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WHAT IMPACT DOES THE USE OF DIGITAL READING HAVE ON THE READING ATTAINMENT OF A P6 CLASS?

BY

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A dissertation submitted in part requirement for the degree of

MEd Professional Practice

August 2022

Dissertation Word Count: 16,556

**Abstract**

This research study was influenced by an area, within the researcher’s primary 6 class, that she found problematic and wanted to investigate. The learners within the researcher’s class were not attaining in reading and did not engage with reading lessons. The research explored the use of digital reading in a primary 6 classroom and the impact it had on the attainment in reading of P6 learners. The data collections were analysed and justified using a mixed methods (MM) approach to professional enquiry. Questionnaires, focus groups (FG) and assessment data were the methods used and thoroughly analysed for this research study. Findings expose the need to develop digital learning within the classroom to increase engagement and subsequently attainment in reading. Due to limited literature and research, further studies in this field would be of value.

**Acknowledgments**

I would firstly like to thank my supervisor, Mary Clare Kelly, for her constant support and guidance throughout this learning process.

I would also like to thank the school in which the research was conducted, my Head Teacher and my colleagues for their continued support and patience throughout this year.

I would also like to thank the parents and pupils who participated in this research study.

Finally, I would like to thank my friends and family for their ‘you can do it’ messages of encouragement and for always supporting me.

**Permission to Consult**

The author gives permission for this dissertation to be made available by the University of Glasgow to anyone who knows of its existence and wishes to consult it.

**List of Abbreviations**

AR- Action Research

ASN (Additional Support Needs)

CfE- Curriculum for Excellence

CLPL- Career Long Professional Learning

DN- Digital Natives

DT- Digital Technology

ERIC- Education Resources Information Centre

FG- Focus Group

GDPR- General Data Protection Regulation

IPRA- Improving Performance to Raise Attainment

ITE- Initial Teacher Education

MM- Mixed Methods

RQ- Research Question

SAC- South Ayrshire Council

SD- Standard Deviation

SIP- School Improvement Plan

SLT- Senior Leadership Team

SNSA- Scottish National Standardised Assessment

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**Chapter 1: Introduction**

**1.1 Purpose/Background**

This dissertation aims to investigate the impact that the use of digital reading has on reading attainment in a P6 class. Digital learning has been outlined as a priority by the Scottish Government in Education Scotland’s national improvement framework (2016) in order to ‘enrich learning and teaching, help to raise levels of attainment and close the poverty related attainment gap’ (Scottish Government, 2016, p.4). The poverty related attainment gap affects children and young people living in the most deprived communities who do not attain as well as children and young people from other areas of the community. In 2015, the Scottish Government identified the problem and created measures to monitor the gap, as well as initiatives to close the gap, including the ‘skilful deployment’ (p.4) of digital technologies in schools. The researcher is aware, within her classroom, of the poverty related attainment gap and believes this research study investigates the impact digital technologies has on the attainment of all learners within her class. All learners and educators should be able to ‘benefit from digital technology (DT) in the classroom’ (p.58) and these benefits will be invaluable to learners in the future. Primary school educators are in the best position to ensure learners benefit from using DT in their learning. The First Minister and cabinet secretary for education and skills state; ‘digital technology in our schools will also ensure our learners develop a level of general and specialist digital skills that are so vital for learning, life and work in an increasingly digitised world (Scottish Government, 2016 p.4). In response to this, the researcher believes implementing digital technologies within classroom lessons fit this directive perfectly. As previously stated, educators are in the best position to put these priorities into action and in turn increase attainment, leading learners to positive destinations (Scottish Government 2020).

Digital technology is not the only priority of the Scottish Government. Raising reading attainment is also a key priority of the Scottish Government, as seen in its National Improvement Framework and Improvement Plan (2019). In response to this, it has become a priority within the school where the study has taken place and raising attainment in reading is a vital goal within the research study class. Studies show that reading has the ‘greatest impact on a child’s educational success’ (OECD, 2002). Not only do studies show that reading has a significant link with educational achievements, studies also found that raising reading attainment in a primary learner can impact happiness and success in adult life (Clark and Rumbold, 2006). Therefore, it is crucial to ensure primary school learners experience optimal reading instruction and teaching practices to enhance their motivation, engagement and subsequently their attainment in reading. Many reading programmes have been created by the Scottish Government to help raise attainment in reading across all schools in Scotland. They include; First Minister’s Reading Challenge, Book Bug, Reading schools. All programmes were created to help build a reading culture in schools in Scotland and to work with young people age 5-18 to ‘discover the power of reading’ (Scottish Government, 2020). As the researcher is the literacy lead, within the research school, she has identified a problem within reading and aims to investigate it through the priorities set out by the Scottish Government and the School Improvement Plan (SIP). The research study aim is to investigate if digital reading has an impact on raising reading attainment.

A lot of literature has been reviewed based on the research study focus. The outcome of the majority of this literature shows a positive impact that digital reading has on reading assessment scores. However, the majority of the research reviewed (discussed in chapter 2; Literature Review) are studies published with participants in higher education. A vast majority of the studies were undertaken outside of Scotland. This draws attention to the lack of research conducted by classroom teachers educating in classrooms in Scotland and it also emphasises the need for this practitioner research focus.

**1.2 Rational**

In response to the Scottish Government’s focus on promoting digital learning, there has been a strong emphasis placed on strategies to enhance digital reading in the classroom in the researcher’s school. Research proves that reading, of all kinds, has positive impacts on learners’ attainment across the curriculum, health and wellbeing, critical thinking, creativity, empathy and resilience (Lee et al., 2021; Mar et al., 2006; 2009; McGeown et al., 2020). In response to this, South Ayrshire Council (SAC), where the research took place, has placed a huge emphasis on ensuring all kinds of reading are explored within the classroom and all schools foster these impacts.

Following this priority set out by SAC, the school, where the research has been conducted, has highlighted the development of digital reading as a main priority in the SIP with the introduction of the intervention myON which will be discussed later in this section.

The COVID-19 pandemic has changed many things in the lives of children and young people, including the way they work and learn. It is the responsibility of all educators to ensure they are adapting their learning and teaching to be responsive to the full range of learners’ needs (Education Scotland, 2021). As a consequence of this, the need for children and young people to be able to develop digital skills and abilities has come to the forefront.

In summary, based on the importance of reading and digital learning areas, along with the world that children are currently learning in today, the need for a practitioner-based research study, to investigate how to develop and support the use of digital learning within reading in the researcher’s P6 class was essential. This was essential in the researcher’s class because the learners in the class have limited access to DT and therefore have never used DT for reading lessons. The children have only ever accessed print texts for reading lessons and were disengaged. Almost all learners reading age was below their actual age in reading assessment scores at the beginning of P6. Baumfield et al. discuss that research can be invaluable if it is ‘closely related’ (2008, p.14) to the educator’s practice and experiences within the classroom hence the main reason for this research study focus.

**1.3 School Context**

The study took place between April and June 2022 in a Primary 6 class with children aged between 10 and 11 years old. The study was conducted in a primary school in an area within the Scottish Index of Multiple Deprivation (SIMD) 1 and 2 in South West Scotland (Scottish Government 2020) with a roll of 296. The SIMD is a scale used to measure deprivation across 6976 communities (data zones). If a child lives within SIMD 1 or 2, they are identified as living in an area of deprivation. This can mean that the child has access to fewer resources or opportunities (Scottish Government, 2020). The school is Roman Catholic meaning pupils attend from all over the catchment area covering the least and most deprived areas in the region. The research was initiated by the author’s experience as a teacher of a mixed ability primary six class, of 17 learners (9 girls and 8 boys) who are of mixed ability and socio-economic status. who were disengaged with reading.

**1.4 Dissertation Outline**

This dissertation is divided into 5 chapters.

* Chapter 1 highlights why this research study focus was chosen.
* Chapter 2 provides a detailed literature review based on the research study focus.
* Chapter 3 will explore the research methodology and the role of an action, MM research approach. Chapter 3 will also include data collection methods and how these have been analysed. There will also be a section, in this chapter, on ethics and limitations of the proposed intervention.
* Chapter 4 examines the findings and an analysis of the research.
* Based on the above, chapter 5 will focus on conclusions and recommendations.

**1.5 Specific Aims and Objectives**

In order to fully assess the impact of the use of digital reading in the classroom, the aims of the proposed study are as follows;

* To assess the impact, if any, of the implementation of digital reading on reading assessment scores
* To find out any benefits or drawbacks in using DT in reading lessons
* To actively engage with the pupils and gather their views and opinions on the effectiveness of the intervention.

Existing research suggests the use of digital texts can have a positive impact on learners’ literacy skills (Barajas-Murphy, 2017; Singer and Alexander, 2017; Julian, 2019). Therefore, these aims hope to validate these claims and enable the researcher to draw conclusions and make recommendations for future classroom practice within reading lessons. Overall, this will allow improved learning and teaching for the benefits of all learners in the classroom.

In order to achieve these aims, pre- and post- intervention reading assessments were administered to all participants, along with pre- and post- intervention questionnaires to gauge learners’ views on reading and to actively engage with learners. FG were also conducted pre- and post- intervention to fully grasp learners’ opinions on the effectiveness of the intervention.

**1.6 Research Question**

This research study aims to answer the question:

What impact does the use of digital reading have on the reading attainment of a P6 class?

The research question (RQ) has been split into 3 sub questions to help guide the research study and ensure a robust analysis of the original RQ. They are as follows:

* What is digital reading?
* What are the perceived benefits or drawbacks of using DT in reading lessons?
* To what extent, if any, does digital reading enhance reading attainment?

**1.7 Why this research study?**

**1.7.1 Reading**

‘Reading well, and with enjoyment, is a skill that unlocks invaluable opportunities at school and in life.’

(Save the children, 2014)

Reading well, defined by a variety of research, is the ability to, by the age of 11, have a wider understanding of the meaning behind stories and information (Clark, 2014; Gross, 2008; Scottish book trust, 2016). Children should be able to read a range of different materials, including magazines, newspapers and online texts (Scottish Government, 2014; National Literacy Trust, 2018). Reading, and more specifically, reading well, remains a Scottish Government priority. Not only is it a Scottish Government priority but the responsibility of all teachers to ensure every child has an opportunity to succeed in reading (GTCS, 2012). The researcher has found within her practice that in order to be able to ‘read well’ there has to be some sort of enjoyment or engagement with reading. The learners in the researcher’s class do not engage or enjoy reading lessons and therefore are not reading ‘well’. Being able to read well is associated with good wider language skills and subsequently better literacy skills overall (Scottish Book Trust, 2016). The researcher has found that learners need to be able to have reading skills to achieve in all areas of the curriculum allowing learners to succeed in areas that interest them, this is also shown in studies that state there is also an increasing importance of literacy skills within the workforce (Education Scotland, 2019). If learners are unable to read, they will be unable to develop skills in areas of interest or areas of future career options. In essence, reading is a fundamental skill that all children need to have to succeed in future destinations (Scottish Government, 2008) and it is the researcher’s duty to ensure learners are experiencing a wide range of texts in order to develop reading skills.

**1.7.2 Digital Learning**

Whilst there is no universally accepted definition of digital learning, many scholars believe it to be an opportunity to facilitate, enable and enhance learning using electronic technology (Lin et al., 2017; Sousa, 2019; Warschauer, 2017). As outlined in the digital learning and teaching strategy for Scotland framework (2021), digital learning involves a range of learning experiences that enhance knowledge and skill all whilst considering the needs of learners and their families (Education Scotland, 2021). Educators should ensure that all four of the following essential objectives, central to successful digital learning, teaching and assessment and set out in The National Improvement Framework (2014), are achieved:

* Develop the skills and confidence of educators in the appropriate and effective use of DT to support learning and teaching.
* Improve access to DT for all learners.
* Ensure that DT is a central consideration in all areas of curriculum and assessment delivery.
* Empower leaders of change to drive innovation and investment in DT for learning and teaching.

However, despite the pervasive nature of DT, ‘its benefits are not always fully felt within our education establishments’ (Scottish Government, 2016, p.3). In order to overcome this, Education Scotland advocates the importance of ensuring digital learning is ‘embedded’ (p.3) within all areas of the curriculum. Furthermore, the Scottish Government (2020) has placed an increased emphasis on “improving educational outcomes” (p.5) through the use of DT. In response to this, the researcher will investigate the implementation of DT within reading lessons and the impact on the attainment of learners in her class. As technology advances, and the world is becoming digitalised, it is the researcher’s duty to enhance learning and ensure children are able to use and access digital texts to develop literacy skills.

