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Investigating the use of a digital diary for home-school communication between parents and teachers of children with additional needs

Dawn Lisa Hallett
Edith Cowan University

Edith Cowan University

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Dawn Lisa Hallett

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Dawn Hallett
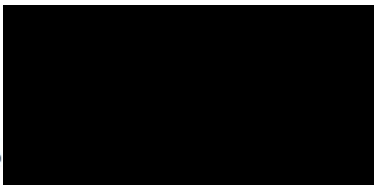
Abstract

The use of paper diaries to facilitate home-school communication for children with additional needs has shown to have numerous limitations. While the use of mobile digital devices has increased in schools, little research exists into the use of these devices for home-school communication purposes. This study explored the effects of using a digital diary to facilitate home-school communication for primary aged children with additional needs. A constructivist multiple case study approach was used. The digital diary utilised the software application Evernote. This free application was hosted on study participants' mobile devices or accessed over the Internet. Pre-innovation interviews and surveys were conducted with a group of parents (n=10) and teachers (n=8). The digital diary was trialled for eight weeks. Parents and teachers' experiences of the digital diary were investigated through post innovation interviews. The results showed an increase in situational awareness, collaboration, child involvement and parental engagement. Overall the study showed a range of potential advantages for using a digital diary to facilitate home-school communication for children with additional needs.

Dawn Hallett

Declaration

I certify that this thesis does not to the best of my knowledge and belief:

(i)   Incorporate without acknowledgement any material previously submitted for a degree or diploma or any other institution of higher education;

(ii)   Contain any material previously written by another person except where due reference is made in the text; or

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Signature   Date 6th November 2017

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Glossary

Additional Need (AN):

"The term 'additional needs' defines and categorises a range of conditions and circumstances that can result in children requiring specialist support" (National Childcare Accreditation Council, 2008). This study focuses on "children who have additional needs related to their learning and physical development and wellbeing. These may include children who have:

- A physical disability such as cerebral palsy, muscular dystrophy or amputation.
- An intellectual disability or developmental delay.
- Communication problems or disorders.
- A diagnosed condition such Autism Spectrum Disorder (ASD, Down Syndrome or Attention Deficit Hyperactivity Disorder (ADHD)" (National Childcare Accreditation Council, 2008).

Australian Curriculum Assessment and Reporting Authority (ACARA) – "The Assessment and Reporting Authority (ACARA) is an independent statutory authority that will improve the learning of all young Australians through world-class school curriculum, assessment and reporting" (Australian Curriculum Assessment and Reporting Authority, 2016).

Autism Spectrum Disorder (ASD) – "Autism spectrum disorder (ASD) is a lifelong developmental disability that affects, among other things, the way an individual relates to his or her environment and their interaction with other people" (Autism Spectrum Australia, n.d.).

Diary – A means of communication between home and school.

   Digital diary (DD) – An application hosted on a smart phone or tablet that

provides an electronic means of communication between home and school. The DD allows content to be stored digitally, which enables the sharing of data such as pictures, videos, voice recording and typed notes.

Paper diary (PD) – A paper book used to facilitate communication between home and school.

Digital Diary Innovation (DDI) – A trial period in which the DD is used instead of the paper diary for home-school communication.

Encryption – "The encoding of information so that it may not be intercepted and interpreted by unauthorised recipients" (Ryan & Frater, 2002, p. 3).

Evernote – Note taking application, which can be accessed on the web or through an application downloaded onto a computer, tablet or smartphone.

Evernote's three laws of data protection – Evernote's three principles used with data; the data belongs to the account holder, the data is protected and the data can be easily accessed and transferred (Libin, 2011).

Geotagging – The method of adding the geographical location to media, such as videos or photographs.

Home-school communication – The contact between parents and teachers. The communication may be initiated by either party and be in the form of written diary entries, verbal communication over a telephone, and/or verbal communication in person.

Individual Education Plan (IEP) – A plan that is written with individual goals in all areas of the curriculum to support the learning of a child with additional needs.

Information and Communication Technology (ICT) – Technology that enables access to information using telecommunications, such as the Internet.

iPad – Apple's Incorporated tablet (see *Tablet*).

iPhone – Apple's Incorporated smartphone (see *Smartphone*).

Mobile Digital Device – Any portable digital device that runs an operating system and supports multiple applications. Typically connects to the Internet through inbuilt WIFI hardware or cellular network hardware. Examples include laptops, tablets and smartphones (see respective definitions).

Multimedia – Digital images, movies or sound clips.

Parental engagement – Parents engaging with their child's learning at home.

Parents – Biological parents, carers or legal guardians of the child.

Professional Development – Training provided to teachers to develop skills and knowledge.

Smartphone – A mobile telephone that is handheld in size, uses a touch screen interface and connects to the Internet via WIFI or in built cellular hardware.

Smartphone apps – Applications downloaded from the Internet for use on a smartphone or tablet.

Special needs centres – Centres situated next to mainstream schools that cater for children with an intellectual and/or physical disability. The Centre is typically located

on the same premises as the mainstream school; however, it is often physically separated.

Special needs schools – Schools that cater specifically for children with an additional need.

Tablet – A mobile computer that is handheld in size, uses a touch screen interface and connects to the Internet via WIFI or in built cellular hardware. Common examples include the Apple iPad range, Samsung Galaxy range and Google Nexus range.

Voice-mail technology – A computerised system that allows the storing of messages if a person is unable to take a call.

Web browser – Software used for browsing the Internet.

CHAPTER ONE: INTRODUCTION

Rationale

The researcher's passion has always been to provide an engaging and accessible curriculum to all children, regardless of their background and ability. Although she trained as a mainstream teacher and spent nine years teaching in the field, more recently the researcher found her professional role in special education, working with children who have Additional Needs (AN). The move from mainstream to special education provided the researcher with an insight into the challenges faced by teachers and parents of children with AN, and the importance of establishing and maintaining effective two-way communication to ensure the best learning outcomes are achieved for children. Having experienced first-hand the challenges faced with home-school communication, the researcher felt there existed a more effective tool that could better support home-school communication and facilitate parental engagement in the child's learning.

In recent years, technology has played a more central role in classrooms, with a range of mobile digital devices, namely computers, laptops and tablets being used in educational contexts. Used effectively, these mobile digital devices have shown to improve learning outcomes for children (Cardon, 2012; Willis, Kestell, Grainger, & Missingham, 2013). Research on the integration of Information and Communication Technology (ICT), and more specifically on the use of mobile digital devices has shown that mobile tablet devices, if used skilfully by the teacher, can assist in overcoming many of the barriers posed by more traditional teaching and learning methods (Willis et al., 2013). One of the reasons for this, cited by Cardon (2012), is that children are motivated by using digital tablet devices as they are considered fun and they can present information to children in an alternative way to teachers or parents. Additionally, when they are permitted to use digital tablet devices in their learning, children can show their understanding using a variety of ways. Broader research into

the use of ICT to support home-school communication has included investigations into the use of voice mail, laptops and blogs (Cameron & Lee, 1997; Grant, 2011; Lewin & Luckin, 2010). The limited research conducted has demonstrated how ICT, and the use of mobile digital devices, have the potential to overcome previous communication barriers and offer an alternative option for home-school communication (Grant, 2011).

In more recent years, the researcher's role developed from being a teacher of children with AN to working alongside other teachers, helping them to integrate mobile digital tablet technology, further referred to as tablets, into teaching programs for children with AN. This role included facilitating professional development for teachers, planning alongside teachers, modelling lessons using tablets, working with individual needs in the classroom and facilitating information sessions for parents to provide them with knowledge and understanding of how these devices could support their children to achieve improved learning outcomes. It was exciting to observe the positive experiences each of these groups gained from using the device. Tablets are an effective tool to integrate into teaching and learning for these key reasons:

1. Tablets have a touch screen interface, which enables the user to control the device using their hands directly on the screen. There is no need for a keyboard or a mouse, which is particularly beneficial for people with poor fine motor skills.
2. Tablets have many high-quality applications that can be used to support a variety of teaching areas across a range of levels and needs.
3. Tablets last up to 10 hours without needing charging. Therefore, tablets can be used throughout the school day, without the worry of the battery going flat.
4. Tablets are lighter and smaller than laptops and desktop computers. Therefore, tablets can be carried around and accessed easily and at a time convenient to the user.
5. Tablets have built-in accessibility features, which makes it easy to modify the device to suit different learners. For example, the screen can be magnified or

have elements articulated, for people with low vision. Colours can be adjusted for people with colour blindness.

6. Using the Internet, tablets enable a range of information to be shared in multiple ways. As well as using text to record ideas, children can record their voices, use images or create videos to share the same information. Therefore, children can choose how they want to show their learning, rather than relying on traditional pencil and paper methods that have prevented them from showing their full potential (Cumming & Strnadova, 2012).

Context

Home-school communication is an essential part of every child's education (Australian Research Alliance for Children & Youth, 2012; Harris & Goodall, 2008; Heath, Maghrabi, & Carr, 2015; Zhang, Hsu, Kwok, Benz, & Bowman-Perrott, 2011). The importance of including carers in their child's education is also recognised as a key requirement in the Australian Professional Standards for Teachers (AITSL) (Australian Institute for Teaching and School Leadership, 2014). Home-school communication is a conversation that takes place between parents and teachers via different channels, based around the child's social and emotional wellbeing and learning. If home-school communication is operating effectively, it leads to the development of a collaborative partnership between the parent and teacher, which can be paramount in supporting the child in achieving the best possible learning outcomes (Beveridge, 2007; Ludicke & Kortman, 2012).   Home-school communication can pose many challenges for mainstream schools; however, for children with AN, home-school communication can be considerably more complex (Hall, Wolfe, & Bollig, 2003; Stanley, Beamish, & Bryer, 2005).

In Australia, children are classed as having an AN if, among other things, they have a physical or mental disability. These additional needs typically mean the child will require additional support to ensure they receive an education that is inclusive

and caters to their individual circumstances. Depending on the complexity of the AN, home-school communication can be difficult to achieve because of oral and aural communication skills, memory retention, or delayed emotional development (Hall et al., 2003). Consequently, many parents of children with AN often receive little or no information from the child about their school day (Australian Institute of Health and Welfare, 2008).

Home-school communication takes place via a variety of methods, including the telephone, email, reports and face-to-face interviews (Cameron & Lee, 1997; Kervin, 2005). An effective home-school communication system enables parents to receive updates on their child's progress and provides an opportunity for parents to become involved in their child's learning. A home-school communication system that facilitates parental engagement in their child's learning is important as research shows parental engagement in the child's learning impacts positively on a child's learning outcomes (Australian Research Alliance for Children & Youth, 2012; Harris & Goodall, 2008; Zhang et al., 2011). While limited research has been conducted on the impact of parental engagement on a child's learning outcomes with AN, the small amount of research carried out demonstrates it plays an essential role in a child's successful schooling (Floyd & Vernon-Dotson, 2009).

To support more frequent home-school communication for children with AN, schools may choose to use paper diaries (PDs) in addition to the communication methods previously shared (Beveridge, 2007; Burrows, 2004). PDs travel between home and school each day with the child, and teachers and parents are encouraged to use them to record any key events, learning outcomes and other relevant extracts of information about the child. A study conducted on the effectiveness of the PD showed that although the ideal of a PD can present a straightforward tool in which to communicate, difficulties were experienced by parents and teachers, which hindered effective communication between home and school for children with AN (Hall et al., 2003). The three key issues identified by Hall et al. (2003) were the different content

recorded by teachers and parents, the absence of parent responses and the irregularity in which communication occurred. These findings were consistent with the researcher's own experiences gained from working in schools. Although the research shows the limited success of PDs as a home-school communication tool, in the absence of an alternative, the PD continues to be used to support home-school communication throughout many schools for children with AN.

Problem

Research shows a collaborative approach between parents, teachers and children can result in improved outcomes for children (Beveridge, 2007; Ludicke & Kortman, 2012); however, many of the current communication methods are failing to support effective partnerships between home and school for children with AN, as a result of home-based or school-based difficulties (Hall et al., 2003; Stanley et al., 2005).

A key barrier to effective home-school communication is restricted time. This may be because both parents are working full-time and find it challenging to balance this with life at home with their children (Cameron & Lee, 1997). Time restrictions can also prevent parents meeting teachers at a convenient time (Harris & Goodall, 2008).

PDs used by schools rely on parents being able to access the information recorded; however, if parents are from a non-English speaking background or have poor literacy skills, PDs can be hard to access (Hansuvadha, 2009). PDs are also heavily reliant on the child remembering to take it between home and school and in some cases, they are lost or forgotten (Burrows, 2004). In some situations, teachers have reported communication only occurring one way, from school to home (Hughes & Greenhough, 2006), which could be because parents have been given little guidance on the expected use and content of the PD (Burrows, 2004).

Knowing the importance of parental engagement in determining a child's success, and acknowledging that current methods of communication are failing to facilitate home-school communication effectively, Emerson, Fear, Fox, and Sanders (2012) believe ongoing research and new methods must continue to be explored. As they state: "…resourcing and effectively progressing parental engagement initiatives is warranted, if not essential to, education reform and the future of Australia" (p. 3). Having experienced the success of mobile digital devices in a classroom context among children with a range of AN, their parents and teachers, showed their potential to the researcher for using these as alternative tools to support home-school communication.

Purpose

The purpose of this study was therefore to explore the use of a digital diary (DD) in supporting home-school communication for children with AN. A DD performs the same role as a PD; however, a DD is hosted on a mobile digital device and therefore, allows content to be stored digitally, enabling the sharing of a variety of data, such as pictures, videos, voice recording and typed notes. It was hoped this research would provide evidence on how communication could be improved using DDs, as well as providing a practical structure for other schools to adopt after the trial concluded. Therefore, the aims of this research were to:

- Investigate what parents and teachers of children with AN want from home-school communication.
- Investigate if and how communication changes with the introduction of DDs for parents and teachers of children with AN.

Importance

The research conducted aimed to find out what parents and teachers of children with AN wanted from home-school communication and if DDs could provide a more effective and efficient way to communicate than PDs. An exploration of alternative methods of communication was undertaken to improve current communication levels between home and school, build stronger partnership between parents, teachers and the students and encourage deeper levels of parental involvement in their child's learning at home.

