology. These are as follows:

<u>Tutorial Designers</u>

A proposal that teachers should use software that allows pupils to record their screens, giving them the ability to share their work with others to help them learn.

<u>Official Scribes</u>

Students that record notes well should have the ability to share these with their peers using technology.

<u>Researchers</u>

A suggestion that pupils (one each day) should be responsible for using the internet to find the answers to any questions the class might have.

<u>Collaboration Co-ordinators</u>

Websites can be used to establish working relationships with other schools. Experts can communicate with students using video calls to share knowledge. November proposes discussions with classes overseas on important issues such as history and literature.

<u>Contributing to society</u>

November encourages teachers to enable their students to seek out investments to contribute to, making a small but meaningful difference in the lives of others. This can be done using social responsibility websites.

<u>Curriculum reviewers</u>

As these resources come together, pupils come together as a team to review them and create something that can be referred back to. This could be a presentation or a podcast, for others to download and share.

<u>Self Directed Learning</u>

Self-directed learning is a learning strategy where the students decide how they will learn, with subtle guidance from the teacher. This can occur in group settings or within independent learning. The key concept is that the students are in charge of their own learning (Sheng et al, 2005).

2.6 Marc Prensky

Marc Prensky introduced the term "Digital Natives" (2001) to refer to children born today, in the digital age. He argues that children born now learn differently from the generations before them, who Prensky refers to as "Digital Immigrants" (2001). Prensky (2001) suggested that the natives live and breathe technology and understand it completely, having known it their whole lives. Whereas, the immigrants have had to adapt and are still learning about technology, still a very alien concept to some.

The digital age is a fast-moving, ever changing world. While pranks (2009) has somewhat moved away from his immigrants/ natives argument, the terms themselves remain popular. The terms frequently appear in in articles, blog posts, columns and most frequently books (Bennett, Maton, & Kervin, 2008) The terms also often appear in literature studied in a higher education context (Jones & Shao, 2011).

Chapter 3 – Discussion

I decided that the best course for this research would be a library-based study, based on secondary research. This is because I believe there is enough literature in existence to weigh up the positives and negatives of the subject. The literature that I found was quite diverse, with contrasting opinions throughout. There are arguments supporting the use of technology in education but there are also those questioning it. It is because of this that I believe I can assess this literature in a fair and unbiased way. The two opinions that contrast the most are that of Marc Prensky and Alan November. In order to get a better understanding of the topic, I will be analysing these two works in particular depth. I will be analysing the purpose of the literature as well as the clarity. I will be taking the date of publication into consideration, to show that I understand how attitudes can change throughout the years. This element is particularly important in this research. This is because, as mentioned earlier, the technological world is ever-changing. This has been particularly evident in the last ten years; therefore, this will be taken into consideration throughout my analysis

3.1 Support for technology use in the classroom

3.1.1 Alan November

Alan November is a prominent figure within the field of technological education. He has lectured all over the world and his influence can be seen in many countries. His vision for education is one shared by people all over the world. He is of the older generation but has seen the potential in harnessing the powers of technology for good. It could be argued that his status as an older man means he has enough experience to be credible. It is because of this that I have chosen to review his thinking for my research. He has enough credibility to be deemed a valuable source within this subject. According to the NMC Horizon report (2017), technology use in the classroom is about "generating a deeper understanding of the digital environment, enabling intuitive adaptation to new contexts and co-creation of content with others."

Alan November is what could be deemed as a technology enthusiast. Collins and Halverson (2018) suggest that there are two key arguments that technology enthusiasts make for the importance of technology in education. The first is that the world is changing and that we need to adapt schooling to prepare children for the world they are entering. The second is that technology in the classroom gives us enhanced

ability to educate learners and that we should embrace this to reshape education. Alan November (2012) supports both of these arguments in his work.

November's book "Who owns the learning: Preparing students for a digital age" (2012) is an instructional text providing teachers with ways to use technology in Education. It is fairly modern which means that the ideas are still relevant and not outdated. The purpose of the literature is to educate teachers on the world of technology in the classroom. November highlights the benefits of technology in education and offers advice on how to harness this information, incorporating it into their classrooms. Although the case studies in the book are focused on older children, it can easily be transferred to apply to primary school teachers. All the case studies included in the book are relevant to all students and accessible to all. There is no need for extra resources, all of November's proposals can be applicable to all. The text includes websites and QR codes throughout so that the reader can analyse the results from the case studies themselves. This detail of involvement makes the reader feel understood. They can make their own assumptions and draw their own conclusions.

November backs up his beliefs with case studies with examples of where teachers have "owned" the learning, using technology. He focuses much of his writing on his idea of a "Digital Learning Farm" (as defined in the literature review above). November uses his own experiencers as an educator to relate to his audience, who are primarily teachers. This gives the book a sense of realness, as the reader can relate to it. This style of writing could cause some controversy. This is due to the amount of opinion that the book contains – this could be viewed as biased. He adds a number of questions in each chapter which allows teachers to treat it as a form of workbook whereby they can adapt the concept of the "Digital Learning Farm. November (2012) concludes that "given the right opportunity, tools and teacher guidance, students want an equal voice in directing their own learning".