**1.7.3 Intervention- myON®**

As the researcher is the literacy lead in the research school, she spent, along with the school literacy working party, a lot of time exploring several reading intervention programs to ensure the best suit for the school and its improvement priorities as outlined in the introduction to this chapter. The intervention chosen is an online reading program called myON®. This intervention provides a large digital library from which learners can choose different texts based on ability and interests. The digital reading materials vary throughout the online library. Students can choose between books, magazines, comics and other types of documents to read. The majority of the books in the myON® library have pre-recorded audio tracks that students can listen to as they read the book, paired with dynamic highlighting so that students can follow along. Learners’ basic comprehension skills can be monitored through digital reading quizzes. These quizzes then allow the educator to set targets and benchmark assessments to monitor reading attainment. This integrated digital reading program can adapt to each student’s profile to increase reading growth and motivate students to read. An online assessment system which utilises reading assessment benchmarks are employed to ensure that students are targeted with reading materials at an appropriate level that provide challenge, but not frustration (Sandford-Moore, 2013).

Research based on the use of myON® is scarce and small scale and therefore suggests further research is required. The following chapter provides a detailed literature review of the research study focus.

**Chapter 2: Literature Review**

There is a vast amount of research based on digital reading and, although the majority of research highlights that digital reading has a positive impact on learners, a lot of the research focuses on learners with additional support needs (ASN), secondary school learners and predominantly university students (Barajas-Murphy, 2017; Julian, 2019; Korby, 2018). The literature in this section will highlight the key features suitable to this research study and will be discussed in order to ensure an unambiguous focus of research study. The literature review seeks to examine research around digital reading in primary schools, however some research studies that took place in both secondary schools will be reviewed to explore findings from different establishments as the research based solely on primary education is limited. Similar themes found throughout the literature will be reviewed as a starting point.

In order to fully examine these themes and answer the aforementioned RQ (section 1.6 page 13), this literature review aims to explore important research concerning reading in the curriculum, digital reading interventions and strategies and the impact these have on attainment in reading. The aim of this review is to retrieve the available literature to answer a specific RQ and identify ‘what works’ (Boudah, 2011).

**2.2 Search Strategy**

To ensure a thorough search of scholarship, a search of the ERIC (Education Resources Information Centre) online journal database (Table 1) was conducted. To ensure depth of research, Summon, The University of Glasgow’s online database of articles was also used. This ensured a rigorous and unbiased approach for locating and reviewing relevant literature. Many scholars note that using systematic search methods across multiple databases produces more accurate and robust findings (Anderson et al., 2004; Booth, 2016; Paez, 2017). However, this point is argued by the Organisation for Economic Co-operation and Development (OECD) (2007) who maintain that because there is a lot of research to be found, it may lose its credibility and may not be vetted by the educational research community. Paez (2017) refers to this as ‘grey literature’. Mahood et al., (2014) agree with the aforementioned authors and note that using ‘grey literature’ (Paez, 2017) can often broaden searches and provide a fuller view of available research which can help to minimise the urge of some researchers to only cite findings with positive outcomes. The researcher found this to be true and was able to find both positive and negative outcomes from different researchers involving digital reading and how it impacts learners’ engagement and attainment. Exploring various viewpoints helped ensure an unbiased approach when critiquing the research found.

A Boolean approach was also used when searching each database. Taber’s (2013) strategy was used to find relevant literature in a variety of contexts by changing search phrases. This was beneficial as the majority of research generated was not relevant to the aim of the research study. Search phrases were changed from ‘digital reading intervention’ to ‘digital reading attainment’ and finally ‘digital reading engagement’. Many of the studies found using the systematic search strategy were duplicates, however, after excluding irrelevant studies, a narrower search was conducted and research that was relevant to the aim, context or target audience of the research study was established. Another search strategy was then conducted in order to find relevant literature based on reading within the Scottish curriculum. This search strategy followed the same systematic method ensuring all relevant literature was examined. To do this, many filters were used and exclusion criteria was based on:

* Studies based in university setting
* Studies based in special schools for learners with additional support needs
* Studies relating to other curricular areas
* Studies relating to reading strategies that do not use digital technologies

This is detailed below in Table 1 and 2.

‘Primary education’ filters were also added to searches to, again, narrow findings, although some studies from secondary schools were used in this research study to ensure use of ‘grey literature’ as Paez (2017) discussed. Furthermore, many studies follow English and International curriculum, as well as Scotland’s Curriculum for Excellence (CfE) and all relevant research has been included in this literature review.

Another useful approach from Taber (2013; 161-162) is the ‘paper chase’ method. This allowed the researcher to follow the references of other work cited on scholarship to find research most relevant to the research study focus that may not have appeared on databases. In keeping with the ‘digital’ theme of this dissertation, a digital paper chase was undertaken which allowed the researcher to download scholarship rapidly and search efficiently for key words or themes, saving valuable time.

As a starting point, the researcher searched for literature with a digital reading focus. The results from that search strategy are outlined below.

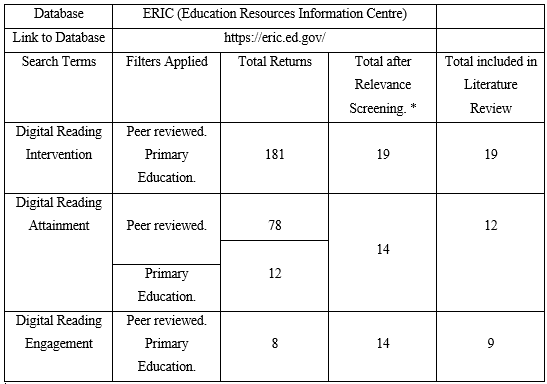


Table 1: Systematic Search Strategy of Literature.  
\*Excluding duplicates or literature that is a different context, aim or target audience

Another search strategy was conducted focusing on reading within the curriculum not including any digital search terms. This is outlined below.

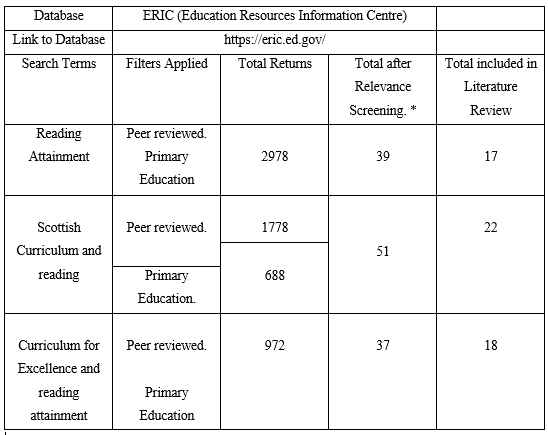


Table 2: Systematic Search Strategy of Literature.  
\*Excluding duplicates or literature that is a different context, aim or target audience

The scholarship available on digital learning is diverse, extensive and changing all the time. However, digital reading in primary education is researched to a lesser degree; especially in Scotland. Although relevant research was scarce, similar themes were found throughout a variety of literature. This chapter aims to explore the following themes fully:

* Defining digital reading
* Digital reading strategies in the classroom
* Digital reading and attainment
* Key benefits and barriers

**2.3 Defining Digital Reading**

Learners are doing more reading on digital devices than they ever have before (Limniou, 2021). Digital technologies can be used in every curricular area and homework is now predominantly administered on computers or other digital devices adding to the incentive for teachers and educators to teach digital reading strategies, but what is digital reading?

Digital reading is defined as the process of extracting information from a text that is on a digital learning device (Nordquist, 2017). The reading process may be mediated by using laptops, tablets, mobile phones, computers or reading applications such as; iBook on an iPad. Buccellati (2008) adds to this that digital reading is usually the reading of multimodal digital texts combined with images, videos and other media elements including e-books, articles and websites. Digital technologies and devices change the way learners read dependant on the device or text (Buccellati, 2008). Kerr (2019) discusses digital reading and mentions the use of ‘images, tools and electronic aids’, that readers would not have on print text, being the fundamental difference between digital reading and print reading.

Many international learning groups define digital reading strategies as the ability to think critically and make balanced judgements about any information readers find and use (ACRL, 2016; CILIP, 2018; Nordquist, 2017). Digital reading is required in learning and teaching to enable learners to perceive main ideas from different texts, use relevant information from online resources and gives learners the basic and critical information skills needed to support them in understanding the information they have read.

Furthermore, almost two decades ago, Frechette (2002) predicted that DT “… will alter our very conception of basic terms such as reading, writing, and text.” (p. 3). The trend that technological advancements have changed the way people read, write, attain, act on, use, evaluate, and produce information and the manner how people interact, communicate and engage in society (Coiro, Knobel, Lankshear, & Leu, 2008; Warschauer & Matuchniak, 2010) seems to agree with this prediction.

Different digital reading strategies must be taught in order for learners to develop deeper understanding of texts (Hahnel et al., 2015). Whilst reading typical print books in a classroom is mostly a linear process, where the teacher or learner will follow the pages from start to finish, digital reading can be taught both linear and non-linear. Students, therefore, have the option to navigate through the digital texts and decide their own reading pathway. Studies show that students prefer being in charge of their own reading and being able to self-navigate texts easily (Turner and Hicks, 2015).

The knowledge, skills, and awareness needed for digital reading are aligned to the concepts in the CfE literacy framework (Scottish Government, 2016). The framework provides, for learners, a range of learning opportunities which will contribute to the development of reading including critical thinking, creativity, and knowledge and appreciation of literature and culture. As outlined in the framework, reading and responding to literature and other texts play a central role in the development of learners’ knowledge and understanding. A variety of research discusses the importance of the use of tools within digital reading (Cheek, 2014; Ortlieb, 2014). They state that the tools are used to locate, edit and manipulate resources which allows learners to evaluate and interpret the digital texts. Hill and Hannafin (2010) share this view and note that the use of digital tools establishes a ‘resource-based learning theory’ allowing learners to locate resources or texts within interventions, analyse and evaluate the meaning of texts while building on the essential skills outlined in The National Framework for Scotland on digital literacy. The framework also prioritises ‘digital communication’ and ‘texts presented electronically’ (Scottish Government, 2016, p. p4) which reflects the increased use of multimodal communications encountered by children and young people and emphasises the need for this research project.

Digital learning provides an opportunity for students and teachers to remain connected and engaged whilst setting individual targets based on ability of learners (Ray, 2020; UK Government, 2020). Studies have shown that, in 2020, nearly a quarter of the British population were learning using online materials as part of a higher education program and 85% of learners believe that using DT to learn has enhanced their classroom experience (Clark, 2021).

Having defined what is meant by digital reading, it is now important to critically discuss digital reading in the classroom.

**2.4 Digital Reading in the classroom**

Even before the COVID-19 pandemic, using digital devices within the classroom was a huge priority in Scotland (Scottish Government, 2016) under the assumption that computers, laptops and other devices will help learners to improve both engagement and attainment. A huge amount of literature discusses the use of digital devices in the classroom, with mixed views from researchers. Equally, there is varying literature focusing more specifically on the use of digital reading in the classroom. Although the Scottish Government has emphasised the importance of making classrooms digital, and a number of scholars back the governments plans to ensure learners have access to digital devices in education (William, 2019), there are also strong concerns found in research about the massive consumption of digital reading in educational classroom settings. There is a wealth of recent research that discusses the challenges in the transition from paper to digital (Clinton, 2019; Delgado et al., 2018; Furenes et al., 2021; Kong et  al., 2018).

A vast amount of research has shown that when learners in a classroom read using digital devices they tend to ‘scan’ more than read in depth (Delgado et al., 2018). There are many research studies that show learners have low engagement levels when reading on a digital device and learners can become more distracted (Kong et al., 2018). Supporting this view, evidence from Annisette & Lafreniere (2017) has shown that learners spend less time reading on digital devices than those who read print texts leading to underachievement in reading comprehension skills.

On the other hand, although a lot of research indicates that reading printed texts has academic advantages, there are many scholars who insist on digital reading in the classroom to improve comprehension skills (Judge et al., 2006; OECD, 2021). These scholars all discuss how digital devices can improve collaboration between learners and their peers and learners and their teacher. Another similar theme found in the different literature is engagement in lessons. Technology can encourage active participation and learners have the ability to incorporate different learning styles. Paulson (2006) indicates that digital reading can encourage learners to lead their learning and highlights the importance of self-selected reading. Johnson and Blair (2003) support this view and found that learners who have the option to choose their reading material based on their own interests will inevitably read more and read for enjoyment, increasing engagement and subsequently attainment. However, several other scholars worry that self-selected reading will allow learners to choose books that are not within their reading level and may read books that are not challenging enough or may read the same book over and over again (Fleming, 2006). Amongst the literature reviewed the researcher did not find enough data or research to prove either side of the argument. However, within the aforementioned reading intervention, myON®, chosen for this research study , learners had the ability to select their own reading materials and also completed regular quizzes set by the built-in reading framework that ensures all learners are reading at their achievement level. Studies show that learners who read at their reading level are more motivated to read (Daggett, 2003).

Having discussed the use of digital devices for reading lessons in the classroom, it is now important to critically discuss the link between digital reading and attainment.