This research offers insight into the potential of the DD in providing a more comprehensive and holistic communication system than current methods being employed by schools, by using the accessible and multimodal features offered through a DD. The researcher wanted to investigate if the accessibility features of the DD could provide a more convenient tool that encouraged more regular sharing of information between parents and teachers. This research also set out to find out if the multimedia aspect of the DD could provide the means to share more detailed and personalised information about the child. The researcher wanted to know if photographs could provide more information and be more accessible than reading a paragraph of words and if the use of visuals could provide greater meaning to a parent. Digital solutions have a range of affordances, which could be beneficial to support home-school communication. This research aimed to explore if these affordances, for example the ability to include videos, could be used to demonstrate teaching strategies being used at school that could then be watched and repeated at home. The researcher wanted to see if this would enable parents to learn more appropriate ways to support their child and become involved in the learning process. The researcher also wanted to see if this alternative form of communicating could help include parents who have previously been regarded as difficult to reach; for example, parents with low reading and writing skills, parents with English as an additional language or parents with disabilities, such as low vision.

Additionally, the researcher wanted to find out if communicating through a DD could encourage the involvement of children in the communication process, as many children are more motivated by the use of technology. This could particularly benefit children with AN, as there would be options to send and receive information, including voice recordings, images and videos, rather than the reliance on reading and writing that is needed to participate in communication using the PD.

Finally, this research could provide a practical solution that any school, both special and mainstream, could adopt. Using recommendations suggested and being aware of the difficulties experienced during this innovation, schools would have a place in which to start from when developing their own digital communication system.

CHAPTER TWO: LITERATURE REVIEW

The literature review is structured into five main areas to provide an overview of the context and the problem being investigated. As Bell (2010) asserts: "a review should provide the reader with a picture, albeit limited in a short project, of the state of knowledge and of major questions in the subject" (p. 104). Initially, the literature reviewed will examine the current provision for children with AN in Australia. Secondly, the literature will be used to explain the challenges faced by: children with AN and their parents, as well as their teachers. Thirdly, literature on the importance of parental involvement and parental engagement will be explored. Fourthly, the literature on the role of home-school communication will be discussed. Finally, the literature will detail the role of technology in effective communication.

Provision for Children with an Additional Need

In education, a key aim of the United Nations (n.d.) is that: "Persons with disabilities can access an inclusive, quality and free primary education and secondary education on an equal basis with others in the communities in which they live" [Article 24, Section 2b]. In Australia, at the Federal level, the Disability Discrimination Act of 1992 exists as a guide when considering children with AN in schools; however, the information contained in the Act focuses on overarching guidelines rather than providing specific direction to the States and Territories. This section will review the provision for children with AN across the States and Territories of Australia.

Changing approach

In 2009, the Australian Bureau of Statistics (2013) reported approximately 292,600 of school-age children as having AN, ranging from mild to severe. Of the statistics collected, one in 10 children with AN were found to be boys and one in 16 were girls. The Australian approach towards education for children with AN has always mirrored those of the United Kingdom and America (Szaday, Pickering, &

Duerdoth, 1989).   During the 1900s, it was common practice for children with AN to be educated separately to their mainstream peers (Snow cited in Graham, Sweller, & Van Bergen, 2010); however, in the 1960s, Lovaas (cited in Brigg, 2008) demonstrated how children with Autism Spectrum Disorder [ASD] had the capacity to learn, when provided with the appropriate tasks and structure. This initiated a change in attitude towards children with AN and their capacity for learning.

In the mid 1970s, Australia started to integrate children with AN into mainstream settings. This was supported by the Disability Discrimination Act, which came into effect in Australia in 1992 (Organisation for Economic Co-operation and Development [OECD], 1999). The Act focused on providing all children with the same opportunities, regardless of their ability. After the passing of this Act, expectations for the provision of children with an AN were raised and more emphasis was placed on the integration of children with AN into mainstream schools, with extra support. This idea spread in popularity globally (Organisation for Economic Co-operation and Development [OECD], 1999).

In May 2008, the United Nations released the Rights of Persons with Disabilities (cited in the United Nations, n.d.). The purpose of this convention was to ensure all children with AN were provided with an education that was equivalent to that of a mainstream peer, and was inclusive, of good quality and free. Although there are mixed views about what inclusivity actually means, most agree it is the inclusion of all children in the same class, regardless of background or ability, as far as possible (Dickson, 2012; Elkins, van Kraayenoord, & Jobling, 2003). Many children with AN are now learning alongside their mainstream peers rather than being taught separately (Dickson, 2012).

Schooling options

Across the States and Territories of Australia, the education system is split into three sectors; Catholic, Independent and Government, and in each sector, policies are

managed and executed at the State/Territory level. Currently there is no nationwide approach towards the management of children with AN and as such, there are differences in the level of schooling each child with a AN receives (Australian Research Alliance for Children & Youth, 2012). As the States and Territories have differing interpretations of AN, a child could be classed as having an AN in one State but not in another State. From these findings, there have been recommendations for the Ministerial Council for Education, Early Childhood Development and Youth Affairs (MCEETYA) to develop a standardised definition of AN that could be used consistently across the States and Territories (Australian Government, 2003). When it comes to initial assessments, funding and provision for children with AN, there are again differences within and between States and Territories, as well as differences between the education sectors (Government, Catholic and Independent). Without a nationwide approach towards the management of children with AN, it is difficult to know if current provision offered across the States and Territories of Australia is enabling children with AN to succeed in their schooling (Australian Research Alliance for Children & Youth, 2012).

Additionally, assessment procedures for a child with an AN are inconsistent across the States and Territories. As an example, in the Northern Territory (NT), South Australia (SA) and Tasmania (TAS), a child needs to undergo an assessment before having access to extra provisions; however, the parents are then invited to work with the school to decide which setting would suit their child, regardless of the outcomes of the assessment (Department for Education and Child Development, 2014; Department of Education, 2016, 2017). In other States and Territories, parents are not consulted during the assessment process.

Throughout the States and Territories, after a child is assessed as having an AN, there are three options of schooling available to the child:

1. Mainstream, where children with AN are taught alongside their mainstream peers.
2. A special unit within a mainstream school, where children with AN are taught altogether for most the school day.
3. A separate special school, where children with AN are taught in a school exclusively for children with AN.

In most States and Territories, the outcomes of the assessment determine the options of schooling available to the child.

For children with AN who continue their education at a mainstream school, many States have provisions in place to support the teacher with providing an accessible curriculum. This is currently the case in ACT, NSW and NT (ACT Government, 2017; Northern Territory Government Department of Education, 2016; NSW Department of Family and Community Services, 2015). Some States also offer extra programs to support the inclusion of children with AN; for example, NT offer Special Education online training to all teaching staff (Northern Territory Government Department of Education Special Education and Disability, 2017). Victoria has recently started a new program for children with AN, providing extra funding to support schools who have children with AN (State Government of Victoria, 2017). The funding can be used to further develop teachers through in-house or external professional development, facilitate visits to other schools or enable the purchase of resources for use with children. Programs like these can help build staff capacity in their ability to develop an accessible and engaging curriculum for children with AN.

There are mixed feelings towards children with AN attending mainstream school from the different parties involved, including teachers, parents and the community. Although many mainstream teachers are open to the idea, often they do not have the specialised knowledge required to help children succeed (Brigg, 2008; Graham et al., 2010). In addition to this, Brigg (2008) claims that as children grow

older, the social gap between children with AN and their mainstream peers widens. In a study carried out by Elkins, van Kraayenoord and Jobling's (2003), many parents were happy for their children to be educated at a mainstream school; however, others were anxious their child's needs were not being met. As Graham (2010) highlights, having these children in mainstream school does not guarantee they are receiving a quality education. The Senate Employment, Workplace Relations and Education References Committee (2002) emphasises the importance of providing a range of options for schooling to ensure children can attend a setting that suits their needs best.

While most of the States have responded to the Disability Discrimination Act and introduced further policies to guide schools with appropriate provision for children with AN, Berlach and Chambers (2010) argue that policies on their own will be ineffective in changing the outcomes for these children. This is because schools need practical strategies to ensure policies are embedded within school practice. Although some States have taken further steps in providing extra practical resources for schools, without a shared vision of an accessible curriculum for all diverse learners, and consistency between States and Territories, many children with AN will be without the necessary provision to learn effectively.

The Australian curriculum

The Australian Curriculum Assessment and Reporting Authority (ACARA) manages key programs, which shape the Australian education system. ACARA has developed a national Australian curriculum that schools across the States were expected to have implemented by the end of 2014. Although ACARA state:

> Students with disability are entitled to rigorous, relevant and engaging learning
> opportunities drawn from age equivalent Australian Curriculum content on the
> same basis as students without disability, of the seven general capabilities
> developed, so far only three have been extended to accommodate extra levels

for children with disabilities (Australian Curriculum Assessment and Reporting Authority, 2016)

Berlach and Chambers (2010) point out: "ACARA have not addressed inclusivity in a comprehensive fashion" (p. 60). That the adaptations have been made as a result of comments from the general public is cause for further concern. Therefore, although there is some evidence to suggest inclusivity has been considered during the establishment of a new national curriculum, there is still much work to do in this area to ensure the curriculum is applicable and relevant to all children.

Challenges for Children with an Additional Need

A child with an AN attending a mainstream school can be confronted with challenges and concerns for themselves, their parents and teachers. To ensure a child with an AN is integrated successfully into a mainstream school setting, and to ensure that all parties concerned share a positive experience, it is essential that schools have developed clear procedures. It is also important that parents and teachers work collaboratively using shared skills and experiences during the child's schooling (Johnsen & Bele, 2012; Soto-Chodiman, Pooley, Cohen, & Taylor, 2012). The following section will discuss the challenges faced by children with an AN, along with their teachers and parents.

Challenges faced by children

Regardless of whether a child with AN attends a mainstream or special school, some children have characteristics that make them appear different to their mainstream peers, either physically or mentally; for example, children with ASD exhibit, "hand flapping and twisting" (Soto-Chodiman, Pooley, Cohen & Taylor, 2012, p. 98). Many also have, "varying levels of AN and/or psychopathology" (American Psychiatric Association cited in Soto-Chodiman et al., 2012, p. 98). This can result in:

- Developmental delay;
- Delayed or non-existent communication skills; and/or
- Under-developed social skills (Soto-Chodiman et al., 2012).

In a mainstream setting, a child with AN is likely to experience embarrassment, as they are being treated differently to other children (Ferri, Keefe, & Gregg, 2001). This is because they learn at a slower rate and often a lower learning level than their peers. Furthermore, many mainstream schools hold special classes for children with an AN that are situated in classrooms away from their mainstream peers.

In addition to these academic related differences, children with AN may struggle to develop and foster positive relationships with their mainstream peers because of their underdeveloped social and communication skills. These academic and social challenges can contribute to a feeling of isolation within an educational setting (Soto-Chodiman et al., 2012).

Taub (2006) suggests that many children may not have encountered a child with an AN and often do not know how to react or respond to them. To assist with this, Weasmer and Woods (2010) claims children should be taught how to interact with others who are different to them, suggesting many mainstream children will engage with children with an AN if they are provided with strategies to use. This was found to be true in a study carried out by Sparling (2002), where 82% of the children also agreed they would work with a child with an AN if asked. Although it is natural for parents and teachers to try and protect children with AN, it is essential these children are taught the fundamental skills and experiences to help them socialise with their peers, as this will give them a better chance of integrating into mainstream society.

Challenges faced by teachers of children

Teachers working with children with AN need to overcome different challenges to ensure these children are provided with an engaging and accessible curriculum. In a special education setting, a class of children with AN presents a group of widely diverse learners, each with their individual needs (Busch, 2001). Many of these children require one to one teaching as they have very different needs to the rest of the class. Unfortunately, in many situations this is not practical, and these children are frequently grouped with other children who have different levels and needs (Busch, 2001). Similarly, in a mainstream setting, a child with AN may be placed in a group of varying abilities without any additional support. Differentiating the curriculum to make it accessible for children with AN can present challenges; however, Weasmer and Woods (2010) argue striving to meet the needs of all children encourages teachers to develop their teaching methods as they seek new and effective ways of delivering content to children.

Lowered expectations: As many children with AN achieve lower grades than an average child; a common attitude is to lower expectations, or even to remove them completely. As Taub (2006) states: "teachers may focus on what the child cannot do to the exclusion of what the child can do" (p. 55). These lower expectations were experienced by two teachers in a study carried out by Ferri, Keefe and Greg (2001), in which current teachers of children with AN, who have AN themselves, formed part of a research project. Lowering expectations can have negative effects on the child, including the demotivation of children (Busch, 2001). In the study conducted by Ferri, Keefe and Gregg, one teacher highlighted the need for expectations and the importance of learning, regardless of their disability. Another teacher stated:

> I don't want [my children] to go through what I went through-the frustration. And I don't want them to have teachers that have low expectations of them. I

want them to have someone that really knows that they can succeed if they have the right tools (2001, p. 8).

Keeping expectations high, with appropriate support, helps children to understand the value of their education, keeps the learning momentum going and provides the child with opportunities to experience success.

Time and emotional impact: Some challenges experienced by teachers of children with AN are particularly prevalent in mainstream settings. A study carried out by Soto-Chodiman et al (2012) found: "the experience of having a student with ASD within their mainstream class presented them with a number of time-consuming and sometimes draining challenges" (p. 102). These challenges often exist because many mainstream teachers are not equipped with the skills and strategies to effectively manage children with AN (Brigg, 2008). Including children with AN requires an adapted curriculum, a well-developed individual behaviour management plan, as well as extra training and support for the teacher. The extra work required for this to be successful can often result in a teacher's reluctance to teach children with AN (Soto-Chodiman et al., 2012).

Concerns experienced by parents

As children with AN start school, parents have many concerns in addition to the common concerns experienced by all parents. These include the:

- Child building and maintaining relationships with their peers.
- Child suffering bullying at the hands of their mainstream peers.
- Teacher focusing on what the child cannot do, rather than what they can do.
- Parents, building and maintaining relationships with the key people at school, particularly when moving schools (Taub, 2006).