November begins the text by recounting a story about his youth when he was a teacher that did not understand the purpose of technology. He notes his reluctance to adopt information technology and relays how he overcame this. Through interactions with his students, he was able to adapt to this strange new concept. He tells a story of his interaction with a student called "Gary". Gary gets in trouble for breaking into the computer lab. November recalls his reluctance to punish the boy because he learns

that the reason was to finish a computer program. November is shocked by this. He is more interested in Gary's fascination and dedication to technology, a concept which at this time, November did not understand. This is a notion that some teachers might be able to relate to, especially if they are of an older generation.

Although there are many helpful elements to November's work, there is a distinct lack of guidance for instances where students are reluctant to participate. November's assumption that all students will participate willingly could be deemed naïve. His positive and optimistic outlook is admirable, but also takes credit away from this text as a fair argument.

November shares a view with John Dewey (1998), wherein they both believe that teachers should act as a facilitator, allowing students to discover things for themselves. Dewey was an advocate for discovery learning and learning through experience. This could be applied to November's theory of technology education because he believes that children should be in charge of their own education. be November emphasises that the teacher needs as much preparation as their students for surviving in the digital age. November also reiterates the importance of adapting to technology in this age or risk being left behind. In an age where change is occurring all the time, the reader can use this learning model to adapt to and overcome any obstacles that appear in their teaching methods.

3.2 Support against the use of technology use in the classroom
3.2.1 Marc Prensky
At the opposite end of the scale to Alan November, is Marc Prensky. Marc Prensky is an American author, speaker and educator. He is currently the founder and executive director of the 'Global Future Education Foundation and Institute. He has lectured all over the world and has years of teaching people of all ages. It could be argued that this makes him a reputable source, having experience within the field of education. Prensky's 2001 publications in which the terms 'Digital natives' and 'Digital immigrants' were introduced are frequently used in the argument against technology. The model was primarily aimed at educators. The aim of the text is to highlight that technology exposure from an early age can fundamentally alter the educational experience of young people. The assumption that the older generation or "digital immigrants" will never be able to fully grasp the concept of technology could

be deemed controversial. Prensky suggests that because young people are born into a digital age, they are automatically gifted when it comes to technology. Bennet et al (2008) point out that generalisations such as these can be dangerous.

Prensky (2001) suggested in the new digital age, there were now two kinds of content: "Legacy" content (to borrow the computer term for old systems) and "Future" content. Prensky (2001) wrote that:

""Legacy" content includes reading, writing, arithmetic, logical thinking, understanding the writings and ideas of the past, etc – all of our "traditional" curriculum. It is of course still important, but it is from a different era. Some of it (such as logical thinking) will continue to be important, but some (perhaps like Euclidean geometry) will become less so, as did Latin and Greek. "Future" content is to a large extent, not surprisingly, digital and technological. But while it includes software, hardware, robotics, nanotechnology, genomics, etc. it also includes the ethics, politics, sociology, languages and other things that go with them. This "Future" content is extremely interesting to today's students".

Prensky's theory is highly anecdotal and not based on science which although interesting, lacks credibility. This has brought much criticism, with people pointing out that people can be less competent when it comes to technology for reasons other than their age. Other reasons included a lack of access to technology.

Others would argue that the lack of evidence in Prensky's work has not stopped it from gaining support from people all over the world. Many theorists cite this in their works regarding controversy within the technology in education argument and it features in political and educational arguments frequently. It could be argued that this partly what gives it credibility (Helsper and Enyon, 2009).

Helsper and Enyon (2009) examined what makes somebody a "digital native". They defined a digital native as".

"someone who comes from a media rich household, who uses the Internet as a first port of call for information, multi-tasks using ICTs and uses the Internet to carry out a range of activities particularly those with a focus on learning".

Their research found that young people have more access to new technology and use the internet more than the older generation. However, they also found that there are more factors than just age in the natives/ immigrants' argument. Some people

would argue that Prensky's digital natives/ digital immigrants argument gained popularity due to the sheer blunt nature. The two groups are vastly different, and this makes for an interesting argument. It makes the reader ask questions and think about it.

As mentioned in the literature review, Prensky has somewhat moved on in his thinking since the Digital Natives/ Digital Immigrants argument. Due to times having changed a great deal since it was published in 2001, the argument could be seen as outdated. It is, however, the fact that it is still used I debates today that it still carries significant value in the argument for and against technology use in the classroom.

Chapter 4 – How does technology affect the educational experiences of children today?

During my research, I found that there are six main ways in which technology has affected the educational experiences of children over the last twenty years. Here I am going to summarise and review them.

4.1 Interactivity

The first way in which I found that technology has impacted the educational experiences of young people is that lessons in today's society are more interactive than previous years. Most classrooms today have had traditional whiteboards and black boards replaced with touch screen boards. Children are more likely to rely on the support of devices such as laptops and tablet to accommodate their studies. Textbooks bare less value because information can be found in a matter of seconds on the internet. It could be argued that this is making people lazier. There is a distinct lack of a need to think hard about areas such as spelling, with the introduction of the internet in the classroom. This has caused a worry amongst scientist who believe it to be significant.