**2.5 Digital Reading and attainment**

Learners from high-income homes do significantly ‘better’ at school in Scotland than those from low-income households (Scottish Government, 2016). The poverty related attainment gap, as mentioned in the introduction in chapter 1, can start from as early as 5 years old where learners from a high-income household are achieving between 10-13 months ahead of learners from a low-income household (Scottish Government, 2016). By secondary school more than twice as many learners, in Scotland, who live in the least deprived areas ‘perform well in literacy’ as those learners from the most deprived areas (Scottish Government, 2016).

There are many ‘actions’ set out by the Scottish Government policy group, improving Performance to Raise Attainment (IPRA) that provide clear guidance about how to use the policy to close the attainment gap (Scottish Government, 2015). One of the main actions is to highlight projects and develop robust and cost-effective teaching approaches that successfully close the gap. However, it should be noted that there have been major limitations in identifying which approaches have the greatest impact, due to the lack of evidence (Sosu, 2014). It is important to identify ways in which learners are learning and to explore how teaching practices can be adapted to suit learners to help decrease the gap.

Learners in classrooms today are digital natives (DN) which is a term coined by Prensky (2012) that describes learners born into a digital culture who can make more natural use of digital devices. The term describes learners today who have inherited skills for electronic or digital technologies that are used in every day settings (Prensky, 2012). Literature shows that DN are more likely to face significant frustrations within literacy than those in the past (Prensky, 2012). In support of this, studies by Wardrip, 2014) and Schwarz, 2016) have shown that learners are reading from computers, phones, tablets or other digital devices more quickly and ‘aggressively’ than before and that educators should adapt their practice to capture how students learn to avoid frustration. Prensky (2012) supports this view and has discussed how DN today become discouraged with educators who do not incorporate digital devices into their practice. The class of learners in which the research was conducted would all be described as DN and have all previously demonstrated digital literacy skills therefore it is important for the researcher to adapt her teaching practice to suit the needs of the learners in her class.

There was a plethora of international research found that shows the links between digital reading and increased attainment. The Scottish Government has also identified the link and within the ‘How Good Is Our School’ (HGIOS) Framework of highly-effective practice within the classroom. In all examples the importance of digital learning and teaching was highlighted (Scottish Government, 2014).

As with any teaching approach, as well as positives, there can also be drawbacks or differences of opinion within the literature. It is important to critically explore both views. The key benefits and drawbacks of using digital reading in the class, will be discussed in the next section.

**2.6 Key benefits and drawbacks**

There is a variety of literature on digital reading and its benefits and drawbacks. Many researchers note the huge importance on digital reading in this modern world, however there are also a great deal of drawbacks mentioned throughout the literature. This section aims to thoroughly review the different viewpoints from a variety of literature.

A positive theme found throughout the research showed that digital reading can transform reading from a solo learning experience into a social learning experience (Paul, 2014). A lot of researchers discuss how interactions, working collaboratively and social discussions are a few of the many benefits of digital reading (Paul, 2014; Sangani, 2009). Strommen (2014) adds that learners can participate in the engagement and discussion of the reading content and tasks at their own pace and are able to communicate digitally allowing the social collaborations to continue. This viewpoint, that online reading communities build positive social behaviours, is echoed by Loh and Sun (2019) who state that students who enjoy similar texts and authors have a community of fellow readers and reading resources to motivate and support their reading, regardless of their social class. However, some research has shown that using digital reading in a primary classroom setting can have a negative impact on children’s social skills and interactions with each other (Donald 2016; Maykel, 2017). They suggest that children are more inclined to read alone, when using a digital device, and interactions with peers are of lesser value. On the other hand, as mentioned previously, there is a growing amount of literature on the positive impact digital reading strategies have on social opportunities for learners. Some research agrees that children are able to work more collaboratively and have more opportunities to work together on one piece of literacy with the use of digital tools (Lim and Toh, 2020).

Digital tools are used on majority of digital reading platforms including the aforementioned intervention, myON®. These tools can be accessed by learners to annotate text, increase font size, bookmark specific pages, highlight text or information and find definitions of unfamiliar words (Sandford-Moore, 2013). These strategies for digital reading allow learners to ‘do more’ with a text than if the text was in print (Hess, 2017). Studies show that learners can quickly and efficiently find a deeper understanding of a text by using the digital tools (Dobler, 2015; Daniel et al., 2013). However, many other scholars suggest that digital reading and digital tools can instil bad habits in learners making it more difficult to engage deeply with a digital text (Cho, 2010; Dalton, 2008). The author of this study found truth in both these arguments when conducting this study. Learners who were unable to utilise a dictionary to find definitions of unfamiliar words would spend time looking through a dictionary, where as now they had a digital dictionary that would search and define the word for them in seconds. This was beneficial to a lot of learners as it sped up their understanding allowing them to quickly continue reading the text with understanding. However, some more advanced readers would become distracted with the use of the tools and would spend more time scanning and navigating around the text instead of reading deeply and understanding.

Other studies support the idea that digital reading can become more distracting than if learners were reading a print text (Dail, 2005) and the non-linear nature of an online screen showed participants would use skimming and scanning techniques to read and this would cause eye discomfort (Johnson, 2013). To a higher extent, studies also found that participants would read only about 20% of the online text and readers would attempt to minimise the number of words they read online (Nielsen, 2008). On the other hand, there are some studies who disagree with this and have found that participants not only need to use print text reading strategies, but they need to use these strategies in a more complex way, developing a more mature reading ethic (Cho, 2010). This was supported in a study by Schmar-Dobler (2003) who found that learners reading online texts employed 7 different reading strategies consistently throughout the study: prior knowledge, monitoring comprehension, repairing comprehension, determining ideas from the text, inference, synthesizing and asking questions. The combination of print text skills and digital reading skills are necessary because readers are required to have the ability to construct and examine meaning within a text as well as search and locate information quickly and efficiently (Cho, 2014; Dail, 2005).

One of the most common negative themes found in the literature is that using digital devices can be distracting. Researchers have found that learners are more commonly found off task than on task when using digital devices in learning (Sana & Weston, 2013). Studies suggest that learners using a laptop in class are more likely to multi task and be more distracted (Wurst, Smarkola & Gaffney, 2008). On the other hand, studies have shown that using digital devices in classrooms can increase satisfaction, motivation and engagement amongst learners (Fried, 2008; Hyden, 2005). Although these studies show the benefits of using laptops in classrooms, they also discuss the importance of ensuring digital devices are used correctly (Fried, 2008) and are maintained to a high standard, including charging, servicing and monitoring learners’ work (Hyde, 2005). It is vital, if introducing devices into a classroom for learners to use, that there should be no setbacks for learners when accessing the devices (Sanna, 2013) as this can have a negative impact on learners’ work.

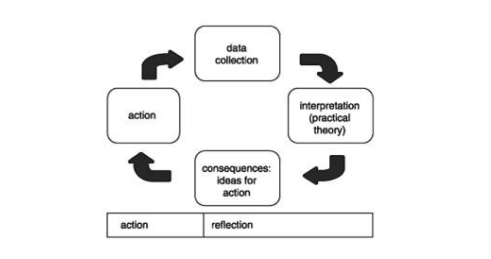
The literature reviewed in this chapter guided the author in decision making throughout the methodology of her research study. This will be discussed in more detail in the next chapter.

**Chapter 3. Methodology**

The aim of this research study was to investigate if the implementation of digital reading lessons in a primary six classroom had an impact on reading attainment. Following on from chapter 2, where conclusions were drawn from the literature reviewed, this chapter details the design of the practitioner research study along with the research methodology used in the Action Research (AR) study using a MM approach. This section will also include data collection methods and how these have been analysed to answer the RQ ‘What impact does digital reading have on the reading attainment of a P6 class?’ Ethical considerations and limitations of the research will also be discussed. The literature found in this section was located using a systematic search strategy, similar to the strategy used in the literature review of this research. A database search was conducted of mixed method approaches to professional enquiry and this can be found in Appendix A. By following a systematic search strategy, ethical issues surrounding data collection, limitations and dissemination were raised.

**Action Research**

This research study was based on an AR model which allowed a method of systematic research and followed a cyclical process enabling the researcher to improve and reform her current practice (Hopkins, 2008). The model, shown in figure 1 below (Altrichter et al. 2007), demonstrates the AR cycle. Within this model, the researcher gathered evidence, reflected on evidence and related it to her practice. A key part of the AR process is to gain an ‘inside knowledge’ about the participants (Greenwood and Levin, 1998, p.50) allowing the researcher the opportunity to be the driving force in ‘shaping and leading’ educational change (Donaldson, 2011, p.4). The AR model highlights the importance of the researcher’s reflections and how the process of this research study informs her actions.



**Figure 1:** The Action Research Cycle (Altrichter et al., 2007).

AR has been defined by many authors as the understanding of a practice by a practitioner and the improvements of the problem or issue in which the practice takes place (Carr and Kemmis, 1986; McTaggart, 1998). In addition, AR models are designed to fit a short and quick timeframe so the results can be used to improve immediate practice (Mertler and Charles, 2008). The researcher recognised a problem within her current practice which merited further research and as a reflective practitioner she was able to develop her practice in order to improve the teaching and learning experiences for all learners in her class quickly and effectively.

While AR suited this type of research study, as it had direct impact on the teaching and learning of reading in the classroom, there are some criticisms of using the model. Pine (2009) believes that using qualitative data can lead to biased interpretations of the data, especially when the researcher works so closely with the participants. Some scholars question the reliability of the data when it is being interpreted by the class teacher and therefore researchers can create their own sense of reality (Hopkins, 2009).

Despite this, AR is particularly suited to small scale studies within a classroom context (Cohen et al., 2013) and therefore the researcher chose to follow an AR approach. This allowed her to be ‘responsive and flexible’ (Cohen et al., 2013) and enabled an ‘authentic’ research study which could be shared with other practitioners and used to enhance their own learning.

**3.2 Research Paradigm**

The term ‘research paradigm’ was first used in 1962 by Thomas Kuhn who described a philosophical way of thinking. Lather (1986) explains, a research paradigm reflects how the researcher wants to live. It shows the way in which researchers see the world and how researchers will examine the methodological areas of their research study and how they analyse those methods (Guba, 1994). The paradigm defines how every decision made by the researcher in a study has implications of how the data will be constructed and analysed. Therefore, it is important that, when writing a research study, the researcher clearly states the paradigm in which their study is located.

There are two main paradigms used as umbrella terms within research studies, positivism and interpretivism. The purpose of positivism is to observe social reality and participants views are not considered (Cohen et al., 2013). The interpretivist paradigm opposes research studies that are objective and de-humanised (Denscombe, 2017). It is a reflective, contextual approach which focuses on human knowledge (Yanow and Schwartz-Shea, 2014). Many interpretivist researchers believe that data cannot be collected without context or participant knowledge (Denzin, 2011). Despite there being a wealth of interpretive research studies, the interpretivism paradigm has its critics. Some scholars believe that interpretivism can be bias on behalf of the researcher (Yanow, 2009). The reliability of the findings can be undermined to a certain extent as interpretivism relates to a subjective nature and can produce ‘weak’ data (Myers, 2008).

Despite this, the research paradigm adopted in this study was an interpretivist paradigm and was the driver for the choice of methodology which was a mixed method approach. This paradigm was chosen due to the young participants within the research study and the research study taking place in a school context. It pays attention to and values what people say, do and feel and how this makes meaning behind the data of the research, therefore producing a high level of validity because the data produced can be trustworthy and honest, not biased or weak as previously stated. This research study relies on a mixture of qualitative and quantitative data which will produce both thematic and statistical data and is discussed more in full in the next section of this chapter.

**3.3 Research Design**

After the topic, AR and paradigm were established the research study was then able to take place using an appropriate mixed method approach to collect data to measure the impact of the use of digital reading strategies on reading attainment. This was deemed to be appropriate due to the classroom setting, the young participants undertaking the research study and was suitable to answer the aim of this research study. Traditionally quantitative data was used for scientific research and qualitative was used to analyse thoughts and feelings of research participants, however many scholars have found that using a mixture of both qualitative and quantitative data in research can increase the accuracy of the researcher’s finding and can uncover ‘information **and** perspective’, rather than just one take on the data (Denscombe, 2017; Twale, 2008). Therefore, mixed method data was deemed to be best suited to this research study. After careful consideration, the researcher decided that a mixture of qualitative and quantitative data would be analysed to ensure reliable, unbiased results (Bekhet & Zauszniewski, 2012) and she agreed that both information and learners’ views would provide the most accurate findings. Therefore, a mixture of reading scores from assessments and the opinion and views of learners was the best methodology to use in order to achieve the aims and objectives of the study. These methods included pre- and post-intervention questionnaires, FG and assessment data. The questionnaire and FG data were used to gauge learners’ views and opinions on, not only the intervention, but on how the learners feel about reading. A comparison of views was generated and an insight into any benefits or drawbacks of the intervention was given. Assessment data also provided a pre- and post-intervention comparison highlighting improvements, if any, in reading attainment scores. The data from the reading intervention, myON®, also provided a means to look at learners’ performances within reading attainment scores, provide evidence about student learning in the curriculum and in particular, their reading development, provide information about the intervention’s strengths and weaknesses and guide the researcher’s decision-making when completing the findings section of this research study.