As Piškur et al. (2016) state:

Parents of a child with a disability play a crucial role in the development of their child. However, providing care and supporting a child with a disability furnish more intensive care that requires a significantly larger amount of time, greater financial stress, more frequent disruption of family routine and reduced social activities outside the family (pp. 803-804).

As parents play such an important role in a child with AN's progress, it is essential that schools are aware of the challenges and concerns and have strategies to address these so children can gain the best support from home and school.

Perception of child: When children with AN attend school, it is common for parents to worry about how their child is perceived by both other children and teachers (Heward, 2003). Parents worry their child will have difficulties building and maintaining relationships with their peers (Taub, 2006). They are also worried these differences may lead to bullying (Piškur et al., 2016; Tobias, 2009). These perceptions are often formed based on the school's approach to children with AN (Sparling, 2002). Therefore, it is important for a school to develop and apply polices around the education and treatment of children with AN, which is transparent for parents, staff and children. In addition to worrying about the opinions of the child's peers, parents of children with AN are often anxious about experiencing negative reactions from their surrounding community (Piškur et al., 2016).

Parents of children with AN also worry about how their child perceives themselves, as well as how they may be perceived by others (Missiuna, Moll, Law, King, & King, 2005). A parent in one study carried out by Missiuna et al. (2005), found that the child was so self-conscious about their differences that they refused to attend any school activities outside of the classroom. In the same study, parents were also worried about their child's academic levels impacting on their confidence, as one parent shared: "she was starting to think of herself as not very smart because she

wasn't producing at the same rate as her classmates. And that was another red flag to me" (Missiuna et al., 2005).

Additionally, parents worry about how they themselves are perceived. Parents of children with AN are often anxious that other parents and teachers may treat them differently. However, these parents have the same wishes as most other parents; to feel welcome at the school (Tobias, 2009), and to be a valued participant in their child's learning.

Recognition of child's abilities: Another concern parents have is that the teacher may be too focused on what the child cannot do rather than looking at what the child can do. As Taub (2006) explains:

> Perhaps the teacher will focus on the child's 'label' and not see the learner. Maybe the teacher will see the student's struggles with maths but miss his or her gift for art. Perhaps the teacher will be unable to see past the wheelchair to the bright and eager young person using it (p. 55).

Appropriate support: Parsons, Lewis and Ellins (2009) found the overriding wish of parents of children with AN is that their child is being understood and their needs are being catered for. This was a shared view from parents of children with a range of AN and was also found by Whitaker (2007).

Transitions: Transitioning between classes or schools can seem a daunting prospect for any parent; however, for a parent of a child with AN, this can be a highly stressful time (Parsons et al., 2009). Positive relationships between the parents, teachers and child are crucial to the child's emotional and academic development (Epstein, 1995), and these can take time to develop (Taub, 2006). In addition to this, the teacher of a child with AN needs to develop a good understanding of the child to teach them effectively. For children with AN, information should be distributed to teachers and to

relevant professionals also involved in the child's education (Ludicke & Kortman, 2012; Welchons & McIntyre, 2015). In one study, parents felt separate agencies were not sharing enough information about their child (Janus, Kopechanski, Cameron, & Hughes, 2008). Key information about the child can be lost during the transition process, which can be extremely frustrating for the parent. Therefore, an effective communication system is crucial for facilitating the handover of information during transition time (Fowler, Schwartz, & Atwater, 1991; Janus et al., 2008; Parsons et al., 2009). Extra support should also be provided to support children and their families during the crucial transition times (Parsons et al., 2009).

Communication system: In addition to the challenges described above, keeping parents of children with AN fully informed can often be more challenging than with parents of mainstream children, as many of these children are either non-verbal or have under-developed communication skills. This impacts on the amount of information received by the parent, as in many cases, the child is not able to tell the parent what happened during the day, and for other children who are verbal, they may not remember (Delaherche et al., 2013). In a study carried out by Busch (2001), many of these parents did not attend the Individual Education Plan [IEP] meetings or respond to requests sent home. Therefore, teachers of children with AN may need to consider alternative approaches to establish communication between home and school.

An effective home-school communication system is crucial to ensuring parents' concerns are alleviated regularly, they can share in their child's day and can be actively involved in their child's learning. As Johnsen and Bele (2012) assert:

> For children who need extra support and help in their education, a relationship between parents and school in an effective two-way communication will be a basic supporting factor for the children's learning achievements, and particularly important for children who experience problems in school (p. 11).

At a basic level, parents need to know what strategies are being implemented at school so these can be repeated at home. If a pictorial sign is being used to show "toilet" at school, the same sign should be used at home to ensure consistency between home and school, thereby reducing confusion for the child. Parents of children with AN also need to know if their child has had a particularly bad experience during their school day, as this may account for different behaviour during the evening. And like children without AN, parents need to know what their child has been learning so these concepts can be reinforced at home.

Parental Involvement

This section will look briefly at the history of parental involvement in the US, UK and within Australia. The term parental involvement will be defined and the ways in which parents can be involved will be explored. Epstein's (1995) overlapping spheres of influence will be discussed and finally, ways in which parents can engage with their child's learning will be examined.

Global history

Parental involvement is an important part of a child's schooling (Epstein,1995); however, teachers and parents share differing views on what parental involvement is (Todd, 2003). In addition to this, many schools have yet to find the perfect solution to an effective home-school communication system (Cucchiara & Horvat, 2009; Elbaum, 2014; Horvat, Curci, & Partlow, 2010).

In the 1980s, while new policies around parental involvement were being developed in the USA and the UK, Australia's focus was on discipline problems in schools (Ludicke & Kortman, 2012). In 2000, the Centre for Independent Studies published an article about the link between parental involvement and learning

outcomes for children (Rich 2000). At this time, teaching organisations and parents had been asking for assistance regarding home involvement (Macgregor, 2005).

In 2001, "*No Child Left Behind*" was introduced in the United States. The fundamental idea of this publication was that parents should be taking a key role in their child's education. Following this, it became compulsory for parents of children with AN, and with an IEP, to be involved in their child's education (U.S. Department of Education, 2007). In September 2003, "*Every Child Matters*" was introduced in the United Kingdom. The aim of this publication was to strengthen the relationship between home and school (Chief Secretary to the Treasury, 2003). Since then, reviews of literature conducted by Harris and Goodall (2008) found that methods used to increase parent involvement were described as, "patchy, anecdotal and based on self-report" (p. 32).

Australian history

In 2004, a National Family School Partnerships Framework was developed and the outcomes of this were supported across all States and Territories (Australian Research Alliance for Children & Youth, 2012). Then in 2008, the Family-School and Community Partnerships Bureau was formed. Its main role was to provide assistance to parents and teachers, as well as share research outcomes from various studies being carried out about parental involvement. In 2012, a paper was released sharing research about parental engagement, which included practical strategies for schools to adopt (Australian Research Alliance for Children & Youth, 2012). Two key conclusions made by the Family-School and Community Partnerships Bureau were: "positive parental engagement in learning improves academic achievement, wellbeing and productivity", and that "resourcing and effectively progressing parental engagement initiatives is warranted, if not essential to, education reform and the future of Australia" (Australian Research Alliance for Children & Youth, 2012, p. 3). The Australian Research Alliance for Children and Youth (ARACY) are currently leading the Parent Engagement Project, which hopes to '…develop and promote a shared

understanding of what parent engagement is and why it matters, to encourage a consistent and ongoing approach to the measurement of its impact, and to build and share evidence about 'what works'' (Australian Research Alliance for Children & Youth, 2017). The outcomes from this project will be provided to the Australian Government Department of Education and Training. Communication between home and school still varies greatly from one school to another, as there is no clear policy set by any educational State department in Australia.

Parental involvement

Researchers have different meanings for the term parental involvement, and this term is used interchangeably with 'parental engagement', and sometimes 'parental participation'. This has made research outcomes unclear regarding the impact of parental involvement on student outcomes (Australian Research Alliance for Children & Youth, 2012). So what exactly is parental involvement? As Harris and Goodall (2008) explain:

> Involvement with the school may be characterised by responding to phone calls, attendance at parent's evenings or meetings, responding to reply slips or questionnaires, signing student diaries, membership of parent teacher associations or governing bodies, as well as physical presence in the school as either employee or volunteer (p. 38).

Establishing effective communication between teachers and parents is one of the six ways Epstein (2002) recommends schools should seek to improve parental involvement as follows:

- "Type 1: Parenting;
- Type 2: Communicating;
- Type 3: Volunteering;
- Type 4: Learning at home;

- Type 5: Decision Making; and
- Type 6: Collaborating with Community" (Epstein,1995).

Epstein's research has shown the importance of parental involvement in a child's development. The six ways of involving parents recognises the need for a shared school focus that involves schools, parents and the community, to help children achieve their full potential. The overlapping spheres of influence, developed by Epstein (1995) in Figure 1, recognises the three main participants that enable a child to learn and progress- the school, the child's family and the surrounding community. It is when these three groups work collaboratively that the child is better supported to achieve their potential.
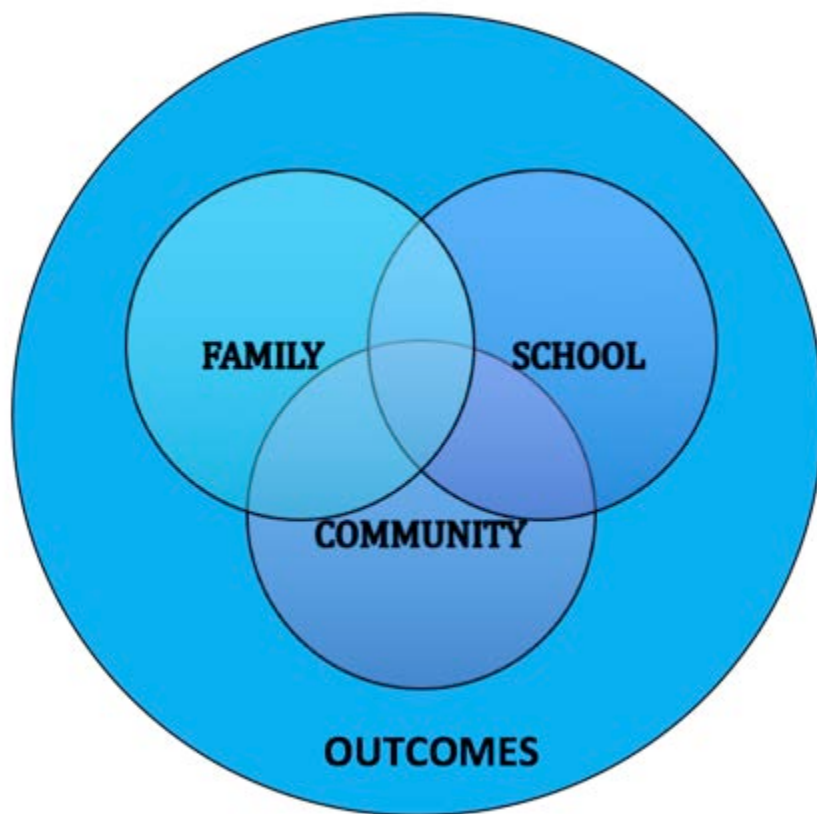
Figure 2.1: Epstein's overlapping spheres of influence model (1995).

Although the six areas described above help to involve parents in their child's schooling, research shows it is the parent's engagement in their child's learning at home that impacts significantly on the child's outcomes, rather than the parents' involvement in activities at school (Harris & Goodall, 2008; Zhang et al., 2011). As stated by Harris and Goodall (2008): "parental engagement is not about engaging with the school but with the learning of the child" (p. 37). For the purpose of this study, parental involvement refers to any involvement in a child's schooling; however, parental engagement will be referred to when parents are actually engaging with the child's learning at home. Parental engagement has shown to have a positive impact on student outcomes and it could be argued that parental engagement is even more essential for children with AN.

Parental engagement

Research going back at least 40 years shows a strong link between parental engagement in a child's learning at home and positive outcomes achieved by the child (Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford & Taggart, 2008). As Australian Research Alliance for Children & Youth (2012) quantifies: "specifically, it has been suggested that the relative influence of the home on student achievement is 60-80 per cent, while the school accounts for 20-40 per cent" (p. 7). Emerson et al. (2012) discuss the ways in which parents can engage in their child's learning and impact positively on their learning outcomes as *Academic socialisation*. These highlight six ways in which parents can engage in their child's learning at home:

- Sharing their expectations for learning.
- Revisiting learning strategies.
- Making connections between schoolwork and everyday life.
- Instilling high expectations for the future.
- Creating a motivating home to continue learning.
- Providing tasks that develop problem solving skills and independence (Australian Research Alliance for Children & Youth, 2012, p. 9).

Daily discussions about the school day: Several of the academic socialisation aspects shared above can be achieved through daily discussions parents hold with the child at the end of each school day. Research shows many parents do not feel they can influence their child's learning; however, Emerson et al. (2012) claim that evidence finds these opinions contrast findings from recent research. They stress: "it is important for teachers and other 'parent-facing' staff to consistently communicate to parents the importance of daily discussions about what their children are learning and their own expectations and aspirations for them" (p. 38). Additionally, reflecting upon the day's learning would help to reinforce any new ideas, give children a chance to ask questions and provide opportunities to extend learning beyond the current idea. Zhang (2011) also found parents discussing the school day with their child was found to be one of two ways in which parental engagement had a large impact on learning outcomes for the child.

Revisiting learning strategies: Another way Emerson et al. (2012) believe parents can engage in their child's learning is through asking teachers to send home an overview of learning from the day, along with strategies used, so parents can reinforce these new skills at home using the same methods (Cameron & Lee, 1997). This support could particularly benefit those children with AN, who often need extra time to process new learning.

Support with self-organisation: In addition to the ideas discussed by Emerson et al. (2012); Beveridge (2007) claims that parents could also support their child in becoming more organised in preparation for each school day, as she suggests: "children do better personally, socially and academically where they are encouraged to take responsibility for their own learning" (p. 4).