4.2 Lesson preparation

The introduction of technology in the classroom has dramatically impacted teaching in the last twenty years. However, it could be argued that it has made lesson preparation easier for teachers. There are programmes and applications available that offer lesson plan templates to teachers. This means that all their work is easily accessible, and all stored in one place which makes things simpler for people with busy timetables. However, what must be kept in mind is that technology should enhance educational experience and should not replace teaching altogether.

4.3 Assessment

Technology use has impacted the way that students are assessed. Technology means that schools are able to create online criteria which is flexible and can be altered to suit the needs of individuals. This means that criteria can be more specific and can be designed to support individuals, rather than a whole class/ school basis. The use of technology for assessment can also help teacher keep track of their class' progress as a whole. In the case of bigger classes, teachers can easily notice if any

students are struggling and help them accordingly. This efficiency should result in whole school improvement.

4.4 Making a change

The use of technology in the classroom has broken down boundaries in various ways. One of these ways is that learning does not have to end when the school bell goes at the end of the day. Teachers are able to continue the education when their students are at home. Most schools have now got some form of online platform through which they can set homework tasks. This encourages a holistic learning experience in all aspects of life. Learning is not confined to the traditional classroom and can take place anywhere, thanks to technology. Although extremely rare in this age, some young people might not have access to the internet at home. The expectation that all students have internet access could result in the education of these young people being jeopardised.

4.5 Collaborative learning

Technology in the classroom enables students to play a more inclusive role in their education. There are platforms that allow students to interact with one another, or their teachers, during lessons. While technology such as laptops and tablets have a more important role out of the classroom, there is also an important role for it within the classroom too. This allows more flexibility, with technology acting as a key component in collaborative learning.

4.6 Teacher influence

It could be argued that teachers benefit from the inclusion of technology as much as the students. Those with busy schedules can have their lives made easier by using software to simplify things.

O'Brien (2018) suggests that technology is most effective in the classroom when teachers are utilizing it. He proposed that it is more effective in the hands of teachers than it is pupils. O'Brien reported that "in some countries, adding one teacher computer per classroom had more than 10 times the impact on improving educational performance of adding a student computer to that same classroom".

O'Brien's report also suggests examines different teaching approaches and found that students who were receiving a combination of inquiry-based and a more

traditionalist style of learning (with a strong teacher guidance) had the best outcomes.

Chapter 5 – Findings and conclusion

After extensively studying the arguments for and against the use of technology in the classroom, I feel that a fair judgement can be made. There are fair points made for both sides of the argument. On one hand, it could be argued that we should embrace new technology with open arms and harness it to enhance educational experience. As Alan November (2012) concludes, teachers should accept that learning has changed, and children today are born into a world where they have never been without technology. His "digital learning farm" model offers encouragement for teachers to let children take control of their education. November has the right idea in that there is no point trying to fight the technological revolution we are living in. Instead, we should embrace it, adapt, and overcome any fears. Even the fact that there is an Information Technology section in the National Curriculum (2013) demonstrates how much the educational experiences of young people have changed in the last twenty years. However, it is important to remember that while education has changed, there is still a place for traditionalism in the classroom. Although the structure of lessons might have changed, the core teachings remain much the same.

Prensky's (2001) prediction that "legacy" subjects such as Maths, English and Science would become outdated has not come to fruition. Instead, there has been a collaboration of traditionalism and "future subjects" (Prensky, 2001) to create today's education system. Future subjects include Information Technology, robotics, and software development. While it could be argued that these play a valuable role in today's society (with the inclusion of technology in many job roles), the key subjects bare more value. Prensky's initial wariness towards technology in the classroom reflects the thinking of the time but things have changed significantly since then. Collins and Halverson (2018) suggest that there is a mismatch of programs that schools offer and skills that children need to be successful in life. However, even Prensky himself has moved away from this notion and although his argument still remains present in today's society, it is a reflection of the world we are living in. It is a time for change and to embrace the unknown. To continue this, we must accept change and learn to live in an age where technology is rife but also remember our roots in traditional education.

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In conclusion, the educational experience of the younger generation has changed drastically in the last twenty years. This is largely to do with the use of technology. It must be remembered that the world is constantly changing, especially regarding technology. Therefore, it would be wrong for schools not to endorse technology. This is because they would be left behind in a fast moving and everchanging world, and it would not be fair on those young people. While it is still a strange concept to some, people in the older generation should accept that times have changed since they were in education. The contrast between the theories of Alan November and Marc Prenksy highlight the contrast in attitudes towards technology in education and act as a way to view how ideas have changed throughout the years. To anyone that wishes to research into this area, the works of November and Prensky are important to consider. The views are very different but both bare weight and value for their designated argument. Reading these works are essential to gain information and insight on this subject.

One day this might well be the case for the current younger generation. In a further twenty years, they may feel the same way if technology advances in even further. In essence the lessons to be learned here are about acceptance and adaptation.

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