**3.3.1 Participants**

Cohen et al. (2013) advise that in any research study, the participants should be representative of the intended group who will benefit from the findings of the research study. Therefore, the participants assessed in this research study have been chosen in a naturally arising way, meaning the action research is being undertaken by the participants’ usual classroom teacher and have not been grouped together for the sole purpose of this research (Cohen et al., 2013). Every participant gave consent to be included in the group and participate in the research. This method was chosen to be most practical as the research was part of a whole school initiative to improve reading attainment through the use of digital technologies.

Furthermore, a control group was deemed unnecessary and pre-intervention data was used to analyse instead. This was decided due to the high importance of implementing digital reading within the whole school, as stated in the SIP. This also ensured no learners were disadvantaged in any way or put in a position of discomfort. This will be discussed more in the ethics section later in this chapter.

A total of 17 mixed ability learners were part of the research group. The group consisted of 9 girls and 8 boys aged between 10 and 11 years old. All children are part of the same primary 6 class in a mainstream, Roman Catholic primary school in the West of Scotland. All participants were introduced to digital reading and took part in a six-week intervention comprised of a 45-minute lesson, 3 times per week. All children completed pre- and post-intervention questionnaires, FG and reading assessments. All participants have previously had DT lessons and are all able to navigate around a digital device. The participants had not been introduced to myON® before the start of the research study.

**3.3.2 Materials**

Digital devices were used throughout the six-week research block. All participants worked on the same laptop device from the start to the end of the intervention block. Laptops were issued to every participant with coloured stickers and corresponding codes to ensure learners’ devices were matched with assessment data, questionnaire data and focus group data anonymously. This is discussed in more detail in the ethics section of this chapter. All participants had personalised log ins for the digital reading intervention, myON®, which was discussed in the literature review that were unknown to the researcher. All data was collected via an admin log in on the intervention.

Participants were set tasks throughout lessons and were encouraged to take part in small quizzes, generated by the intervention, on the text they had been reading. This allowed the researcher to adapt any lessons throughout the intervention to suit learners needs. All digital reading material that participants engaged with were set to their ability through the intervention. Participants had the choice of any style of texts that they desired. Print texts, such as class novels or textbooks, were not read, within the classroom, throughout the six-week intervention block.

**3.4 Data Collection Methods**

The research study used an appropriate MM approach to collect data to measure the impact of the use of digital reading and fully answer the sub questions mentioned above in chapter 1. A mixture of qualitative and quantitative data was analysed to ensure reliable results (Bekhet & Zauszniewski, 2012). These methods included pre- and post-intervention questionnaires, FG and pre- and post-intervention assessments.

The research took place from May to mid-June 2022. All learners within the researcher’s primary 6 class completed and returned plain language statements (PLS) and consent forms at the beginning of May. The data of 17 learners in the class, was included in this practitioner study. Before the implementation of digital reading lessons, learners were told minimal information regarding the research study focus. In doing this, raw pre- and post-intervention data could be collected without learners altering their responses to questionnaires or focus group questions to suit the desires of the researcher (Cohen et al. 2013).

**3.4.1 Questionnaires**

Questionnaires are defined by Cohen et al (2013) as a series of questions that gather the thoughts and opinions of participants without the presence of the researcher. Many practitioner enquiries use questionnaires to gather opinions and viewpoints from participants to gain an insight into ‘what an individual believes, perceives, or feels about self, others and a variety of activities, institutions and situations (Mills and Butroyd, 2014. P. 56).

A variety of factors had to be considered when deciding on the type of questionnaire to use that best suits the research aim and the learners. A number of researchers discussed a specific criterion when planning questionnaires for children (Dillman, 2000; Fowler, 2005). They discuss the importance of using child friendly language and using a mixture of open and closed questions to provide a mixture of qualitative and quantitative data. The use of child friendly language reduced the risk of ambiguity and made the questions clear and easy for the participants to understand (Cohen et al, 2018). The MM approach to questionnaires provide information that can be compared, pre- and post- intervention, using graphs or charts, as well as information that is more personalised and less structured (Bailey in Cohen, 2011. P.321). These rules and criteria were followed when creating the questionnaires providing the researcher with a vast amount of data to analyse and draw conclusions from. The use of child friendly language enabled learners to fully understand what was being asked which then gave the researcher rich, reliable data.

The questionnaires were created online, using Microsoft forms. The online questionnaire was quick and easy to set up and generated graphs and reports to compare the data. The data was automatically collated saving the researcher a considerable amount of time. The questionnaires consisted of a mixture of ten open and closed questions. Open ended questions allow participants to type their response to the question in full and give meaning to responses. Closed questions can only be answered with ‘yes’ or ‘no’, or a limited set of answers, e.g. A,B or C or 1, 2, 3. The open questions allowed participants to answer why they had chosen particular answers in more detail providing more data on opinions of the research study topic. The closed questions used a mixture of multiple choice, Likert Scale and yes/no answers. The Likert Scale used in a questionnaire has a series of responses to choose from ranging from one preference to another. Likert scales are easily understood by the participants and easy for the researcher to analyse because they are easily quantifiable. It allows the participants to respond in agreement or disagreement, therefore not forcing them into taking a stand on an answer by only being able to respond ‘yes’ or ‘no’. It was deemed appropriate to use a 5-point Likert scale as inconsistencies in responses may have arisen if there were more than 5 options (Cohen et al., 2013). Despite the researcher finding these types of questions beneficial, there are scholars who avoid using Likert scale responses in questionnaires as they say participants often avoid the ‘extreme’ options thus not providing accurate data (Mukis, 2012). However, the researcher found this style of questioning beneficial as it generated a mixture of qualitative and quantitative data agreeing with Dillman (2000) who discusses the importance of using a mixture of open and closed questions in any small-scale research study.

Research shows that questionnaires are used a lot in small scale enquiries and are linked to FG data (Sudman and Bradburn, 1982). The research states that questionnaires are where the authentic, personal and genuine responses can be found especially when paired with FG responses (Mukis, 2012; Punch, 2014). In response, the researcher of this study deemed questionnaires to be a beneficial method of gathering data, as this is a small scale, school-based study that requires personal views of the learners in her class. The questionnaires were analysed using thematic and statistical data.

**3.4.2 Focus Group**

As well as questionnaires, there are many other ways of collecting data. Another relevant data collection method used within this type of research study is FG. FG consist of small gatherings of individuals who have been assembled by a moderator to gain information about a particular issue (Denscombe, 2017). Like any other research method discussed in this section, FG require a great deal of planning.. One of the most useful pieces of scholarship on FG comes from Kreuger & Casey (2015) who discuss FG being a carefully planned discussion in a ‘non-threatening’ environment. They state, in detail, how the planning and implementing stages of FG, in educational research, are by far the most important. In addition to this, a detailed ‘how to’ guide is established by Einsiedel, Brown and Ross (1996). Among the research examined, the main themes discussed throughout the literature is the importance of being clear of the aim from the start, ensuring the participants feel comfortable to speak freely with each other and the role of the moderator is to listen and direct the group interactions rather than leading the discussions (Einsiedl et al., 1996; Krueger and Casey, 2014; Morgan and Krueger, 1993). Although majority of the research found on FG in educational research was positive, some scholars believe interviews to be a better way to gather data from participants. They discuss the benefits of being able to find the ‘why’ from the questionnaires completed by participants (Jons, 1992). For example, if the participant answered in the questionnaire that they did not like using a laptop for reading, then the interview could find out why. FG were chosen instead of interviews for this research study, as the participants undertaking this study are children who feel more comfortable sharing their views as a group rather than individually which is more appropriate to a primary school setting. As stated in the section above, the information gathered from FG, when paired with questionnaire responses, can be invaluable to a researcher’s findings (Mukis, 2012; Punch, 2014) and as Docherty and Sandelowski (1999) stated, children are ‘the best sources of information about themselves’.

Research states that there should be no fewer than six participants in each group and no more than nine to ensure there is a range of views to analyse whilst still allowing the moderator to be able to manage the group (Descombe, 2017: 206). Within this study, two FG were established and the learners in each group were carefully selected ensuring mixed ability grouping. This decision was made in line with Mukis’ (2012) literature that states that mixed ability groups are advised for focus group settings to ensure the conversation flows. Using mixed ability groupings may also allow the researcher to find patterns in participants’ views compared to their ability. For example, lower ability learners from both groups may have the same view or opinion on the intervention and this can be spotted when comparing the data from each group. However, Simons (1982) suggests that some lower achieving participants may feel intimidated by other, more able, learners and suggests a one-to-one setting may be more beneficial. With this in mind, the researcher gave all participants the choice, whether to participate in a group setting or have a smaller, more intimate discussion, with the researcher, and all learners chose to be part of the larger focus group. Learners were also told the theme of the focus group before participating and gave their consent to be a part of the group. This is discussed more in detail in the ethics section of this chapter.

FG had many advantages within this type of research study. The FG were a low cost and time efficient way of gathering data and the information gathered was extensive and reliable. As well as advantages, there were also some challenges when using FG. The participants often spoke over one another and tried to answer questions for each other or finish each other’s sentences. As a result of this, the researcher who was moderating the group had to intervene to ensure all participants were able to give their own, personal views and opinions in order to reduce any bias (Krueger and Casey, 2014). It also took a long time to plan the groups and ensure the questions were not leading (Grady, 1999). On the other hand, the data gathered was useful to back up answers within the questionnaire where the researcher could ask follow up questions with no delay. This was helpful to answer the original RQ, especially when links were made with the summative assessment data which will be discussed in the next part of this section.

**3.4.3 Pre- and Post- Assessment Data**

Within this MM research design, both qualitative and quantitative data was analysed. As stated in the Research Design section of this chapter, the author deemed it relevant to include not only qualitative data through questionnaires and FG, but to include quantitative pre- and post- test assessment data which is more suited to educational research studies. The majority of experimental research studies do not lend themselves to a classroom setting (Punch, 1998) due to a variety of ethical issues, which were discovered by the researcher, during the search strategy process. Most experimental research data that use pre- and post- test assessment data will include a control group and compare results by denying one group expected benefits of the study. This was deemed unethical within the researcher’s classroom setting of 17 learners. Therefore, the researcher adopted a pre-experimental design: the one group pre-test/post-test design (Cohen et al., 2017). This design is more suited to research studies that take place within education and does not include sampling or control groups. This method also allows the link between variables to be identified and measured (Boudah, 2011), which, within this research study’s aim, is the extent to which the intervention improved reading attainment of P6 learners. It is important to ensure all pre- and post- assessments are administered correctly to ensure that, if it is the case, the researcher can conclude that the reading intervention had a positive impact on the reading attainment of the participants and thus can help to contribute to the actions of the Scottish Government’s policy group IPRA to highlight projects that develop beneficial teaching approaches (Scottish Government, 2016).

**3.5 Data Analysis**

On completion of the six-week intervention, quantitative and qualitative data was carefully analysed in a variety of ways. A vital part of the research study was to analyse the data gathered from pre-intervention assessments. As Opie (2004) states, statistics have their place and, when used appropriately, they are an important part of the ‘armoury’ for educational research (Opie, 2004, p.9).

The first step of the data analysis, was to make meaning of the raw data. Reports, from the assessments, were generated through the myON® intervention which meant the researcher could collate scores quickly and efficiently. Paired t-tests were used to compare both sets of data. Paired t-tests are used in statistical analysis to compare two population means where there are ‘before and after’ observations or tests (Shier, 2004. P.4). T-tests determine how significant the differences between two group means are (Glen, 2017). Within the analysis the researcher calculated the mean scores for each participant pre-and post-intervention giving a clear comparison between results. This enabled the researcher to quickly analyse where most of the scores were ‘located’ (Cohen et al., 2017, p. 762). The t-tests generate a ‘p- value’ that represents the probability that the results from the data occurred by chance. Low p values (<0.05) indicate the data change did not occur by chance (Glen, 2017). These scores were then displayed in an excel bar chart side by side, to show clearly any change in reading scores after the intervention. Next, the range score was identified to ascertain the difference between the highest and lowest assessment scores. This was then compared to the pre-intervention range, which shows the ‘gap’ between learners, and conclusions were drawn from these reports, as to whether the reading intervention had an impact on closing the ‘gap’.