Connections between home and school learning: Cameron and Lee (1997) claim teachers are more equipped to educate children when they have a more thorough

understanding of a child's background and experiences. If teachers have more information about the child's home life, they can use this to inform their teaching" (Cameron & Lee, 1997). As Grant (2011) suggests: "Children do not leave their out-of-school lives behind them when they enter school, but bring with them the values, skills, knowledge and interests from their homes and communities" (p. 292). Learning about concepts in relation to the child's own interests can be extremely motivating, as demonstrated in the study carried out by Hughes and Greenhough (2006), where children were asked to bring in a shoe box with items of their own that fitted set criteria. The schools that took part in the research included schools with a high percentage of free school meals and schools with a low percentage of free school meals (LFM). As shared by Hughes and Greenhough (2006): "the teacher at the Bristol LFM School was struck by the impact of the shoe boxes on the children's creative writing. She talked about several children having 'literacy breakthroughs' as a result of this work" (p. 481). Teaching built upon prior learning enables children to make clearer links between current and new knowledge.

With the knowledge that parental engagement in their child's learning at home has a significant impact on a child's learning outcomes, it is imperative that schools adopt an effective communication system that facilitates ongoing learning for the child at home.

Home-school Communication

This section will explain why home-school communication is important, particularly for children with AN. The different methods of communication will be looked at, as well as the different contributors to the communication process. Other key aspects about home-school communication will be shared and the barriers to home-school communication will be examined.

Background

At the start of a student's schooling career, it is common for parents to take children to school and hold informal conversations with the teacher at the beginning and end of each day. However, as children grow older and become more independent, this daily interaction between parents and teachers diminishes and for some parents, they may only have contact with teachers once or twice a year (Emerson et al., 2012). For children with AN, continued communication remains important throughout schooling as care is extended beyond curriculum learning for many of these children. However, finding a communication method that is manageable and meets the needs of parents, teachers and the child can prove challenging (Zhang et al., 2011).

Importance of home-school communication

Parental engagement in a child's learning results in improved learning outcomes for children (Australian Research Alliance for Children & Youth, 2012; Melhuish et al., 2008; Zhang et al., 2011). Emerson et al. (2012) explain: "Parents play a critical role in providing learning opportunities at home and in linking what children learn at school with what happens elsewhere" (p. 7). This is even more important for children with AN, as Floyd and Vernon-Dotson (2009) claim: "it is often an essential ingredient in a child's success" (p. 160). Little research has been carried out focusing on the impact of parental involvement on children's learning outcomes in special education (Zhang et al., 2011). However, it is clear that parents discussing the school day, revisiting learning strategies, supporting their child with self-organisation and helping to make connections between home and school learning can be beneficial for these children. Additionally, research has shown that parents of children with AN need the reassurance that their child is happy, that their concerns are being listened to and that their child is engaging in an accessible curriculum (Burrows, 2004; Parsons et al., 2009; Whitaker, 2007).

Home-school communication

Communication between home and school currently takes a range of different forms and can occur through phone calls, email, informal notes, formal reports or parent/teacher interviews and parent signatures in diaries (Cameron & Lee, 1997; Kervin, 2005). For schools with children with AN, it is common to find communication occurring more frequently, using the methods listed above and/or through the use of paper diaries (PDs), which are written in by the teacher and sent home daily (Beveridge, 2007; Burrows, 2004).

Parents as active contributors

According to Epstein's Overlapping Spheres of Influence (1995), parents should be an active group in the communication process, contributing towards decisions about what home-school communication should entail. However, Hughes and Greenhough (2006) found in practice, the opposite to be true, explaining: "Decisions about the form, quantity, frequency and content of school-home communication are made primarily by school staff, and it is relatively rare for parents to be involved—or even consulted—in this process" (p. 472).

Continuing the idea that parents should be active members in the communication process, it is disappointing that many schools hold the notion that information is passed in one direction, from the school to the home, rather than the idea that parents also have valuable information to share about the child (Bull, Brooking, & Campbell, 2008; Harris & Goodall, 2008; Marsh, 2003). As explained by Harris and Goodall (2008):

> Throughout the case studies there are phrases which support the view that information is something schools give to parents, who are the main passive

receptors rather than active agents in the learning of their children; parents have been 'spoken to', have been 'given information' (p. 37).

Hughes and Greenhough (2006) contend: "one way communication lines discourage parents sharing their opinions or experiences about the child, which could provide essential information and create a much better picture of what is happening" (p. 472). Information shared by parents can enable teachers to create a more personalised learning experience based around the child's own interests. According to Hughes and Greenhough (2006), a personalised curriculum can be a great motivator for children with AN and can particularly benefit children with AN (Cameron & Lee, 1997). To conclude, Amie (2014) suggests that schools could provide more guidance for parents on how to engage more with their child's learning at home, using these ideas.

Children as active contributors

In Epstein's 'Spheres of Influence', the child is at the centre of the diagram, and research shows that in order for the school, home and community to have the biggest impact; the child should be included in the home-school communication process (Ludicke & Kortman, 2012). However, in many schools this is not the case, and therefore, schools should seek to find new ways to include and engage children in the communication process (Edwards & Alldred, 2000).

The community as active contributors

Many parents of children with AN use outside agencies to provide extra support for their child and often their input is isolated from the rest of the child's learning. Under the Three Spheres of Influence, this would not work as effectively as it could have if these agencies in the community worked together with home and school (Epstein,1995). Using a shared communication system, the outside agencies

could become more involved and work together with the parents and teachers to achieve a shared outcome for the child. As Emerson et al. (2012) explain: "engaging the community in learning can facilitate increased communication and collaboration between support services beyond the school" (p. 44).

Other aspects of home-school communication

To support the child's learning and help to engage parents, home-school communication should involve teachers giving feedback to a child on recent work completed at home. Hattie and Timperley (2007) describe feedback as: "one of the most powerful influences on learning and achievement" (p. 81). In a study carried out by Hattie (2007), feedback that made the biggest impact was when students received feedback about a task and how they could improve it. Feedback that made the least impact was when students received compliments or reprimands (Hattie & Timperley, 2007). Feedback provided in multimodal ways, such as video or audio recordings, also showed to have a large impact on the child (Hattie & Timperley, 2007).

Barriers to effective communication

There are many barriers that can prevent effective home-school communication from taking place. Time is highlighted as one issue (Cameron & Lee, 1997; Harris & Goodall, 2008), where parents may be working full-time, have extra responsibilities (Cameron & Lee, 1997), or experience challenges with childcare (Harris & Goodall, 2008). Research has shown that a parent's demographics can influence their involvement in school. The key areas have been identified as ethnicity, the educational level of the parent and socioeconomic status (Harris & Goodall, 2008). Parents often come from a variety of backgrounds and their socio-economic situation can be a factor in their communication with schools. As Harris and Goodall (2008) state: "socio-economic status (SES) mediates both parental engagement and pupil achievement" (p. 25). For parents with poor literacy skills or from a non-English

speaking background, they may have difficulties reading and/or understanding communication sent home (Hansuvadha, 2009; Harris & Goodall, 2008). Other parents may have been discouraged from attending school due to their own bad childhood memories (Taub, 2006). Any of these challenges can become more pronounced for single parent families (Harris & Goodall, 2008). In addition to these barriers, some parents have reported finding schools difficult to reach and have been unavailable to meet at times that are convenient to the parent (Cameron & Lee, 1997; Harris & Goodall, 2008).

As previously discussed, in some schools where communication books are used, communication lines can be one-way, with teachers sending information home, but receiving little in return (Hughes & Greenhough, 2006). This may be due to uncertainly around the purpose of these books (Burrows, 2004). Therefore, if a communication system is introduced, it is imperative that expectations on the use of this method are clearly explained. An additional potential barrier with PDs is that they are reliant on the child transporting them between home and school. Having a physical book means these are often lost or forgotten and sometimes even deliberately mislaid (Burrows, 2004; Cameron & Lee, 1997).

In order for a home-school communication system to work effectively, messages need to be timely (Amie, 2014). This means sending out messages about incidents or events that have happened immediately after, as well as sending any feedback soon after work has been completed. Sending information home that is timely, honest and a true representation of the child will help the teacher to develop a relationship with the parents. As Emerson et al. (2012) explain: "Consistent dialogue between parents and schools builds trust between the two parties, which is essential in sustaining positive relationships and building partnerships" (p. 38). Once a positive relationship has been established between home and school, Bull et al. (2008) advises that the communication should then focus on the learning of the child.

A communication tool that facilitates effective home-school communication is essential to facilitate collaboration and continued learning at home. Therefore, it is imperative that more options are explored to overcome the barriers highlighted above and schools work to establish an effective communication system that involves schools, homes and the wider community.

The Role of Technology in Home-School Communication

This section will discuss the history of Information and Communication Technology (ICT) in an educational setting. Reasons will be provided as to why there is a need for change in the way schools communicate with home. Research will be presented on how ICT has been used to communicate in the past and then a review will be carried out discussing why mobile digital devices could present a more effective communication tool. Finally, ideas will be provided on how schools could implement mobile digital devices as tools for communication.

History of technology in an educational context

During the 1980s, home computers were first realised and they have played an increasing role in education (Kerawalla & Crook, 2005). Since then, computers and their application in the classroom have changed significantly and no longer consist of single computers placed in the corner of a classroom, used sporadically to perform tasks additional to classwork. Instead, computers accommodate the regular integration of more mobile devices such as: laptops, desktop computers, as well as tablets being used to learn new concepts, create content and collaborate beyond the classroom. Used effectively, ICT can transform and redefine learning in the classroom and research purports that in many cases, ICT can support children in achieving greater learning outcomes (Cardon, 2012; Lewin & Luckin, 2010; Willis et al., 2013).

The need for change

Research shows strong links between home and school can produce positive outcomes for children (Beveridge, 2007; Ludicke & Kortman, 2012; Melhuish et al., 2008; Ramirez, 2001); however, establishing effective communication between home and school continues to prove challenging to schools (Cucchiara & Horvat, 2009; Elbaum, 2014; Horvat et al., 2010). Currently home-school communication is achieved using a range of methods, including face-to-face contact, telephone calls, emails, text messages and notes.

However, a variety of challenges have posed barriers to the effective use of these methods which have included a reluctance or absence of parties making time to communicate, parents and teachers finding convenient times to meet (Cameron & Lee, 1997; Harris & Goodall, 2008), and the parents' reluctance to visit the school (Taub, 2006). As previously discussed, for schools using PDs, there is the possibility of the child losing or forgetting the book (Burrows, 2004; Cameron & Lee, 1997). Kosaretskii and Chernyshova (2013) argue: "It is well known that the traditional methods of communication between parents and the schools and teaching personnel are becoming less effective. New forms are needed besides the traditional notes to take home or after-class meetings" (p. 83). This view is also supported by Dubis and Bernadowski (2015). Kosaretskii and Cherynyshova go on to suggest technological based methods offer more features and can better meet the requirements for effective communication. As such, schools may wish to consider the use of ICT to establish and maintain home-school connections. Additionally, Olmstead (2013) claims most communication that needs to occur between home and school can be achieved through technology and in one study, a large percentage of parents and teachers were found to be in favour of using technology to facilitate parental involvement. Grant (2011) states: "for connections to be made between learning at home and in school, elements of both need to be drawn together in a space in which both are valued" (p. 292). Grant (2011) continues: "digital technologies could support

the creation of such virtual third spaces" (p. 292).

Research on the role of ICT within a school context

The little research conducted on the role of ICT to support home-schools links has shown beneficial outcomes for teachers, children and parents (Department for Education and Skills, 2003; Grant, 2011; Kervin, 2005; Lewin & Luckin, 2010; Olmstead, 2013). As Lewin and Luckin (2010) state: "when introduced, supported and used appropriately, technology can improve links between home and school learning and close the gap between parents, teachers and learners" (p. 756). As far back as 2003, a study carried out by the New South Wales Department of Education found the most effective home-school communication was occurring in schools which were using ICT to support this process (NSW Department of Education and Training, 2003). Other studies into the use of ICT to support home-school communication have included the use of mobile telephones, voice mail, blogs, laptops and websites (Cameron & Lee, 1997; Grant, 2011; Lewin & Luckin, 2010). Each project experienced varying degrees of success; however, in all cases, ICT improved communication between home and school.

New developments in ICT

Since the introduction of the Google Android-based tablet in 2009 and the iPad in 2010, the use of mobile digital devices within the education system has greatly increased. Tablets have many features, which make them an ideal device to use in classrooms. Their intuitive nature allows teachers to focus on curriculum content, rather than needing to learn how to use the technology first. The touch screen enables easy manipulation of the content, through swiping, tapping or pushing fingers apart (Shareski, 2011), and the size and weight make the tablet a portable device that students of most ages can hold in their hands, prop up on a desk or carry around with

them (Cumming & Strnadova, 2012; Herbert, 2010; Siegle, 2013). Research shows that when mobile

The iPad is a particularly effective mobile device for children with AN as it offers a range of built-in accessibility features that allow for customisation to suit the needs of children with hearing, vision or motor skill impairments (Cumming & Strnadova, 2012). These include Voice Over, which will read aloud the full content on a screen; Zoom, which allows students to zoom up to 500%; and Speak Auto-text, which will speak aloud suggested corrections while students are typing (Cumming & Strnadova, 2012; Linder et al., 2013). Additional features include Assistive touch, which enables teachers to program gestures that will replay when the student touches the screen, and Guided Access, that allows teachers to lock the device down to one application, making the management of these devices in classrooms an easier task.