In addition to the quantitative data, the qualitative data that had been collected was analysed. This research study followed aspects of a thematic analysis method of Braun and Clarke (2006). Themes, and patterns were identified when analysing the data from the FG and questionnaires. The questionnaires were created using Microsoft forms. This platform has a ‘collating’ feature when analysing data. This feature allowed the researcher to quickly identify any similarities across the answer forms from the questionnaires, highlighting any emerging themes or patterns throughout the participants’ answers. Microsoft forms also generate percentages of participants who have answered similarly and create pie charts to display this information. Although this saved the researcher a lot of time, it is important to state that if the data is not analysed thoroughly by the researcher then the credibility of the results could be questioned (Nowell et al., 2017). The focus group data was analysed in a similar way to the questionnaires, except all percentages and themes or patterns had to be manually identified by the researcher. Codes were created when any similarities of answers were identified and then grouped into two broad themes (Cohen et al., 2017). The data was re-read a number of times, allowing the researcher to infer meaning behind the data. This minimised the researcher’s preconceptions and ensured a rigorous analysis of the data. The FG data was then compared to the themes generated by the Microsoft forms data. As with the questionnaires, the focus group data had to be thoroughly analysed to enhance the credibility of the results and minimise any limitations of the study (Robson, 2002).

Both sets of quantitative and qualitative data were then compared to determine if any themes or trends matched to corresponding data. This allowed the researcher to determine if the results and responses confirmed an answer to the original RQ.

**3.6 Limitations of Methodology**

As with any primary school-based study, there were many limitations and potential barriers in completing the methodology.

Firstly, the school in which this research study was conducted, has limited access to digital devices. There is a total of 20 laptops and these are shared between all P6 and 7 classes. The researcher had to create a timetable for all classes to ensure the participants had access to the devices at the correct time. In addition to this, the research study took place in the summer term which is the same time as all P7 learners within the school have to complete the Scottish National Standardised Assessments (SNSA). This restricted when the intervention could take place and added to the already narrow time constraints. As stated earlier in this chapter, the questionnaires were administered using an online platform meaning the children had to also use laptops to complete questionnaires before and after the intervention. This became difficult to ensure the devices were available when the participants needed to use them. This barrier was brought to the Head Teacher’s attention and she responded by enabling the participants within this study to use the P4 and 5 laptops for the entire research study. Moving forward, more digital devices will be required to ensure consistency and accessibility of devices when implementing digital reading lessons.

As previously mentioned in this chapter, the participants were put into 2, mixed ability FG. Occasionally, within one of the groups, some participants would have a stronger voice than others within the group meaning not all participants were contributing equally. This confirmed Simons’ (1982) point, previously mentioned in the FG section of this chapter, that some learners may have become intimidated. This meant the researcher had to step in and redirect some questions or intervene if an answer was irrelevant or overpowering the group. This caused some limitations as the researcher found herself changing her role more in one group than in the other. Reflecting on this, the researcher considered whether this had an impact on the other participants within the group and their answers to the focus group questions.

Other possible limitations within the methodology process were based around the validity of the data collection methods. It was important to ensure planning of data collection was thorough to minimise issues with reliability of results. This will be discussed more in the next section.

**3.7 Validity and Reliability**

It is crucial to ensure that the research study is underpinned by validity and reliability (Cresswell, 2013). The researcher carefully considered the AR design, the paradigm and took time to choose appropriate methods of data collection (Cohen et al., 2013). This can be difficult as the researcher is part of the world in which the research is taking place and therefore, can never be completely objective, however, steps should be taken to ensure the participants’ views and opinions are clear and valid (Cohen et al., 2013).

As well as views and opinions gathered through questionnaires and FG, pre- and post- assessment data needs to be consistent to ensure reliability (Boudah, 2011). Other issues may arise out-with the classroom setting that may have an impact on the results, such as home life, emotions, materials or additional support needs. To maximise reliability of results, the researcher looked at a holistic view of learners’ achievements across reading including other classroom assessment data and other intervention data that may also show a change in performance within reading.

It is important to note that Cohen et al., (2013) discuss that ‘testing reading may require several components…’ and participants may not be used to certain questioning so it was important that the researcher introduced learners to specific question styles before the intervention to avoid confusion or misunderstanding.

These issues of reliability and validity of participants’ results can all be minimised through thorough preparation and planning of a clear and consistent research design, all while ensuring ethical issues have been considered. The following section will discuss the ethical considerations for this research study.

**3.8 Ethical Considerations**

Firstly, ethical approval was granted from the Ethics Committee at the University of Glasgow, Ethics Panel (Appendix A). Throughout the research study the values and guidelines from the Scottish Educational Research Association (SERA, 2005) and the British Educational Research Association (BERA, 2009) were consulted and followed. These policies highlight the responsibility of the author of the research and clearly discuss that the main focus of any research project is the participants and their views.

As a teaching professional it is important to ensure the research underpins the values from the General Teaching Council Scotland (GTCS) ‘Code of Professionalism and Conduct’ and ‘Standards for Full Registration.’

Next, the researcher sought and obtained approval from the Head Teacher of the school to carry out the research and confirmation from her that the school would be using the myON**®** intervention for digital reading. As the anonymity of the participants was protected and the research was small scale, permission from the local authority was not required.   
Finally, all participants and parents were issued with Plain Language Statements (PLS) and consent forms (Appendix C, D, E and F). As the participants were under 16 years old their PLS and consent forms were modified to ensure they fully understood the research study and what was being asked of them. This also ensured that their age did not diminish their rights (Fine, 1998). Details of the researcher were given to parents to ensure they could contact her with any questions or queries about the research study. All consent forms and PLS were checked by HT before being distributed to participants and their families. Participants were advised that they could leave the research study at any time and parents could request a copy of questionnaires and FG questions at any time (Appendix G and H).

The participants’ education was at the forefront of the entire research study and the participants were not put in any stress or harm throughout. This is in line with the professional guidelines from SERA, which states that all participants should be treated fairly throughout (SERA, 2005).

Additionally, due to the online questionnaires, the researcher had to seek ethical approval for dealing with non-standard human data (Appendix I). This ensured that the researcher knew how to store and share the online data correctly. The researcher consulted the General Data Protection Regulation (GDPR) to minimise any ethical issues with participants’ data that was stored online.

Throughout the research study, anonymity was assured to all participants. Learners should not be disadvantaged in any way throughout the study and should not be identified in data gathering (Anderson et al., 2007). All data was stored with a password protected file and names of participants did not show anywhere on assessments or questionnaires. All responses were anonymous. Although it is important for participants to remain anonymous, each participants’ questionnaire responses were matched with a letter code to their assessment data. This was deemed necessary to allow the researcher the ability to identify any patterns or trends in data. For example, if a participant responded negatively to the questionnaire and scored low in assessments, then a link could be made between both sets of data.

**Summary**

Throughout this research study, a mixture of quantitative and qualitative data was gathered. However, it is worth noting that the data collected from the questionnaires and FG are limited to the views and opinions of a specific number of participants in an individual P6 class in a single Scottish primary school. The data gathered was specific to the individual class and further studies in this field is required to ensure any ‘generalisability’ (Hopkins, 2008. p.165) of results to the whole population. The findings produced from the methodology analysed in this chapter will be discussed in the following chapter.

**Chapter 4- Findings and Discussion**

**Results**

This research study set out to determine the links, if any, between digital reading and reading attainment in a P6 class. This chapter will discuss the results of the qualitative and quantitative data gathered and the findings will be presented and discussed, highlighting any themes or trends within the data that would answer the original RQ.

Digital reading was integrated into reading lessons over a six-week period. Overall the response from participants was very positive and learners enjoyed the change to reading lessons, engaged with the intervention and gave varying reasons for doing so.

**Questionnaire and Focus Groups Findings and Discussion**

Questionnaires and FG were completed pre- and post- intervention allowing the researcher to gauge a change, if any, in views and opinions towards reading.

Within the pre-intervention questionnaire results, it became quickly apparent that participants were not engaged in reading and had negative views of reading, as expected by the researcher. A theme emerged, after asking the participants ‘Do you enjoy reading? Why/Why not?’, that participants found reading ‘boring’ and were not engaged. They discussed how they preferred other subjects, didn’t like book choices and didn’t find reading interesting.

* *[1] ‘I don’t like reading because I find it boring because I want to be active all the time and I don’t like staying still to read.’*
* *[2] ‘I don’t enjoy reading because it’s not fun and I would rather be playing with my friends which is fun.’*
* *[3] ‘I do not like reading. I don’t like the books in class and I don’t have any books at home.’*
* *[4] ‘Reading is boring. I don’t like it because I get a sore head when I read and I find it hard to concentrate.’*
* *[5] ‘I don’t like reading because I prefer watching stories on TV. I understand them better that way. Reading isn’t exciting for me but a film is.’*

This was also evident in the pre-intervention FG. Participants were able to discuss in more detail their opinions of reading. A similar theme emerged within the pre-intervention focus groups, where participants discussed how reading is ‘boring’ and they dislike reading books.

* *[1] ‘I don’t like reading because I think it’s boring. It’s not exciting and when it’s reading time in class I really don’t like it.’*
* *[2] ‘Reading isn’t good. It’s not exciting. I’d rather be doing maths and I don’t really like maths either.*
* *[3] ‘I don’t like it. Probably because it’s boring and I don’t like things that are boring.’*

Within the Microsoft forms analysis, it showed the word ‘boring’ or variations of the word was used by 52% of participants. 29% of participants also used the word ‘dislike’ or ‘don’t like’. This allowed the researcher a starting point for her analysis of results and generated themes, supported by her analysis. Again, it is important to note that the online questionnaire analysis is only a starting point for the researcher’s analysis.

In contrast to the ‘boring’ theme, after carefully analysing post-intervention questionnaires and FG data, overall, participants’ views and opinions of reading had changed. A theme, that arose, after analysing the post-intervention questionnaires several times, was that participants found reading ‘fun’ and many participants discussed that after using a digital intervention for reading that they enjoyed reading more now than before*.*

* *[1] ‘Reading is fun because I like using the laptop to read and it sometimes reads it back to me so I prefer that.’*
* *[2] ‘I like reading. I think it’s fun when we read using myon.’*
* *[3] ‘I enjoy reading because it is fun.*
* *[4] ‘I enjoy reading because of the pictures.’*

Again, this was supported when reviewing the FG data. Responses from participants indicate that using the intervention for reading was more enjoyable. Within the FG, they were able to discuss in more detail why they found reading ‘fun’ and ‘enjoyable’.

* [*1] ‘I think it’s so much fun to read. I like how we can use laptops to read. Normally I play games on laptops.’*
* *[2] ‘I enjoy reading now because I can get on myON and get it to read to me. I enjoy this more because I like to read along with the book.’*
* *[3] ‘I think reading is fun because its enjoyable now.’*

On the other hand, a couple of participants mentioned drawbacks to using the intervention.

* [1] *I don’t really enjoy reading online because I like the feel of a book. I have loads of books at home and I prefer holding a book. The online reading takes ages to get into and sometimes I forget my password.’*
* *[2] I don’t really like reading online because the laptops take ages to set up and sometimes they’re not charged, I prefer to just pick up a book.’*

This reiterates the point made in the benefits and drawbacks section of the literature review in chapter 2, that if the devices are not used correctly then it can have a negative impact on learners’ performance (Sann, 2013). It is important that teachers ensure laptops are fully charged and passwords are accessible for learners to enhance their learning experience.

Another key theme that emerged in pre-intervention questionnaire data was that learners felt that they weren’t ‘good’ at reading and they didn’t understand some texts. Participants discussed that they find reading ‘hard’ and that they don’t do well in reading lessons. This was supported in the FG where participants agreed with each other that they didn’t achieve as well in reading as they did in other subjects.

* *[1] ‘I’m not good at reading. I always find it hard. I can’t keep up with other people reading in my class.'*
* *[2] ‘Reading isn’t for me. I think it’s because I’m bad at it. Like, I’m a slow reader.*
* *[3] ‘I’m not good at reading because other people are better than me and get better marks.’*

These findings indicate that, pre-intervention, participants were not achieving in reading and they were aware of it. The researcher’s claim that learners were not attaining and were not engaged was proven when analysing pre-intervention questionnaires and FG data.

Post-intervention, a contrasting theme became apparent and the participant responses indicate that the digital reading intervention offered support to learners who previously discussed learning barriers in reading. The intervention was inclusive and the flexibility of the online tools allowed some participants to feel like they had made progress in reading and as a result they became more confident in their reading abilities.

* *[1] ‘­­I love how the book can be read to me. I understand the book much more and I can follow along easily. I think this helps me to read better.’*
* *[2] ‘Myon gives me books I might like and I find these books really good to read. I don’t really get stuck or bored on them and if I don’t know a word I can easily find out what it means using the wee magnifying glass.’*
* *[3] ‘I’m actually not bad at reading. My points on myon go up every time a do well in a quiz and then I try and read some more to get more points. It shows me I’m actually good at reading which I like. As well, normally it takes me a while to get started on a book because the print can be too small but I use the tools to make it bigger and it helps me.’*
* *[4] ‘I love reading on myon. Probably because it’s not like actual reading. The teacher hasn’t decided what I’ve to read and I think that’s better because I can pick books I like which makes me a better reader. My mum says my reading is improving.’*

The range of responses from participants throughout the data shows how the use of the myON**®** intervention has supported them overcome learning barriers. The various responses support the previously mentioned (Chapter 2) view of Prensky (2012) who discusses that learners can become disengaged with learning and discouraged with educators who do not incorporate digital devices into their practice. This, along with priorities set out in the National Improvement Framework mentioned in chapter 1 to ‘develop the skills and confidence of educators in the appropriate and effective use of DT to support learning and teaching to develop confidence of learners’ (Scottish Government, 2014. p.4) all support the responses of participants. This reiterates the need for educators to adapt their practice to ensure their lessons have a range of engaging, stimulating materials to support the learning styles of DN (Prensky, 2012).

Furthermore, the post-intervention questionnaire and FG responses showed participants enjoyed reading at their own pace and could contribute to class reading content in their own learning time (Strommen, 2014). This enabled learners to read at their own ability, complete differentiated work and complete reading content more suited to their needs and learning style (Goundar, 2011).

* [1] *‘I like being set a task and reading it myself. Sometimes I lose my place when I’m reading with the rest of the class.’*
* *[2] ‘ Sometimes if I have to share a book with [PUPIL NAME] he can read faster than me and I have to just read at his speed and I miss half the story but when I am on myon I can read at my own speed and finish my work the way I want to. It helps me to understand what I am reading more because I have read it all myself.’*
* *[3] ‘I like working with my partner for most things but when it comes to reading I far prefer working on my own. I can read the books I like and then we can work other things together after I have read it myself. This is much better because I don’t feel awkward asking my partner to explain things and I can use the myon tools to help me and teach myself instead of having my partner teach me.’*

Throughout the FG, participants discussed different ways in which they like to read and learn. The above learners are all learners who usually benefit from mixed ability paring. They normally require support or encouragement to complete reading tasks independently so it was encouraging to hear them discuss how they would now prefer to teach themselves. This was also supported within their assessment data that showed an increase in number of questions attempted in pre- and post- intervention assessments which will be discussed more in full in the next section of this chapter.

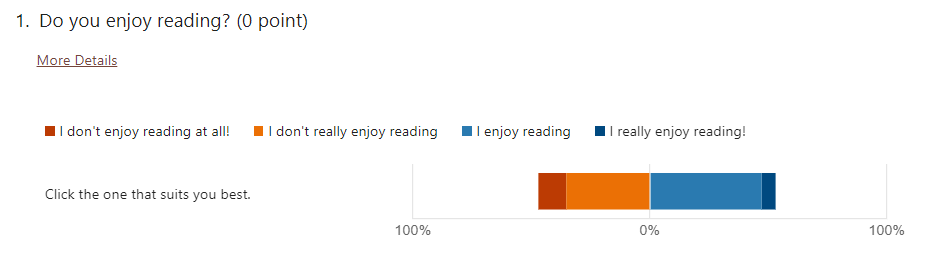
Overall, participants spoke positively about the intervention. As the class teacher, it was encouraging to hear them speak highly of recent reading lessons and be motivated and excited when discussing the intervention. Overall, the opinions and views of participants clearly shifted over the six-week block of lessons. The qualitative data showed an increase of enjoyment of reading within the class. As shown in figure 3 and 4 below, the majority of learners were negative and disengaged in reading before the intervention was introduced and almost all learners are now enjoying reading more. 

Figure 3: Pre-Intervention Example Question.

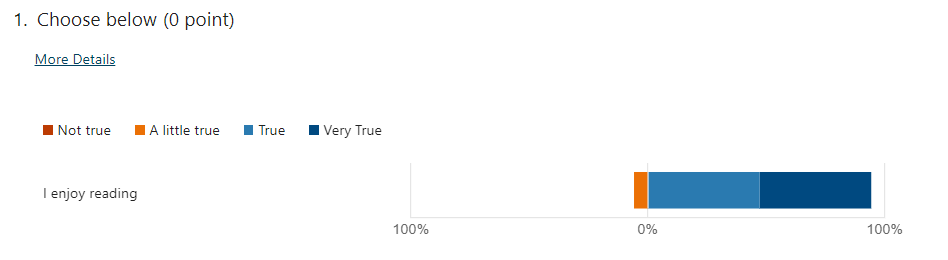


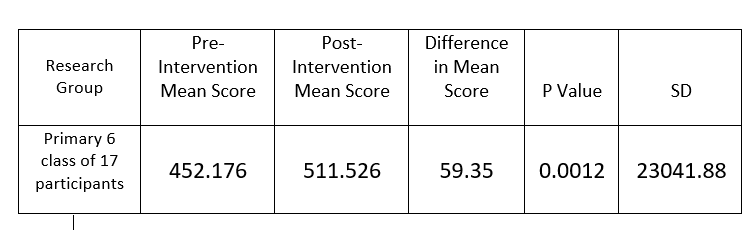
Figure 4: Post- Intervention Example Question.

Conclusions can be made from the questionnaire data, supported by the more in-depth answers from FG, that learners views and opinions have changed due to the digital reading intervention. However, the novelty of the laptops could have an effect on the positive opinions and over a longer period of time may wear off. Digital devices must be used in a meaningful and engaging way if the digital reading lessons were to continue (Prensky, 2012).

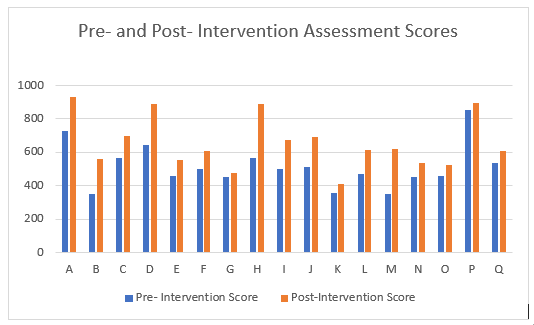
**4.2 Pre- and Post- Intervention Assessment Findings and Discussion**

The quantitative data was analysed in a different way to the qualitative data. However, both sets of data were then compared to confirm any trends or similarities in results. The findings from the pre- and post- assessment data was analysed using paired sample t-tests to compare the significant differences, if any, between pre-intervention and post-intervention scores. A p value was set at 0.05, indicating significant statistical difference when p<0.05. The Standard Deviation (SD) was calculated using an online calculator to determine the varying results. Finally, the data between the pre- and post- intervention assessment scores was compared to determine if the trends in data could answer the original RQ and conclude if the digital reading intervention had an impact on the reading attainment of learners in a P6 class.

The paired t-test showed the mean difference between pre- and post- assessment scores had increased significantly (Table 3). The value of p is 0.0012 meaning the likelihood is that the results from the data did not occur by chance and therefore, the intervention may have had a positive impact on the changes in assessment scores for the participants in this study.

  
Table 3: Paired t-test results. Mean Scores.

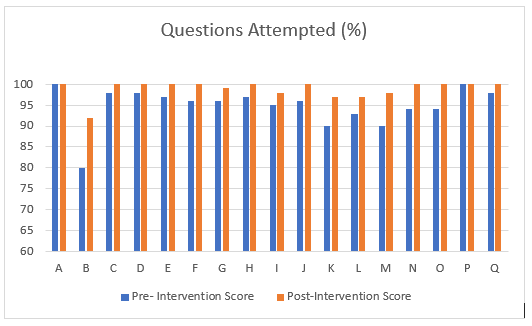
Analysis of the mean scores show that overall the mean score of the group of participants increased by 59.35, after the six-week block. Conclusions can be drawn that, paired with the positive responses from learners about reading post-intervention, the higher mean score indicates the participants benefited from the intervention in terms of their own views and opinions and their attainment.

Further analysis of the data showed significant improvements for almost all participants. Each participants’ assessment scores increased over the six-week block with the majority of participants improving significantly. The improvements in pre- and post- intervention scores between the lowest attainers and the highest attainers (Table 4) were also significant. The highest attainers pre-intervention remained the highest attainers post-intervention. However, two out of the three of the lowest attainers pre-intervention increased and surpassed others in the group with their post-intervention scores. The mean score of the lowest three scores and the second lowest three scores were calculated to analyse the ‘gap’. The mean score of the lowest three attainers was 350 pre-intervention and 455 post-intervention. The mean score of the next group of three learners was 452 pre-intervention and 522 post-intervention. The ‘gap’ between the lowest attainers and the next group of learners decreased from 152 points to 67 points. This was a key finding in the results of this research study. This indicates the possible implementation of the intervention over this short six-week block has had a positive impact on the attainment gap of learners. As previously mentioned in the literature review in chapter 1, studies have found that the effective use of digital technologies in classrooms can help to close the poverty related attainment gap (Scottish Government, 2016) and although these studies are small scale, there is a consistent link throughout the research between digital technologies and raising attainment (Scottish Government, 2016; Strommen, 2014). This also confirms the themes within the FG responses that DT can support those with a barrier to learning and learners who have additional support needs.  
   
Table 4: Pre- and Post-Intervention Assessment Scores

Again, it is important to note that there could be a number of reasons for the increase in attainment of the participants, including the novelty of this reading intervention, test conditions and home life (Boudah, 2011). However, the t-test score indicates that with such a low p (probability) value, the changes in data did not occur by chance and the likelihood that the intervention had a positive impact on the attainment of learners in this research study is significant. It is also important to note that due to the number of participants within this study, further research in this field, for a longer period of time (Cohen et al., 2013) would be beneficial to prove any strong answers to the original RQ.

In addition to reading assessment scores, reading age results of participants were also analysed (Table 5). Every participants’ reading age increased after the six-week block. These results indicate a clear improvement in reading skills throughout all participants. Some participants had significant improvements. There are many factors that could have influenced the increase in reading age. The participants could have been more used to or ready for an assessment the second time. Participants may have had interruptions in the first assessment, although the researcher tried to minimise this as much as possible, it is important to note this down if this has happened. Participants may have had other things happening out side of school that could have influenced their lower scores pre-intervention.   
Table 5: Reading age comparison (Pre- and Post- intervention)

This supports the responses from learners and the theme within those responses that indicate learners are more confident within reading and feel their reading attainment has increased throughout the study.

Finally, an important statistic to mention that the researcher found of interest was the amount of questions attempted within both assessments (Table 6). As mentioned in the questionnaire and FG findings and discussion section, the data indicates an increase of questions attempted in the post-intervention assessments.   
Table 6: Percentage of answers attempted, pre-and post-intervention comparison.

This reiterates the points made in the literature review in chapter 1, that using digital devices in classrooms can increase satisfaction, motivation and engagement amongst learners (Fried, 2008; Hyden, 2005). The increased engagement within this data indicate that the implementation of the digital device within reading lessons has had a positive effect on the participants and has allowed them to answer more questions resulting in higher reading assessment scores. Therefore, contributing to the findings that the use of digital reading, in this individual P6 class, has had a positive effect on the reading attainment of learners.

**Chapter 5- Conclusions and Recommendations**

**5.1 Key findings**

The aim of this research study was to determine the extent to which, if any, digital reading has on the reading attainment of a P6 class. In order to achieve this aim, a pre- and post- MM approach was used over a six-week block. Questionnaires, FG and assessment data was thoroughly analysed giving the researcher a clear and reliable indication of the impact of the intervention on participants’ attainment. All 17 participant showed an increase in assessment scores, motivation, engagement and overall reading attainment. Questionnaires and FG data indicated participants had an increased engagement and motivation for reading. The results of the qualitative data indicate that the participants involved felt more motivated to read when using a digital device, they felt more supported and overall, they preferred being able to work at their own pace when digital reading. The experience revealed that laptops made a positive contribution to reading lessons and learners’ engagement of reading lessons. Furthermore, the quantitative data showed that all participants within this study had an increased reading attainment from the beginning of the study to the end. The paired t-tests showed a significantly low p value indicating the probability that the scores reflect the implementation of the intervention were high. This showed that learners benefited from different digital reading strategies and using a range of online tools that supported them in reading. The results of this research confirm the importance of skill development for both teachers and pupils in DT to maximise the impact on learning. Furthermore, the results from this research study confirm why the Scottish Government have recognised the importance of the use of DT in education.   
Although there is a plethora of research based on the benefits of DT in the classroom, there is still a need for more larger-scale studies, especially in primary education. Finally, for digital reading to have an effective role in increasing reading attainment in all learners, there needs to be a consistent approach to teaching and learning throughout all stages and all schools. Every educator must ensure they are successfully implementing interventions to support the needs of every learner in their class.