Although laptops and smartphones are also viewed as mobile digital devices, the majority of research found on the impact mobile digital devices have on learning outcomes, particularly in Australia, has been based around tablet technology. Additionally, iPads were found to be the most commonly used tablet used for research purposes, when studying the impact of tablets on children with AN.

iPads in mathematics: In a study by Haydon, Hawkins et al (2012), a comparison was made between using an iPad and a more traditional worksheet to present maths problems to three students with emotional disturbance. During the sessions, the children worked through the problems at a faster speed than on worksheets. In addition to this, it was noted levels of engagement in the work were noticeably higher (Haydon et al., 2012), as was the case in a study carried out by O'Malley, Jenkins et al (2013). Haydon, Hawkins et al (2012), concluded a key reason for these results was the immediate feedback the iPad provided. If students received a correct answer, they were more likely to have a go at the next question and if they got a wrong answer, a scaffolded approach was used to support the student in getting the right

answer next time. Another study with O'Malley, Jenkins et al (2013), was conducted with 10 students with AN trialling the iPad to improve student's basic calculation skills. The outcomes also pointed favourably towards the use of the iPad, from the student's and teacher's perspective.

iPads for Reading: Several studies have been conducted on iPads and their impact on reading levels in schools. One study carried out in the United States, used the iPad to provide an intervention program for a Year 5 child with Attention Deficit Hyperactivity Disorder (ADHD) who was below age-expected levels in reading. In the six-week study, the student made a year's progress and in addition to this, his attention span noticeably improved. Suggested reasons for the successful outcome was the iPad's multiple modes, which provided a different learning experience and the opportunity for the child to hear his own voice recordings and identify his own errors (McClanahan, Williams, Kennedy, & Tate, 2012). In a separate study also conducted in America, 30 students with ASD were studied, from grade 6 upwards, to students between 18-22 years of age. In the study, each child's comprehension was compared when reading paper books to eBooks on the iPad and in the majority of cases, comprehension improved when students read material on the iPad (Price, 2011).

iPads for improving conversational play: Play is an essential part of early years learning, as it is a place where many early friendships can be formed (Murdock, Ganz, & Crittendon, 2013). However, "symbolic play can be a complex endeavour for a child with Autistic Spectrum Disorder (ASD)" (Murdock et al., 2013, p. 2174). Murdock, Ganz et al (2013), conducted a study into the use of the iPad to develop play techniques. The research was carried out in the United States with four pre-school children with ASD. At the end of the study, all the children showed they had improved in their use of talk during play. It was noted that iPads were particularly effective for this research as they improved engagement, thereby lessoning the chances of behaviour issues, their size made them easily portable and they supported the

presentation of a range of multimedia content, including images, video and audio (Murdock et al., 2013).

iPads for supporting video modelling: The iPad has been used to support video modelling for students with ASD in several research projects (Cardon, 2012; Jowett, Moore, & Anderson, 2012; Kagohara, Sigafoos, Achmadi, O'Reilly, & Lancioni, 2012). Video modelling (VM) is the modelling of a behaviour or skill through recorded video that children learn to imitate. Corbett & Abdullah, (cited in Cardon, 2012) suggest: "VM is an effective method because it capitalizes on characteristics associated with ASD (e.g., over-selectivity, social deficits, preference for visual stimuli)" (p. 1390). In Australia, research conducted by Jowett, Moore et al (2012), demonstrated how video modelling could be used to teach number recognition, formation and counting to a five-year-old student with ASD. A second project focused on training caregivers to create videos to model desired behaviours to their children using the iPad (Cardon, 2012). A third study looked into the use of video modelling to support two teenagers with ASD with the effective use of the spell-check function on the word processor (Kagohara et al., 2012). All three interventions were highly successful and all students involved demonstrated the expected skills by the end of the research period (Cardon, 2012; Jowett et al., 2012; Kagohara et al., 2012).

iPads to support task completion: In addition to the curriculum areas described above, a study was carried out by O'Malley, Lewis et al (2013), to find out if iPads could be used to support the completion of tasks by a group of students with ASD. The results suggest the iPad can be a highly effective tool in supporting students with task completion, as well as helping to reduce negative behaviours and promote independence for the students (O'Malley, Lewis, et al., 2013).

iPad Trials across Australia: iPad trials in special education have been conducted across Australia, including the Northern Territory, Queensland and Victoria. Each one has shown successful outcomes in a range of areas.

In Queensland, a trial was carried out in a special education program within a mainstream school, also for six months. They found, in addition to the iPad improving engagement for students, the iPad was particularly beneficial for children with multiple impairments (Queensland Government, 2011).

Two special schools took part in the iPads for Education trial in Victoria. In both schools, teachers found the iPad to be accessible to more students than any other technology. Other key outcomes included the ability to personalise learning for individual students and an increase in student motivation and engagement (Victoria State Government: Education and Training, 2017).

Tablets have proven to be a highly effective tool when educating children with AN. In areas of the curriculum such as reading and mathematics, changing behaviours and learning new skills, the iPad has transformed learning. The conduct of iPad trials across the country is a clear indication that the education system is seeing the benefits of this technology and is keen to continue exploring the possibilities.

ICT and communication

ICT can offer many additional features to enhance communication (Bouffard, 2008; Grant, 2011; Kervin, 2005; Olmstead, 2013). With many children already using mobile digital devices to email, text and contribute to social network sites, it makes sense for schools to explore the use of these tools to support the home-school communication process. As Kim, Hagashi, Carillo, Gonzales, Makany, Lee and Gàrate (2011) confirm: "Mobile devices are highly portable, easily distributable, substantially affordable, and have the potential to be pedagogically complementary resources in education" (p. 465). Shuler (2009) concludes: "Mobile technologies have the power to promote and foster collaboration and communication, which are deemed essential for 21st-century success" (p. 5).

Immediacy*:* An advantage of communicating electronically is that users would not need to be in the same place at the same time. This aspect would particularly benefit families where both parents work full-time (Kosaretskii & Chernyshova, 2013). Using ICT would also enable parents and teachers to access and reply to the messages at a convenient time. Sending messages straight away (Kosaretskii & Chernyshova, 2013), and being able to view information immediately (Kervin, 2005; Olmstead, 2013) are also great advantages to digital communication. If a child had completed an outstanding piece of work, a picture could be captured and a message sent during the lesson. They might even receive a congratulatory reply before the end of the same lesson. This is in direct contrast to paper-based communication methods, where the teacher or parent would need to wait for the child to bring the PD home or to school.

Other advantages include being able to send information to a group of families with just one click (Bouffard, 2008). The initial set up would involve creating a distribution list with all the parents that a teacher could quickly click on to send class information, such as weekly events and changes in the timetable. This would make contacting a whole class of parents an extremely efficient process.

If ICT was to become the main means of communicating, and the interaction included linkages to other electronic records belonging to the child, then significant efficiencies could be made. These would include both storing and distributing data relating to child attainment for example and other key documentation (Bouffard, 2008).

Participation*:* For those parents who have not engaged with the school, ICT offers a new way of being involved. As Kervin (2005) explains: "Learning Technologies have the potential to involve, encourage interaction and response from those parents who have previously felt disconnected from schools" (p. 153). Some parents have reported feelings of intimidation at the idea of meeting teachers in person, or speaking to them

on the phone, as they feel pressured to provide feedback immediately (Kosaretskii & Chernyshova, 2013). However, ICT presents information in a less threatening way, as parents are presented with time to think and even replay the information before providing their response at a time convenient to them (Kervin, 2005). An additional observation is that messages sent electronically are regarded as more informal and therefore encourage more involvement from parents (Kosaretskii & Chernyshova, 2013). Furthermore many of the tools offered through ICT, such as WIKIs, blogs and email, facilitate a two-way sharing system, thereby enabling parents to become equal contributors to the learning process (Olmstead, 2013). This contrasts with many paper-based or face-to-face approaches where parents do not feel encouraged to share their own opinions so readily (Kervin, 2005).

In addition to its ability to facilitate more participation from parents, ICT could enable a greater sharing of information with outside agencies that usually work with the children in isolation. Through ICT based communication, outside agencies could become more involved and work together with the parents and teachers to achieve a shared outcome for the child (Australian Research Alliance for Children & Youth, 2012), thereby increasing chances of success for the child (Ludicke & Kortman, 2012; Welchons & McIntyre, 2015).

As children are at the centre of the communication process, they should be included in most of the correspondence between home and school (Ludicke & Kortman, 2012). To ensure their successful contribution, they would need to learn how to use the technology, require support throughout its duration and encouragement to add their own voice to the communication process (Grant, 2011).

Added functionality: Current methods used to support communication between home and school are focused primarily on writing. Although email is currently being used in some schools, the focus is on using text to communicate, rather than other features ICT offers, such as photographs or video. Zhang (2011) suggests more

research should be done to find effective strategies to enable parents to talk to their children about their experiences during the school day.

For children with AN, many struggle to recount events or learning that have taken place during the day (Delaherche et al., 2013). If photographs or video of the child participating in the day's learning were uploaded as part of a diary entry, these could provide a prompt to support dialogue at home with their parents. Video can act as a powerful visual aid as it enables people to see what is happening. This was demonstrated in a study carried out by Hughes and Greenhough (2006) where lesson was videoed and sent home to each of the parents to show what was happening in the classroom. One of the parents commented that the video: "Opened up the world of school to us" (Hughes & Greenhough, 2006, p. 476). Curtiss et al. (2016) states: "Collaboration between parents and practitioners using technology gives practitioners and families practical opportunities to bring instructional strategies from school into the home, which may lead to promising child learning outcomes" (p. 166).

Some of the parents in the same study used the information learnt and tried applying the strategies they had seen employed by the teacher at home: "This parent suggested that she had tried to follow this approach when listening to her son read at home" (Hughes & Greenhough, 2006, p. 478). Curtiss et al. (2016) reports on a study that provided lessons to parents online on how to effectively reinforce strategies learnt at school. Early results showed positive outcomes; however, Curtiss et al. (2016) states the need to transfer this knowledge to use in real life contexts to see real outcomes. Being able to share information using different media really opens up possibilities, as demonstrated in these studies above. There is great potential with using media so that parents and teachers can see what the child has been doing at home or at school, and for parents to repeat strategies at home when reinforcing concepts learnt at school.

ICT as a communication tool

There is strong evidence to suggest the use of ICT can improve communication between home and school (Grant, 2011; Lewin & Luckin, 2010; Olmstead, 2013); however, if schools make the decision to implement ICT into their communication policy, there are key factors to be considered which can influence the success of these tools. In research projects where ICT has not made a visible difference to home-school communication, it has been as a result of lack of knowledge, understanding or application of ICT, from the teacher or parents (Department for Education and Skills, 2003). In a study where technology was trialled as a tool for facilitating homework, it was found parents did not have the necessary knowledge to use the ICT effectively (Lewin & Luckin, 2010). Therefore, if schools choose to implement ICT as a tool for facilitating home-school communication, a professional development plan needs to be built into the strategic school plans, and fully supported by the leadership team, to ensure its success (Olmstead, 2013). In addition to this, training needs to be provided to parents to ensure they understand how to use the ICT and its purpose in supporting clear communication lines between home and school (Lewin & Luckin, 2010). Sessions could take the form of an information night; where parents were shown the benefits of ICT in a school context, a shared vision was provided of what the school hoped to achieve with ICT and communication, and some time was offered for parents to have a hands-on experience with the tools.

In the home, research shows parents are reluctant to use ICT for communicating as they don't feel they have the required knowledge (Kosaretskii & Chernyshova, 2013). Additionally, Bouffard (2008) discusses how many people still don't have Internet access. These would need to be considerations for a school thinking about using ICT as its main communication process.

Once the online relationship had been established, it would be important to introduce the idea of using the ICT to support the child's learning at home. ICT could

be used creatively at this point as, not only could it provide support to the child, but also provide support to the parent to model how they can help their child at home. As Lewin and Luckin (2010) state: "Parents require support and effective communication with regards to the best ways in which they can engage with their children's learning in the home" (p. 756).

It would be important to continue other methods of communication whilst this method was in the early stages, and situations, such as the ones above, where parents don't have easy access to the Internet, or ICT tools. Other situations would be when face to face contact is more appropriate; for example, when teachers are dealing with concerns about behaviour or progress (Kosaretskii & Chernyshova, 2013).

With clear guidelines, there is emerging evidence that ICT can become an effective tool in facilitating home-school communication. More needs to be done to encourage schools to explore the potential of technological devices and platforms in providing a more effective means of establishing and maintaining effective communication between parents and teachers. At the start of the implementation of a new system, extra work would be required for schools as policies would need to be written, teachers and parents would need training and any challenges would need to be overcome during the trial period. However, the outcomes for teachers, parents and most importantly, children, could be rewarded, with improved home-school communication and parents better equipped to further support their child's learning at home.

Within the literature review, the current provision for children with AN in Australia has been discussed and the challenges faced by children with AN, and by their parents and teachers, has been explained. Following this, the importance of home-school communication was explored, along with the role of technology in effective communication. From the literature, it is clear that with so many children in Australia with AN, a comprehensive and holistic communication system is essential to

support communication between home and school. The current paper methods being used in schools are providing little information to parents and schools should be considering other methods, including the use of mobile digital devices to support this process more effectively.

The Research Questions

The following research questions were investigated:

1. What do parents and teachers of primary aged children with an additional need want from home-school communication?
2. How does home-school communication compare between the use of a paper diary and a digital diary for teachers and parents of primary aged children with an additional need?

In this instance, when comparing the paper diary (PD) and digital diary (DD), these aspects were focused on:

- When and how the diary entries were made; for example, the time of day the entry was made and, in the case of DDs, what device the entry was made from.
- The communication mode used; for example, if the entry had been handwritten, typed, voice recorded, videoed or included the use of images.
- The detail of entries; for example, how much detail was provided in each DD entry compared with the PD; and
- The content of the entries; for example, if the topics of conversation differed in the DD compared with the PD.

Theoretical Perspective

Constructivism focuses on the individuals' development of knowledge as they

experience different situations (Collins, 2010). While a group of people may experience the same situation, their interpretations are all individual in nature (Collins, 2010). This study therefore sought to provide answers to the research questions through analysing individual perspectives of the innovation, demonstrated through the pre and post innovation interviews, and the individual responses towards the innovation, demonstrated in the DDs, over the course of the innovation. These individual perspectives and responses formed a collective understanding of the questions being researched through a multiple case study approach, as the researcher used the individual interpretations to form a collective understanding of how the thoughts of teachers and parents compared, and also how the level of communication between home and school compared, before and after the digital diary innovation (DDI) (Simons, 2009). A grounded theory approach was used in this study, where the theories underpinning the research w constructed through an analysis of the data obtained from the interviews, questionnaires and DDs (Bell, 2010).

Conceptual Framework

A review of the literature informed the conceptual framework for this study. Home-school communication is an essential part of every child's education (Australian Research Alliance for Children & Youth, 2012; Harris & Goodall, 2008; Heath et al., 2015; Zhang et al., 2011). However, the challenges of effective home-school communication present ongoing problems for many schools as a result of home-based or school-based difficulties (Hall et al., 2003; Stanley et al., 2005). For schools using PDs to support home-school communication for children with AN, these are proving to be ineffective in many cases (Hall et al., 2003; Hansuvadha, 2009; Kosaretskii & Chernyshova, 2013).

Research shows the importance of the parents, teachers and community working together to achieve the best learning outcomes for the child, as demonstrated in the Venn diagram taken from Epstein's overlapping spheres of

influence model (1995). An effective home-school communication tool is therefore essential in order to facilitate this relationship. Particularly for children with AN, a range of outside agencies are often involved in the child's education, such as speech and language therapists, educational psychologists, social workers and other health professionals. It is important to involve these additional community members in the communication to enable everyone to work towards a shared goal (Janus et al., 2008). The arrows connecting each of the groups are pointing in two ways to depict the importance of two-way communication, which facilitates active participation from all parties (Johnsen & Bele, 2012; Soto-Chodiman et al., 2012).

When home-school communication is effective, parents are empowered to be involved fully in their child's education (Epstein, 2002; Harris & Goodall, 2008). Research shows this involvement can lead to effective collaboration, when all participants are actively sharing information relating to the child's learning and working together to overcome difficulties (Beveridge, 2007; Ludicke & Kortman, 2012). It can also enable parental engagement, when parents begin to engage in their child's learning at home. This is identified as an essential element of parental involvement, as it makes a significant difference to the child's learning outcomes (Australian Research Alliance for Children & Youth, 2012; Harris & Goodall, 2008; Zhang et al., 2011). As well as effective collaboration and parental engagement, effective home-school communication can lead to child participation in their own learning, which is arguably essential to the ongoing development of the child (Ludicke & Kortman, 2012). These three areas were identified as key in the literature review in enabling better learning outcomes for the child. Therefore, research shows new methods of communication are essential in enabling the best possible learning outcomes for children (Australian Research Alliance for Children & Youth, 2012).
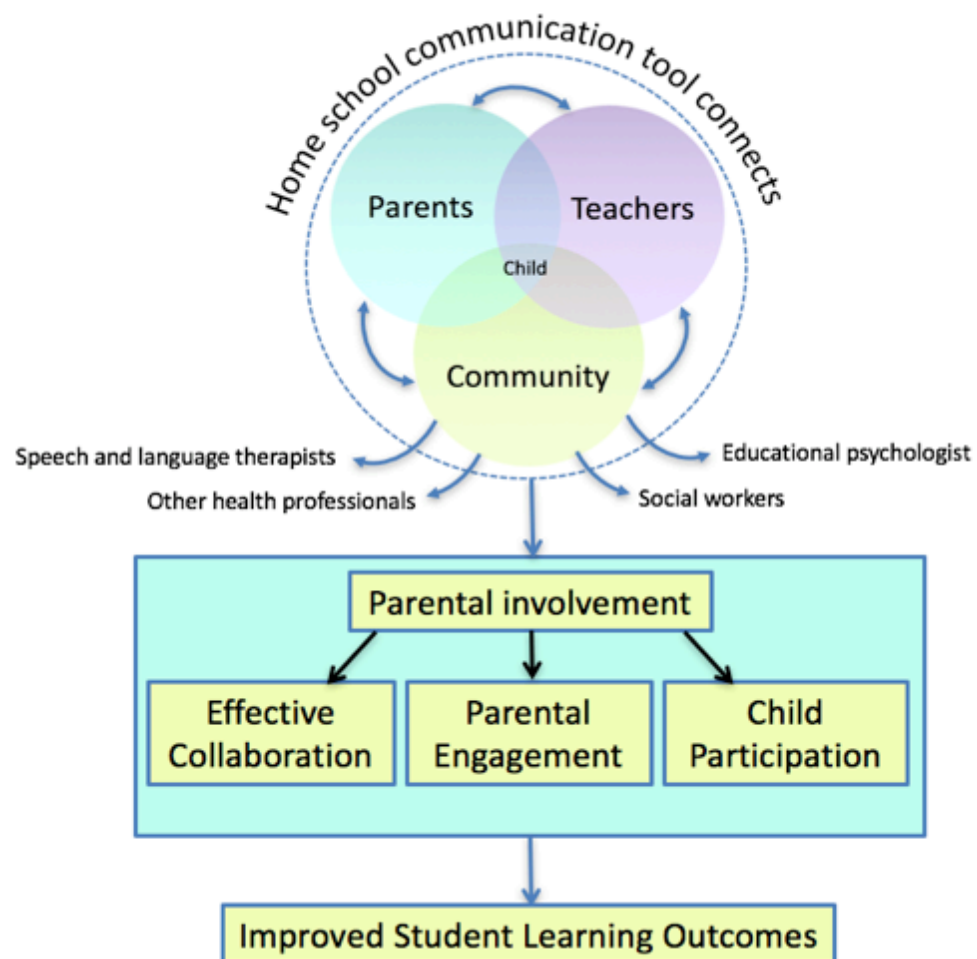
Figure 2.2: Conceptual Framework

CHAPTER THREE: METHODOLOGY

The research was conducted to find out if the digital diary (DD) could improve home-school communication for children with additional needs (AN). The study was designed on the need for alternative methods to be used for parents and teachers of children with AN to communicate, as research showed many of the current methods were not working effectively. A multiple case study approach was used to identify parents' and teachers' perspectives between the use of a paper and digital diary. These methods were used to investigate whether a DD would serve as a more effective communication tool and what features of the DD facilitated this.

This chapter will begin by describing the study school. Following this:

1. The research approach will be discussed.
2. An overview of the participants will be given.
3. The methods used for data collection will be discussed.
4. An explanation and justification for the use of Evernote will be discussed.
5. An overview of the innovation will be presented.
6. A table will show the phases of the research conducted.
7. An explanation will be provided on how the data was analysed.
8. Finally, a summary of the ethical considerations will be shared.

Description of the Study School

The study took place at a large independent school in Perth, Western Australia. The name 'Gosmere School' in the study is a pseudonym to ensure the identity of the actual school remains anonymous. The school was a mainstream K-12 school, located in a high socio-economic area. The school catered for children with a mild AN; however, specialist schools and public mainstream schools are also available for children with AN throughout the Perth metropolitan area. The children with AN who attended the study school were integrated into the mainstream classroom for most of

their school day; however, they also had withdrawal sessions with the special needs coordinator, to ensure extra support was provided for their AN.

Research Approach

The study aimed to investigate individual thoughts of home-school communication. Through the use of a digital diary innovation (DDI), it also aimed to find out if and how mobile digital devices presented a more effective tool for communication. This section of the chapter will justify the use of a qualitative approach and the use of multiple case studies.

Qualitative study

The study involved making key decisions about the approach used to ensure the relevant data was collected to effectively answer the research questions. These key decisions were based around the need for data that reflected individual perspectives around the issue being studied, a need to collect data within the natural setting of the school and finally, that an inductive process would be used to analyse the data to allow for key themes to emerge (Creswell, 2013). Bell (2010) discusses how a qualitative approach allows the researcher to develop an understanding of individual participants' perceptions. Collecting qualitative data enabled the researcher to find out how DDs impacted on the home-school communication process from the teachers' and parents' perspectives. Learning about the individual perspectives would not have been possible through the use of quantitative methods, as explained by Creswell (2013): "Interactions among people; for example, are difficult to capture with existing measures … to level all individuals to a statistical mean overlooks the uniqueness of individuals in our studies" (p. 40). Therefore, a qualitative approach was chosen to guide the research.

Multiple case study approach

A multiple case study approach was the chosen research method. The reason for using multiple case studies was because of the level of detail in which the researcher could collect from individual participants intrinsic to the Gosmere School context. Another reason for choosing a case study approach was because it enabled the collection of data from multiple sources, which allowed for a greater understanding of participants' perspectives, as well as enabling greater validation of the data, collected. Additionally, the use of multiple case studies enabled a cross comparison, which in turn allowed for key themes to emerge from the data.

From the researcher's experience in special education, relationships between the school, parents and other support staff is complex and different for every individual. Case studies allow for a more detailed study of smaller groups of participants (Bell, 2010; Creswell, 2013; Denscombe, 2003; Payne & Payne, 2004), as well as providing a holistic view of each case (Punch, 2005). A research approach, which enabled an in-depth study of individual cases, was essential for developing a clear understanding of participant perspectives during the innovation. Using case studies allowed the researcher to have detailed discussions with each participant, make individual contact with the participants to discuss any issues, and to develop a good understanding of the participants' changing perceptions over the course of the innovation. This allowed for a comprehensive understanding of the problems experienced in home-school communication prior to the innovation, as well as finding out how individual participants felt the DD could provide solutions to the problems experienced.

The second reason for using a case study approach is that it encourages the use of a variety of data collection methods (Creswell, 2013; Denscombe, 2003; Punch, 2005). As Denscombe (2003) states: "Whatever is appropriate can be used for investigating the relationships and processes that are of interest" (p. 31). Using a

range of data sources was particularly valuable during this study as the combination of sources provided clearer and more detailed feedback from the participants than would have been possible from a single source. Additionally, it allowed the participants multiple opportunities to express their views: through the questionnaires, interviews paper and DDs. Some ideas were consistent across all the data sources; however, there were several key ideas that came from individual sources that added further detail to the key ideas. Therefore, the variety of data collection methods enabled the production of rich data that expressed detailed ideas from the participants.

A benefit to using multiple case studies is the ability to make cross-case comparisons and conclusions (Yin, 2014). As data from the different sources were analysed, the researcher could identify similarities and differences experienced by participants during the innovation period. As the analysis of the data reached saturation, experiences, thoughts and feelings that had been experienced by most participants enabled the researcher to develop key themes across the cases.

Case studies have faced criticism because researchers can find it challenging to cross-check the information when data has only been collected about a single case (Bell, 2010). However, in this study, multiple cases were used and commonalties found across several of the cases. Additionally, the data to emerge from the different sources enabled a triangulation approach (Denscombe, 2003), thus providing a way to cross-check common themes across the multiple data sources.

Another point of criticism of case studies is they lack the ability to generalise with data from the small-scale case studies (Bell, 2010; Punch, 2000). However, Payne and Payne (2004) argue that small-scale case studies can still provide new information in a field that has not been explored in depth. Denscombe (2003) adds that if the case has particular characteristics, then it could present useful information about these particular cases that could be relevant to future cases with similar characteristics. In

this study, a review of the literature showed research about the benefits of home-school communication; however, very little research had been conducted on the use of ICT to support home-school communication. Therefore, the findings from this study could provide a starting point for further research in this area. Furthermore, the study took place in an independent school in an affluent area and the families from the study were shown to be living in a high socio-economic area. Therefore, it is reasonable to believe that similar data could be obtained from a similar study conducted in a comparable setting.

Study participants

The study focused on the teachers and parents of primary school children with AN. The case study groups needed to be teachers and parents of children with AN of primary school age. The AN looked at in this study included children with dyslexia, difficulties with reading, writing and other milder AN. These AN required support provided in smaller groups outside the classroom. Twelve potential families were identified that met the criteria. The Special Needs Coordinator had strongly encouraged the involvement of the teachers of children with AN and as a result, all of them had agreed to take part. Next a letter was sent home to the 12 families inviting them to participate in the study. The researcher was hoping for six families to agree to take part to ensure there were enough cases to study. Ten of the 12 families responded and the researcher used all 10 families. Of the 10 families taking part, two teachers had two children in each of their classes, which meant 10 parents (n=10) and eight teachers (n=8) making up the 10 case studies. In addition, one teacher went on leave during the study and was replaced by an additional teacher, making a total of nine teachers and 10 parents.

Case Study	Teacher	Parent
Case Study A	Teacher A *(TA)*	Parent A *(PA)*
Case Study B	Teacher B *(TB)*	Parent B *(PB)** Parents B *(PPB)** *(Both parents took part in the pre-innovation questionnaires and interviews; however, only one parent took part in the innovation and post innovation interview).
Case Study C	Teacher C *(TC)*	Parent C *(PC)*
Case Study Z	Teacher C *(TC)* (This teacher is also part of Case Study C)	Parent Z *(PZ)*
Case Study D	Teacher D *(TD)*	Parent D *(PD)*
Case Study Y	Teacher D *(TD)* (This teacher is also part of Case Study D)	Parent Y *(PY)*
Case Study G	Teacher G *(TG)*	Parent G *(PG)*
Case Study H	Teacher H *(TH)* Teacher I *(TI)* (TI replaced TH during the innovation)	Parent H *(PH)*
Case Study J	Teacher J *(TJ)*	Parent J *(PJ)*
Case Study K	Teacher K *(TK)*	Parent K *(PK)*

Figure 3.1: Participants of the case studies

Data Collection

The data collected during the study consisted of questionnaires, pre-innovation interviews, post innovation interviews, paper diaries (PDs), digital diaries (DDs) and further anecdotal evidence received via email or face-to-face.

Interviews

When considering the data collection methods, it was clear the type of data needed to answer the research questions was going to be varied in nature and that some would need to come from in-depth discussions with study participants, questionnaires and detailed analysis of written diaries. Yin (2014) states how interviews are an essential part of the data collection for case studies. In addition, Bell (2010) explains: "the interview can yield rich material and can often put flesh on the bones of questionnaires responses" (p. 161).

Semi-structured interviews

The pre-innovation interviews were semi-structured and aimed to investigate current perspectives around communication between home and school, such as what the parents and teachers thought of the current communication systems, problems experienced with communication and what they thought would be the advantages and disadvantages of using mobile digital devices to support communication. The post innovation interviews were similar in content and aimed to investigate what the parents and teachers thought of mobile digital devices as a tool for supporting communication, the problems experienced during the DDI and any advantages this form of communication had, compared with the previous communication method. The semi-structured interviews added valuable information to the existing data collected from questionnaires and the PDs and DDs. The reason for using semi-structured interviews was because the questions guided the interview and ensured

the data collected would help to answer the research questions. In addition, many of the interview questions were open to allow the participants to speak freely, without constraints, and provide their own ideas and opinions around the topics covered (Denscombe, 2003). Moreover, the use of a semi-structured approach enabled more efficient coding (Bell, 2010).