**5.2 Limitations of study**

Limitations within any classroom-based research study are ‘inevitable’ (Lederer, 2000, p101) and this section will discuss the limitations within this research study.

With hindsight, the decision to send consent forms home to parents, then wait for the return of the completed form before beginning the methodology created some delays and added to the already limiting time constraints. One participant was unable to return forms as they had been misplaced so the researcher had to send another consent form which was also misplaced meaning the researcher then had to telephone the participants’ parents. It may have been better to send the consent form with the information and provide a follow up call to discuss consent with parents in the following days. This would have sped up the consent process and allowed the researcher more time to complete FG and questionnaires all whilst keeping in line with the consent standards set out in SERA (2005). As Denscombe (2017, p.186) correctly states, getting people to take part in a research study and to answer questions is a challenge in its own right.

As discussed in chapter 3, this was a small-scale research study based in a primary 6 classroom and the research was conducted during a busy, final term of the academic school year. This put time constraints onto the study meaning the researcher was limited to a short period of time to conduct the intervention. The research study was very small scale and consisted of 17 participants limiting a wider range of views or assessment data meaning the study was too small to find a significant relationship between the intervention and the data outcome. This study was able to answer the RQ with regards to the researcher’s learners within her class, however, to provide a precise answer to the question, ‘what impact does the use of digital reading have on the reading attainment of a P6 class?’, a larger study would need to be conducted. Further and more extensive research is required to assess longer term impacts of the intervention on reading attainment. This study was a starting point for any future research that will explore digital reading and its links to reading attainment in a P6 class further.

**5.3 Recommendations for further study**

The findings of this research study provide evidence that digital reading strategies can be used in a primary 6 classroom to enhance reading attainment of learners. The increased assessment scores, along with the views and opinions of participants demonstrate the positive impact that digital reading has had on reading attainment. With that being said, within any research study, there will always be recommendations for future studies and the author of this research study noted several recommendations.

Firstly, as this study was completed within a primary classroom of 17 learners, the sample size was restricted and is not a full representation of the learner population at this stage. This, along with the vast amounts of literature found on using digital reading with ASN learners and universities, emphasises the need for further investigation using a larger demographic of participants. This research study was small scale; therefore, a larger subject group would confirm if the same successes found in this research study can be assumed to be true of all representatives at all stages of learning.

In addition to this, the researcher found very limited literature based on the intervention, myON®. In future studies, researchers should also incorporate international studies in their research to establish a clear understanding of the intervention in order to report on the benefits and setbacks of using the intervention as shown in this research study.

Local Authorities could develop a digital device policy for educators who are unsure how to use devices safely and effectively. Additional CLPL training for educators and support staff could be implemented to build on existing technology available in schools. The researcher has previously organised small scale CLPL sessions for colleagues in her classroom and she is currently the Literacy lead for the school, so going forward, she could organise bigger training sessions, if deemed appropriate by the Head Teacher. This could be incorporated within the dissemination process of her research.

**5.4 Dissemination Strategy**

The Scottish Government has placed great emphasis on closing the poverty related attainment gap and has placed an even greater emphasis on challenging the teaching profession to find and develop strategies that improve teaching and learning and subsequently help to close the gap (Scottish Government, 2015) . Therefore, it is fundamental that any positive outcomes, established during research study, that add, in any way, to closing the gap for disadvantaged learners, are disseminated thoroughly.

In response to this, the findings of this small-scale research study will be shared with many relevant stakeholders. Throughout this research study, the researcher followed the D-cubed dissemination strategy (Australia Learning and Teaching Council, 2009) which was recommended by staff through The University of Glasgow’s Moodle site. This strategy was designed to increase opportunities for achieving productive change in learning and teaching, which is the ultimate goal of this research study. This strategy encourages researchers to not leave the dissemination part of the study till the end, but to engage with potential stakeholders throughout the evolution of the project (Hinton et al., 2009). The 3 stages of the strategy are shown below in figure 2, engage, assess and transfer.

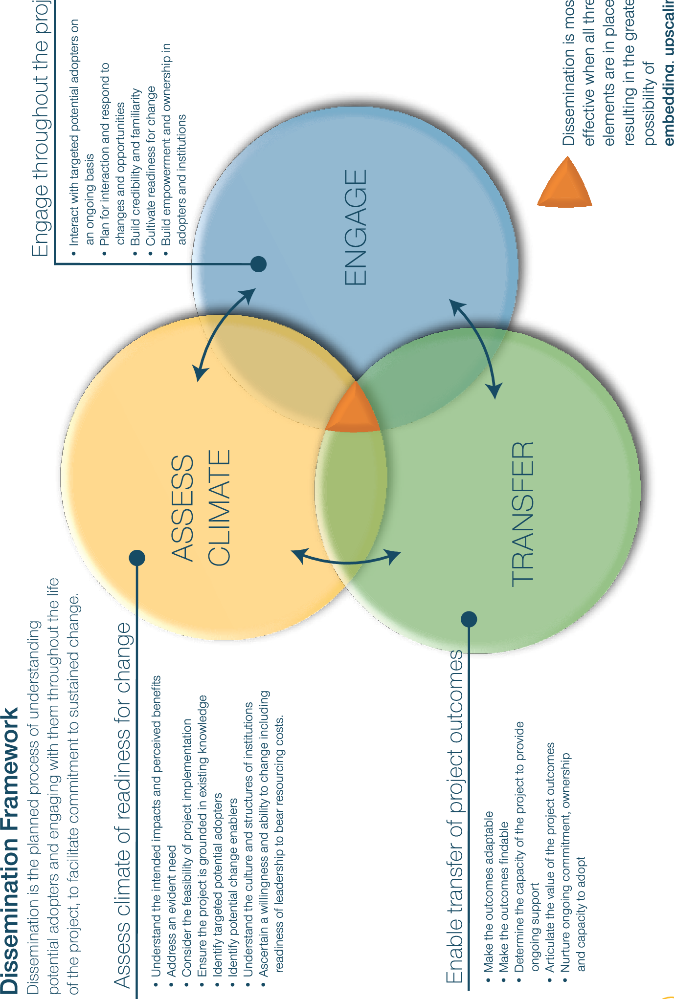


Figure 2: The D-Cubed Guide: Planning for Effective Dissemination (2009).

Firstly, the researcher engaged with stakeholders throughout the projects’ development. This was in line with the ‘engage’ stage of the dissemination strategy. The Head Teacher of the school where the research study took place has placed a strong emphasis on improving digital learning and as part of the SIP, she has set aims within the school to raise attainment in reading, therefore the findings from this research study will be of interest to her and other members of the Senior Leadership Team (SLT). The researcher will prepare a summary of the findings and will present to the SLT and discuss a more in-depth presentation for the rest of the teaching staff within the school. The presentation will not only be shared with the literacy working party but with the whole school teaching staff to demonstrate ways in which the research study can have a positive impact on teaching and learning throughout the school and how the practice can be adapted to suit all stages (SERA, 2005). In addition to this, the researcher identified ‘potential change enablers’ (Australia Learning and Teaching Council, 2009) through other schools within the cluster and will seek to present the aim, findings, evaluations and achievements of the research study to the other schools within the school cluster community, as previously mentioned in the recommendations for further study section. The schools within the cluster often meet to discuss ways to improve experiences for all learners and would benefit from the findings of this research study. If this is well received and appropriate, the research will be shared at a Local Authority level as a Career Long Professional Learning (CLPL) session.

Secondly, the researcher wanted to ensure the outcome of the research study were ‘findable’ so she will prepare a summary of the data, findings and impact of the study for pupils and a second, slightly more detailed summary for parents. The researcher has experience of contributing to parent council meetings bi yearly and will plan to present a summary of the findings to the members of the council at the next meeting.

Finally, the researcher would seek opportunities to reach a wider educational audience and if appropriate and the opportunity becomes available, the researcher would present the findings of this study at a conference such as the Scottish Learning Conference or the Digital Learning conference to educational leaders within Scotland and beyond.

As the researcher is a reflective practitioner, and has had many opportunities to share professional enquiry within her school community, she is aware of and fully understands the importance of the GTCS (2012) Standards 3.2.1 and 3.4.2. While it is important to share learning with colleagues, it is also important to protect the anonymity of the participants and ensure all data follows the ethical considerations mentioned in chapter 3. This will continue to be the researcher’s priority during the dissemination process of the research study.

**5.5 Conclusion**

The aim of this research study was to examine the effect the use of digital reading in a P6 class has on the reading attainment of learners. The research study aimed to determine whether the use of an online reading intervention improved learners’ attainment over a six-week period. The findings of this research study indicate that digital reading can have a positive effect on the attainment of P6 learners. Digital devices increase learners’ engagement and motivation to read and therefore improve reading attainment. Furthermore, digital technologies used in classrooms are a powerful way to develop learning and teaching. However, this is only the case if used effectively. The use of digital reading seemed to have a positive effect on the participants in the study and their views on reading shifted from before the intervention, to after. They enjoyed being able to work independently and found the intervention supported them in reading lessons. The data from this study showed an increase in reading attainment for all participants and the researcher has deemed it appropriate to continue digital reading within her classroom. Again, these findings are limited to a small number of learners in a single context and more research in this field is required, on a larger scale, to confirm the findings from this research study.   
As the world becomes digitalised, it is vital that educators are up to speed with the expectations the Scottish Government (2016) have set around the use of DT in education. The way learners learn is changing so the way teachers teach must also change. As John Swinney, Deputy First Minister and Cabinet Secretary for Education, said:

‘It is only by working together that we can realise the potential of digital technology for all our children and young people.’   
(Scottish Government, 2016. P. 6)

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**Appendices**

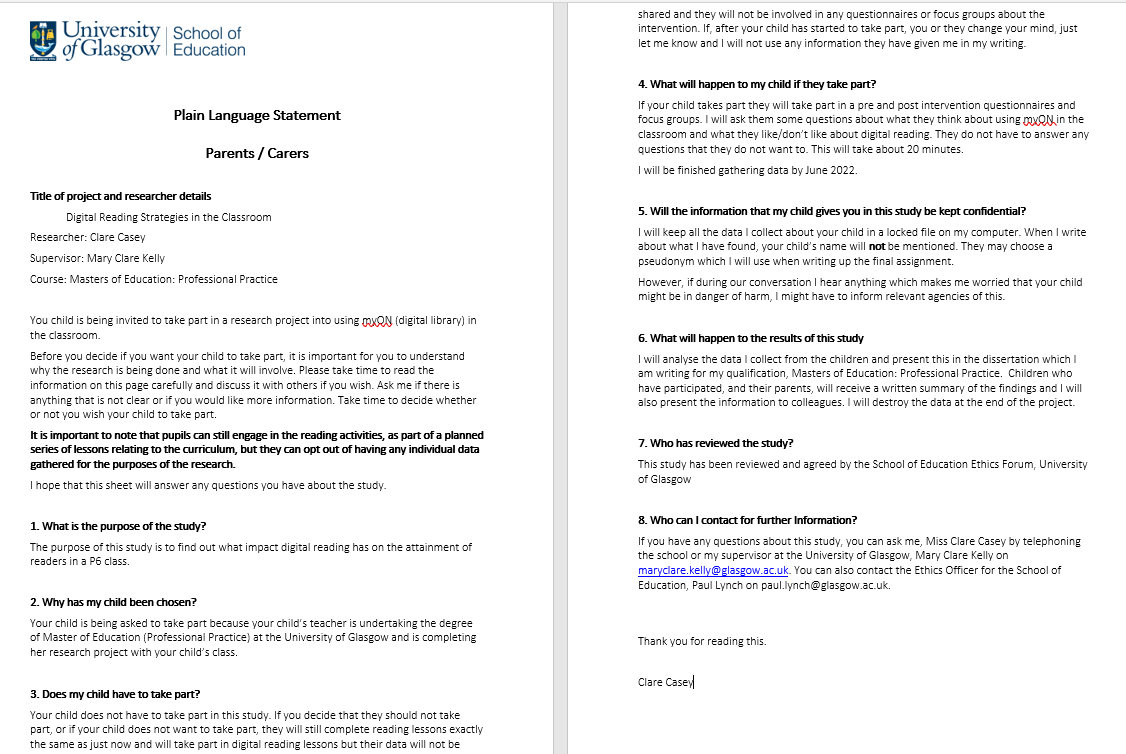
Appendix A- Methodology Search Strategy

|  |  |  |  |
| --- | --- | --- | --- |
| Database | University of Glasgow Library | | |
| Link to Database | https://glasgow.summon.serialssolutions.com/ | | |
| Initial Search Term(s) | Total Returns | Filters Applied | Total after Screening (Total Included in Literature Review) |
| Mixed Methods | 189, 750 | Discipline - ‘education’  Publication date – from 2000 onwards | 6 |
| Questionnaires | 281,882 | Discipline - ‘education’  Publication date – from 2000 onwards | 8 |
| Questionnaires AND education | 93,482 | Discipline - ‘education’  Publication date – from 2000 onwards | 5 |
| Focus Group | 54,102 | Discipline - ‘education’  Publication date – from 2000 onwards | 7 |
| Focus Group AND pupils | 33,829 | Discipline – ‘education’ | 5 |
| Pre- and post-test | 194,574 | Discipline - ‘education’  Publication date – from 2000 onwards | 9 |
| Pre-experimental design | 2,819 | Discipline - ‘education’  Publication date – from 2000 onwards | 3 |
| Citations |  |  | 22 |