Interview conduct

The semi-structured interviews were conducted one-to-one with each participant. This meant each interview was easier to organise as only one person needed to be present with the researcher for each interview. As participants began talking about other issues unrelated to the topic, the researcher could steer the conversation back home-school communication (Denscombe, 2003). In addition to the positive management aspects of one-to-one interviews, the researcher felt one-to-one interviews would feel less threatening to participants and might encourage participants to speak more candidly. In the interviews, the researcher felt many of the participants spoke openly about their experiences, feelings and frustrations in relation to home-school communication, making one-to-one interviews extremely worthwhile.

Advantages and disadvantages of interviews: The first advantage of interviews was that the researcher had easy access to the participants (Denscombe, 2003). Conducting interviews at the school meant teachers were easily accessible and as most parents still brought their children to school, the researcher could organise times that worked around this. Additionally, Denscombe (2003) discusses the need to consider travel and time costs. The school was located at an easy travel distance for the researcher, which kept travel costs low. This meant the researcher could visit the school as often as necessary to ensure all participants were given an interview time that was convenient. In addition, the interview times were kept to 20 minutes and as it was only a small group being interviewed, the interviews could be conducted over the course of a week.

The second advantage of interviews was the level of detail that was learned from participants. One-on-one interviews were conducted with the participants to provide further data in addition to that already collected from the questionnaires. As Bell (2010) states: "the interview can yield rich material and can often put flesh on the bones of questionnaires responses" (p. 161). Interviews allowed for more detail to be provided to key aspects of home-school communication that would not have been heard through a questionnaire (Denscombe, 2003). As Creswell (2013) explains:

> This detail can only be established by talking directly with people, going to their homes or places of work, and allowing them to tell the stories unencumbered by what we expect to find or what we have read in the literature (p. 40).

In addition, having the face-to-face interview meant that if a participant had not answered a question fully, there was an opportunity to further probe them to find out any more information in this area (Bell, 2010; Denscombe, 2003). Having the ability to probe, enabled the researcher to gather more data that would have not been possible using other methods of data collection.

The third advantage to using interviews as part of the data collection process was they offered focus and enabled questions based around the topic the researcher was trying to investigate (Yin, 2014). They also offered flexibility in the questions being asked (Denscombe, 2003), whereby the researcher had the flexibility of being able to clarify answers as required to ensure all the necessary data was collected (Creswell, 2009; Punch, 2005; Yin, 2014).

The fourth advantage to interviews was that they captured thoughts, emotions and experiences that would not have been possible using a questionnaire (Denscombe, 2003; Yin, 2014). Home-school communication is an emotive topic as most parents want to feel completely involved in their child's education and many

teachers struggle to achieve a balance of sending the right amount of information to parents. These aspects are particularly prevalent for parents and teachers of children with AN. Denscombe (2003) discusses how interviews would be preferred rather than questionnaires in order to convey these experiences and feelings from participants. As he states: "The nature of emotions, experiences and feelings is such that they need to be explored rather than simply reported in a word or two" (p. 165). During the interviews, teachers and parents made many observations around home-school communication and each participant shared their own perspectives on the barriers and possible solutions. The interviews also revealed a range of emotions, including frustration, sadness, joy and excitement, which would not have been captured using questionnaires alone. This demonstrates the key role interviews had in the data collection process for this study.

The final advantage of interviews was their ability to work together with other data sources to validate the data collected (Denscombe, 2003). As interviews were compared alongside questionnaires and diaries, the interviews were used to triangulate the data and help to validate the data collected from the teachers and parents.

There were also disadvantages that the researcher needed to be aware of during the interviewing process. One disadvantage was that the participants' responses may not have been the same as what actually happened (Denscombe, 2003). However, using other data sources helped to validate this data. From the data collected from the questionnaires, diaries and interviews, data was then triangulated and checked.

Another disadvantage to interviews is that they can be conducted in unfamiliar spaces, where participants may not feel relaxed or able to share feelings readily (Creswell, 2009). In this study, most interviews took place in the withdrawal classroom used for the children with AN. This meant most of the teachers and

parents were familiar with this space and therefore, the researcher felt most of the participants relaxed in the early stages of the interviews.

A final disadvantage is that the apparatus used to record interviews can make participants feel self-conscious (Denscombe, 2003). However, modern recording devices are much smaller and less likely to take over the room. The interviews conducted were recorded through an audio application on an iPad and iPod and a backup to these recordings was done via field notes written by the researcher during the interviews (Denscombe, 2003). Therefore, participants ceased to notice the device as the interview progressed and the researcher felt this also helped participants relax during the interview.

Paper diaries, digital diaries and further anecdotal evidence

Data was collected from the PDs that were used to communicate between home and school and also from the DDs that were trialled during the innovation. As Denscombe (2003) states: "diaries are written by people whose thoughts and behaviour the researchers wish to study" (p. 216). As the trial was comparing the effectiveness of the DD to the PD, these two forms of communication were a crucial part of the data collection.

Advantages and disadvantages of the diaries: An advantage to using the paper and digital diaries was that they were accessible to the researcher at a time convenient to her (Creswell, 2009). The PDs were photocopied and analysed and the DDs could be accessed online. This also meant the analyses of the diaries could be conducted in private at a convenient time.

A second advantage to the use of diaries was that the words recorded were thoughts that the teachers and parents had been given time to think about and therefore, presented a more real picture of their actions and thoughts based around

home-school communication (Creswell, 2009). The thoughts and ideas recorded in the DDs clearly demonstrated the different emotions participants experienced during the DDI. This included excitement at seeing child achievements, enthusiasm at sharing a child's activities, as well as frustrations around homework.

Research also shows disadvantages when using diaries as a form of data collection. One disadvantage to the diaries was that the researcher had to first locate each of the PDs before analysing them (Creswell, 2009; Yin, 2014). Accessing the DDs was easy as the researcher could access them online; however, the researcher needed to look for each of the PDs and unfortunately, one of the PDs could not be found, which prevented an accurate before and after comparison for this case group.

A second disadvantage to using the diaries was that they could pry too deeply into the lives of the participants (Burgess cited in Bell, 2010). During the innovation, the researcher was conscious about this and therefore, made the decision not to comment in any of the DD entries during the DDI. In addition, participants were provided with an assurance that only the teachers, parents and the researcher, would read the content entered.

Questionnaires

Prior to the innovation, parents and teachers were asked to complete an ethics clearance form and then a short questionnaire to provide their own perspectives of the current home-school communication system. Questionnaires were used to ascertain basic information that elicited little or no emotion from the participants (Denscombe, 2003). The questionnaire used in this study was designed to gather basic information about the participants that provided additional details when analysing responses in the interviews diary entries. The three areas covered in the questionnaire were:

1. Current knowledge and application of ICT; for example, if the participant owned a smartphone and how often the participant used the Internet outside of work.

2. Basic perspectives of communication between home and school; for example, how the participants rated the current level of communication and the ways they have communicated with home or school previously.

3. Demographic information of the participant; for example, the gender and current occupation of the participant.

Advantages and disadvantages of questionnaires: The first advantage of a questionnaire is that information could be gleaned in a relatively short time (Denscombe, 2003). For the researcher, the questionnaire enabled rudimentary information to be collected to maximise interview time for more complex questions.

The second advantage to the questionnaire was that data collected was already coded (Denscombe, 2003). Most of the questions were written with limited options for participants to choose from for their answer. The interview was then used to ask further questions about the areas covered in the questionnaire.

A disadvantage of a questionnaire can be the low response rate (Denscombe, 2003); however, this is more likely if questionnaires are sent through the post or if the researcher has had no contact with the participants. Bell (2010) recommends presenting questionnaires in person rather than over the telephone or via email, as evidence has shown there is a much higher chance of people completing the questionnaires when they are presented in person. Therefore, the questionnaires were presented to the teachers and parents immediately prior to the interviews being conducted.

Another disadvantage to the questionnaire was that participants may not have fully completed the questions (Denscombe, 2003). However, as the questionnaire

was completed directly prior to the interview and then handed to the researcher, this presented an opportunity for the researcher to ensure all questions were completed and enabled the researcher to answer any queries the participants had to ensure the questionnaire was completed.

Observations

Although observations are noted as being a key method of data collection in qualitative studies (Creswell, 2009), they were not relevant for this study. This is because the study was focused on home-school communication. The researcher wanted to ensure the DD was used as authentically as possible and as diary entries made at school could have been completed at any time of the day, there was little chance of the researcher being in a classroom when a diary entry was made. The researcher also felt if she had organised times to be in a classroom, the teacher may have felt compelled to make a diary entry, thereby creating a false situation. For the diary entries completed at home by the parent, it was not appropriate to be there at the given time.

Evernote

Evernote was the digital application chosen for the purpose of the DDI. It was introduced in 2006 and has been used extensively in a variety of contexts (Welsh, France, Whalley, & Park, 2012).

Overview of Evernote

Evernote is an application that can be downloaded and operated on smart phones, tablets and computers. Like email, users create an Evernote account, after which they can access their data on any device running the application or through a web interface. Evernote enables users to create, share and store notes, checklists, photographs, web articles, videos, and audio files, to name a few. Content can then

be shared with other people for either viewing and or editing. In the following section, there is a brief description of the Evernote features used during the DDI. From henceforth and for ease of understanding, any Evernote content will be preceded with EN.

Basic functions

The basic functions of Evernote are described in the following sections:

Creating notes: To create an EN note, the user needs to select the option to create a new note in Evernote. A title can be added and then the user can begin typing the note (see Figure 3.2).
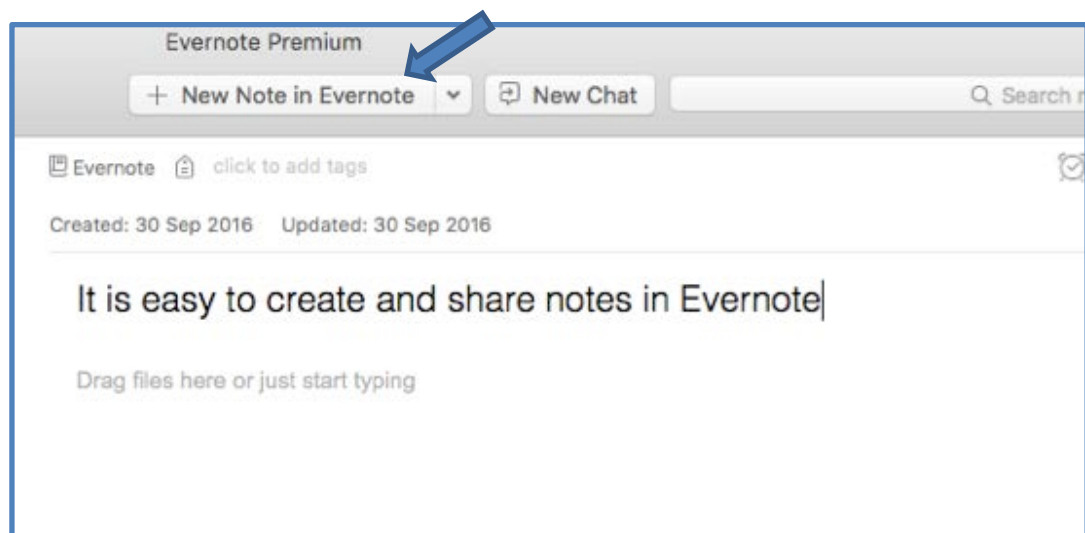
Figure 3.2: Adding a new note in Evernote

During the innovation, EN Notes were typed and audio recorded (see Figure 3.3). EN Checklists were also added and ticked off as items were accomplished (see Figure 3.4). In addition, documents such as photographs and PDFs could be annotated for others to see.

Evernote Premium

+ New Note in Evernote ⌄ New Chat Q Sea

Evernote 🔒 click to add tags

Created: 30 Sep 2016 Updated: 30 Sep 2016

Notes can be audio recorded

Evernote 20…9.04.54.wav
1.8 KB
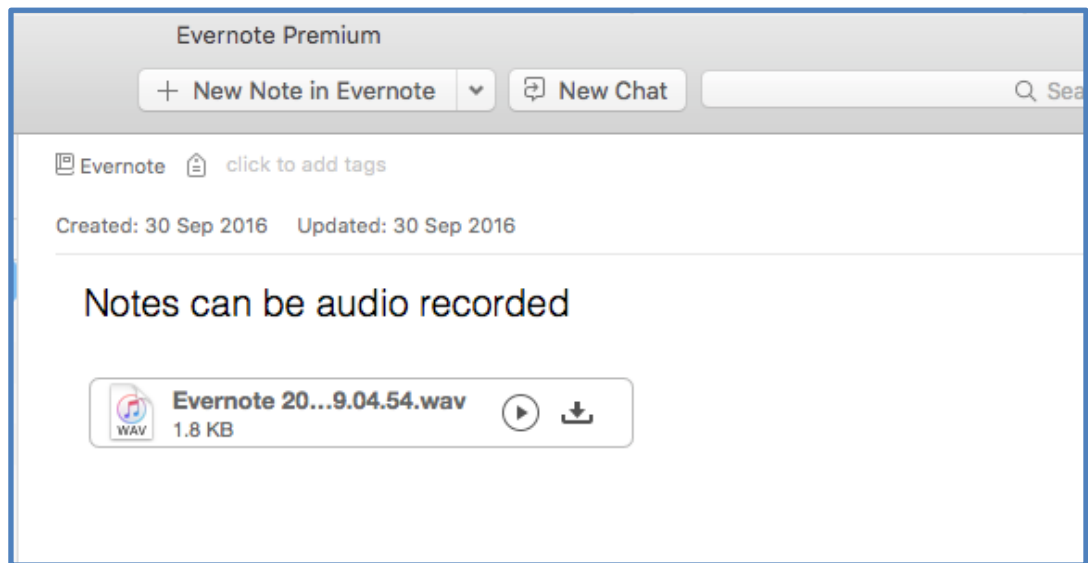
Figure 3.3: Adding an audio note in Evernote