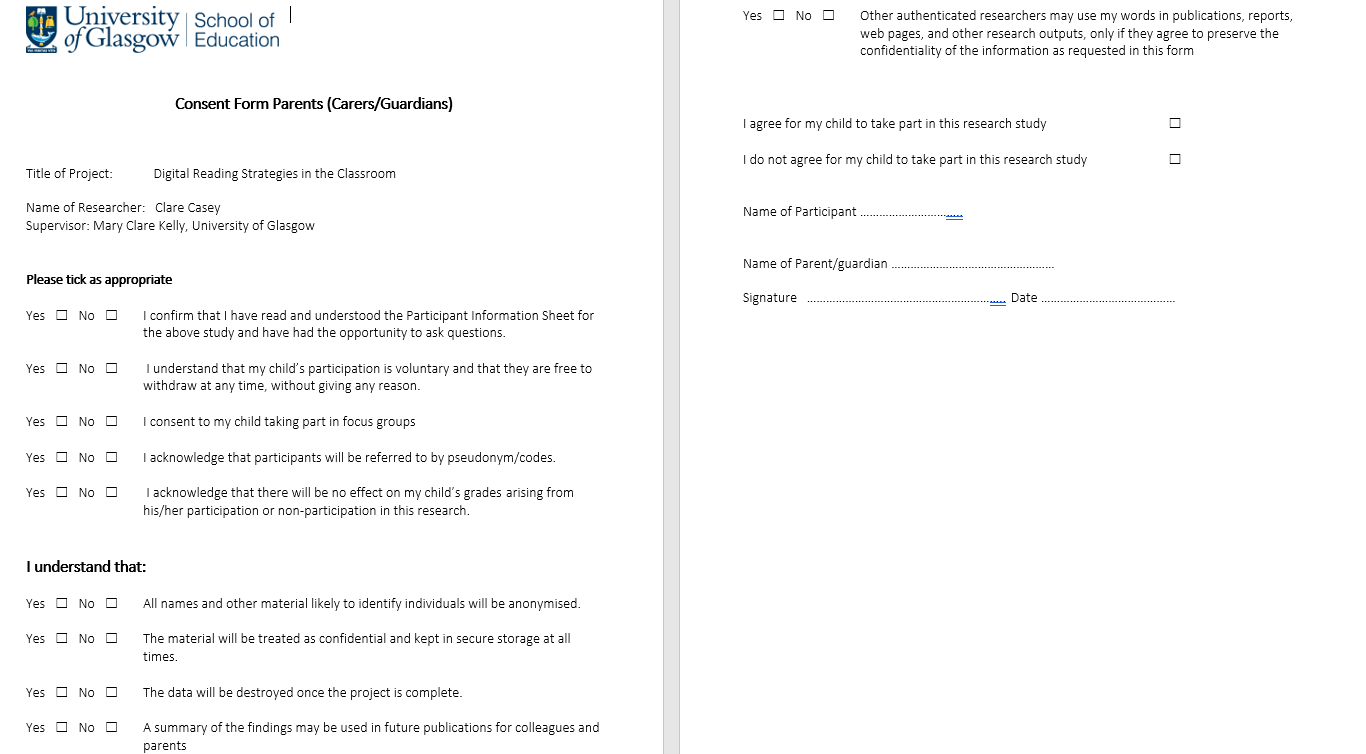
\*\*Excluding duplicates or literature that is not relevant to this research project.

Appendix B Ethical Approval

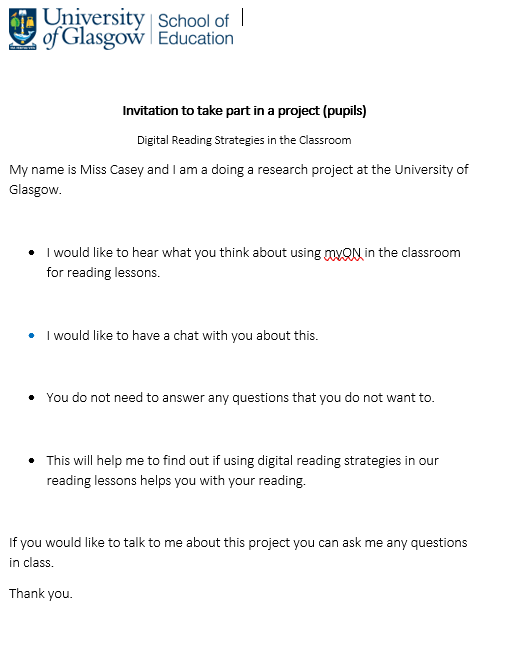
  
 Appendix C Parental Plain Language Statement



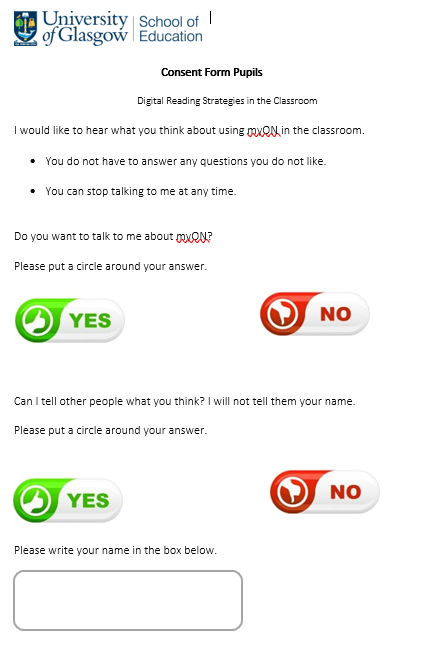
Appendix D Parental Consent Form



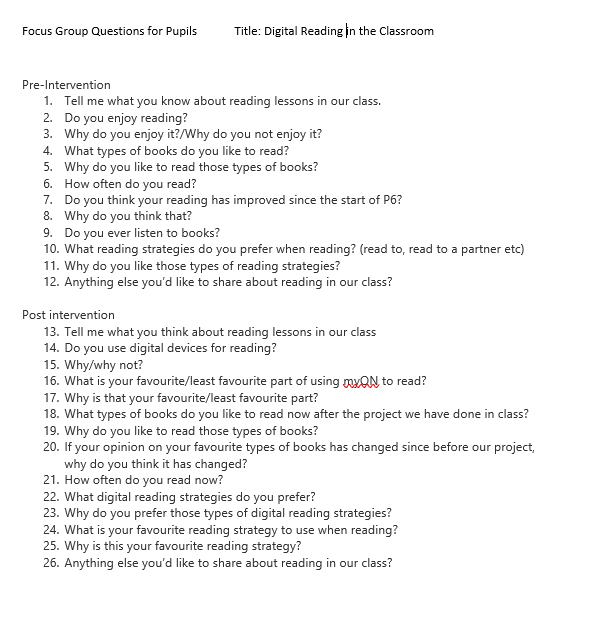
Appendix E Pupil Plain Language Statement



Appendix F Pupil Consent Form

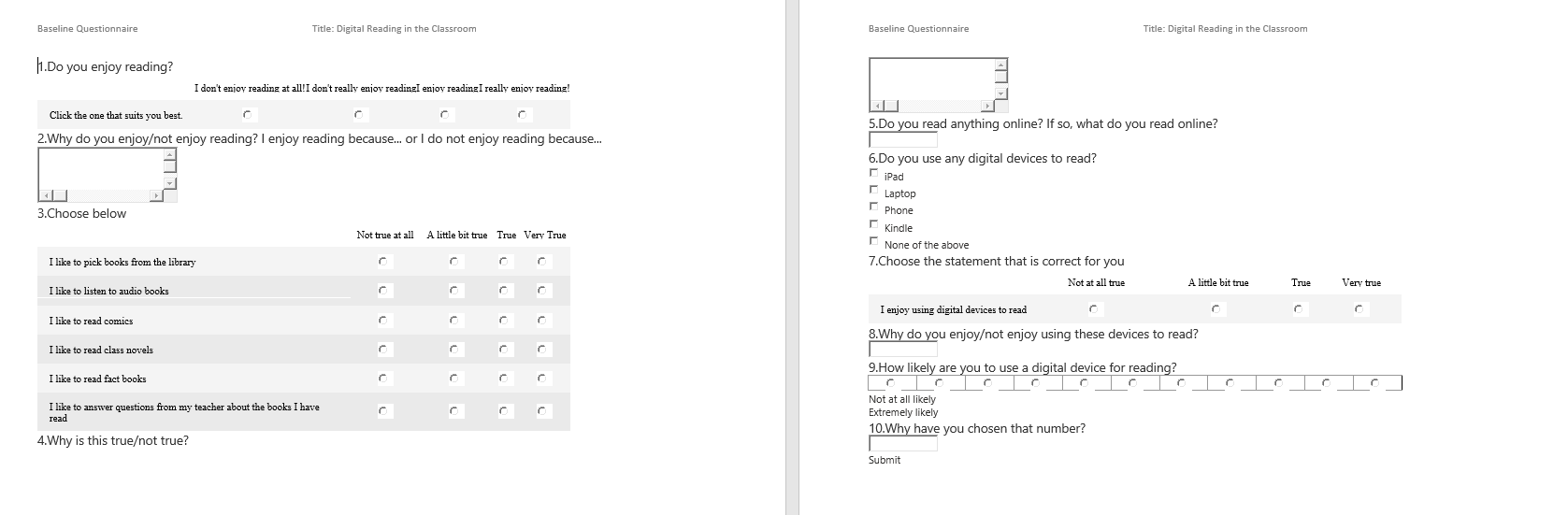


Appendix Focus Group Questions

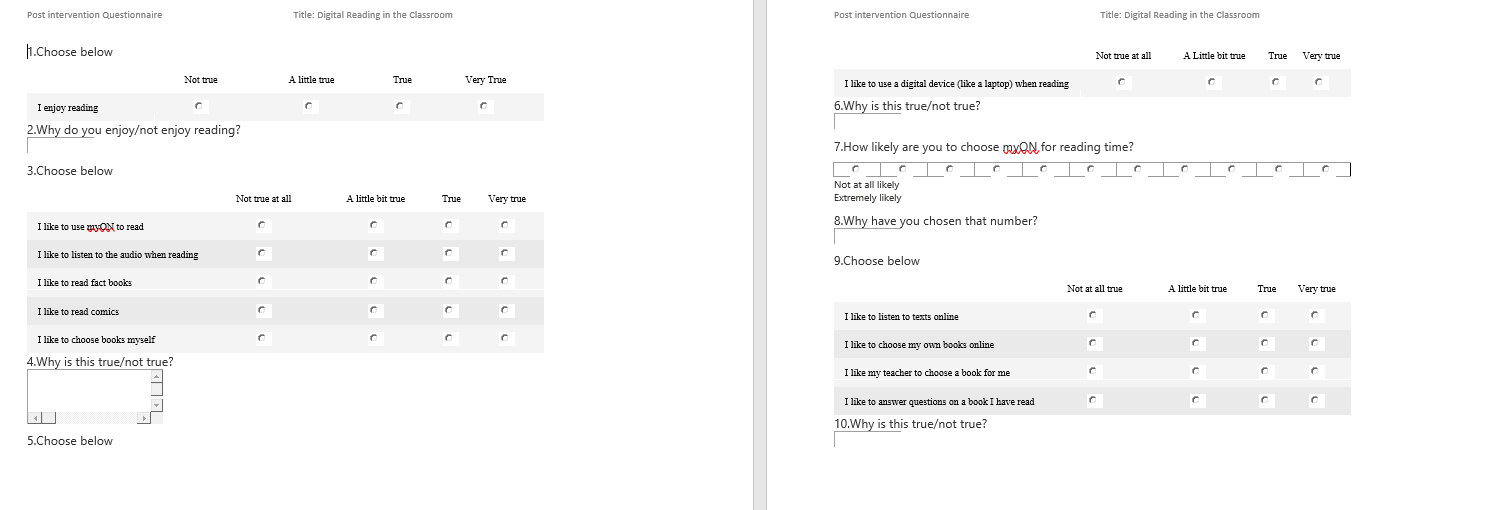


Appendix H Online Questionnaires

Pre- intervention



Post-intervention

  
 Appendix I- Non-Standard Human Data Ethics Form