Evernote Premium

+ New Note in Evernote ⌄ New Chat

Evernote 🔒 click to add tags

Arial 13 B *I* U a

Checklists can be created

☐ Learn how to use Evernote
☐ Make a note and share it
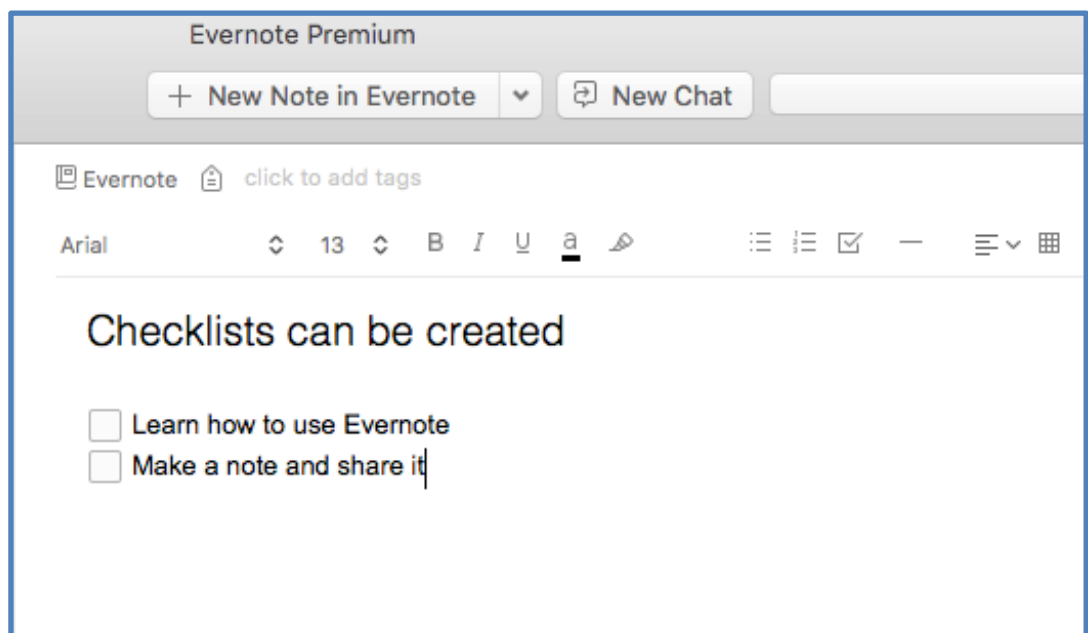
Figure 3.4: Adding a checklist in Evernote

Content: A range of content can be saved into Evernote, including photographs (see Figure 3.5), websites, and videos. Photographs were a common way of sharing children's learning during the innovation and photographs uploaded included: children working at their table, the outcome of a project or children presenting their

work in front of the class. Websites were also shared during the DDI to enable other users to access content that had been saved online.
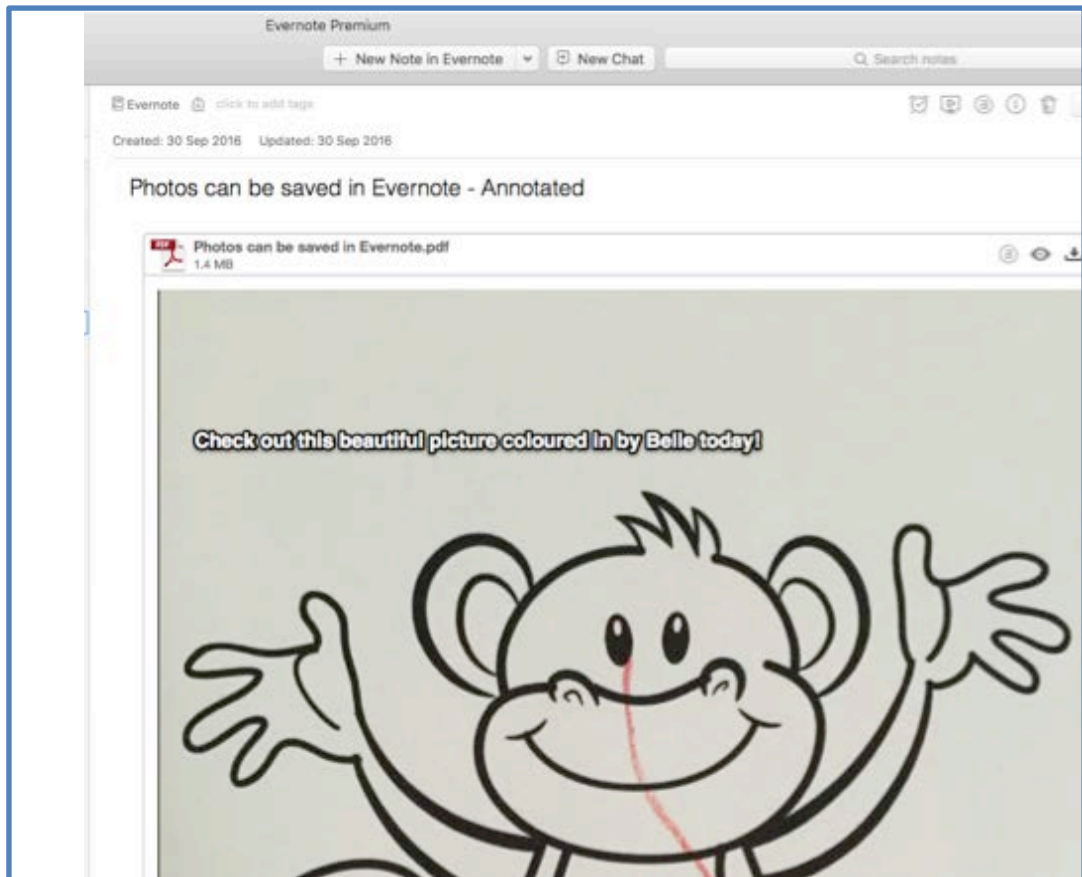
Figure 3.5: Saving a photograph in Evernote

Finding data: There are different ways to search for EN Notes. A keyword can be typed in the search field and then Evernote will show any notes containing the keyword searched (see Figure 3.6). With PDF documents, the search engine can locate any words or phrases within the document and if the document has been tagged with a keyword, documents containing this tag word can be found.
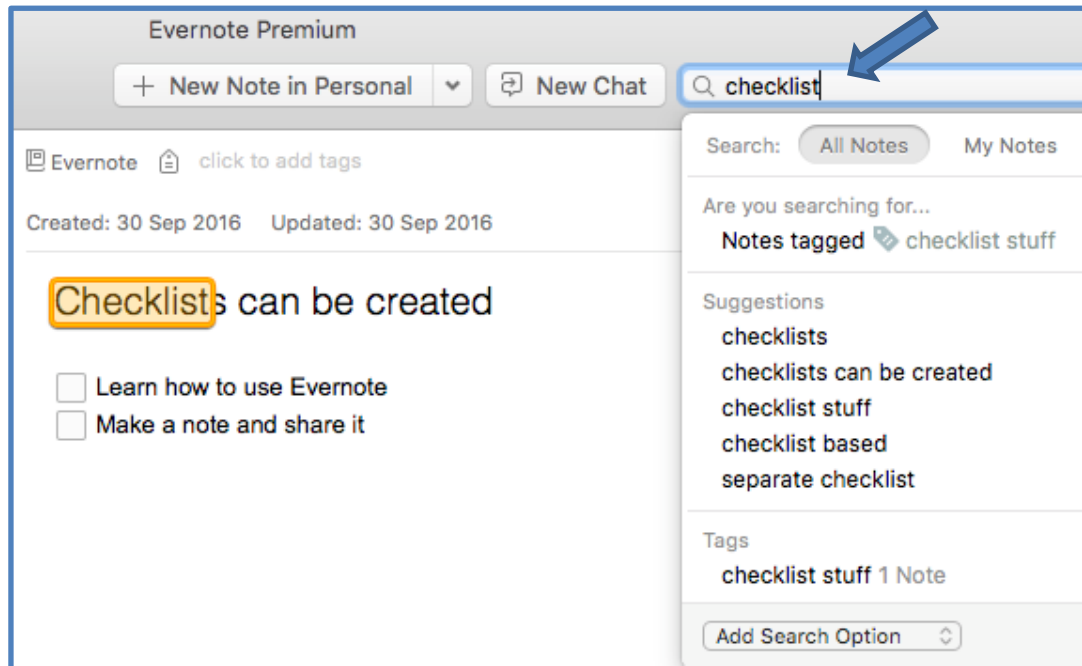
Figure 3.6: Using a keyword search

Sharing notes: Notebooks can be created and shared with other users to enable collaboration (see Figure 3.7). For the DDI, the researcher created an EN Notebook for each child in the innovation and shared the child's EN Notebook with the relevant teachers and parents. This enabled everyone involved to be able to create and share EN Notes within the relevant child's EN Notebook, thereby facilitating collaboration for all the users. Alternatively, single EN Notes can be shared with other users through their email address. Although this feature was not used during the DDI, this could be an easy way of sharing specific information with outside agencies or other relevant parties. A choice can be made when sharing single EN Notes to allow the person receiving the EN Note to just view or edit the EN Note.
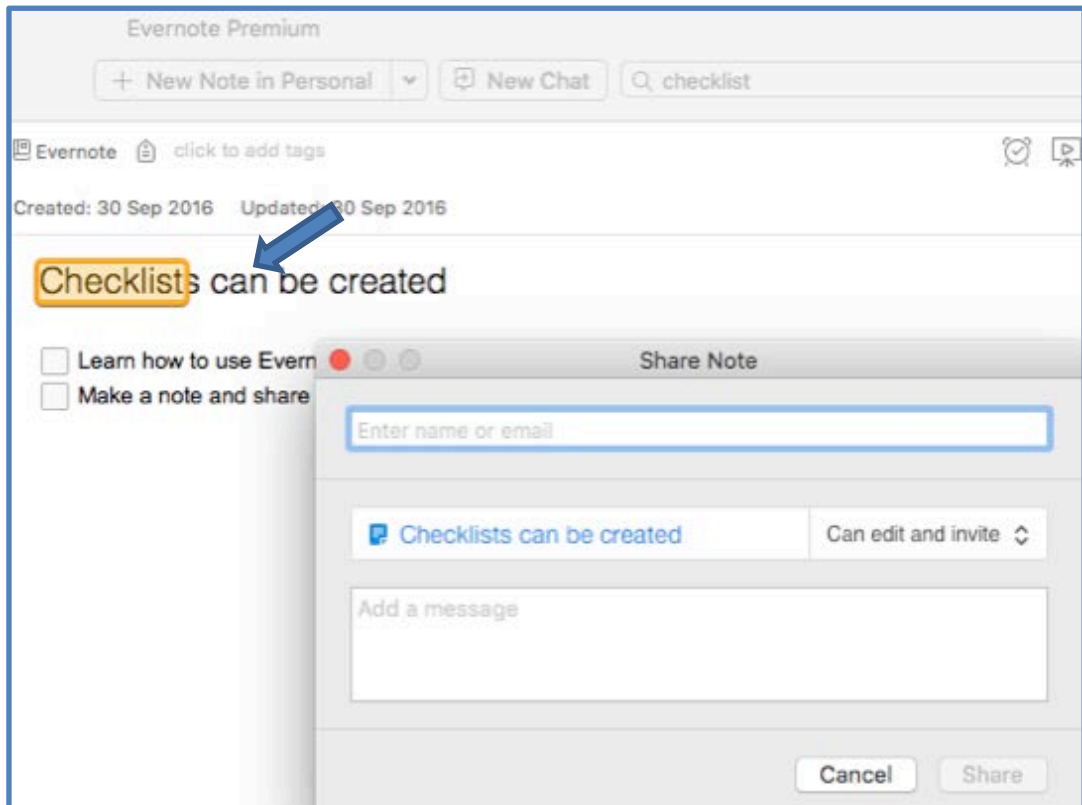
Figure 3.7: Creating and sharing notebooks

Evernote as a DD

Evernote was chosen because it has a range of features that make it an ideal platform to use as a DD. The following section will justify the researcher's reasons for choosing Evernote.

Accessibility features: The first reason for choosing Evernote was its accessibility across multiple devices. For the innovation, this would mean every participant would be able to access the application, irrespective of what digital device they used. Having the ability to access an Evernote folder on a range of devices would provide greater access for parents, teachers and children (McNally, 2014). Having a DD hosted though Evernote also removed the need for children to physically transport PDs between home and school, which then removed the chances of them being left at home.

Multimedia options: The second reason for choosing Evernote was because it could support a range of multimedia. Notes added by the user could be written, voice recorded or photographed and attachments could be added. In a study carried out by Heejeong, Messom and Yau (2013), the multimodal feature was one of the key reasons for schools considering the use of digital textbooks rather than paper copies.

Privacy: The third reason for choosing Evernote was because of the privacy features offered. Users are initially required to create an Evernote account with a username and password. These details are then required to log into the Evernote account on any device. To join a folder within Evernote, a user needs to be invited by the person who created the folder.

Data protection: The fourth reason for choosing Evernote was because of its data protection protocols, titled Three Laws of data protection and detailed on the application's blog (Libin, 2011). These laws clearly state that any data entered belongs to the account owner; the data is protected through encryption and kept private at all times. Also, the stored data can be transferred easily out of Evernote at any time. For the context in which Evernote was trialled, a folder was created for each child and shared with each corresponding parent. Only the teachers and parents of the child had access to the child's folder.

Educational context: The fifth reason for choosing Evernote was that is has been successfully used in an educational context previously. Although limited research had been carried out on the use of Evernote in education, one piece of research carried out the evaluation of different smartphone apps to facilitate *geotagging* of photographs in Geography (Welsh et al., 2012). Evernote was considered in this context, along with two other applications. In this study, the benefits of Evernote included its widespread use, the support available to users and its free availability.

Intuitiveness: The sixth reason for choosing Evernote was that is has been used successfully as a collaborative tool in a range of contexts since 2006 and continually receives excellent reviews from its users. It is regarded as an intuitive tool, even for people who aren't familiar with tablet applications. Evernote also operates a 24-7 helpline that people can call if they have problems.

Efficiency: Finally in her assessment of Evernote, McNally (2014) believes it is an ideal tool to use in schools as it enables different types of data to be stored in a variety of ways and be easily retrieved at a later date. As an example, for collaboration purposes, folders can be created within the program and shared with others. Additionally, data can be sorted into individual folders and tags can be added to notes to aid their retrieval later (McNally, 2014). This would allow teachers to tag according to subject areas, learning objectives and goals being worked upon, which would make it easy to collate the data at a later stage.

With its easy organisational features, online accessibility and data protection management, Evernote showed great potential as a communication and collaborative tool (McNally, 2014). Users only needed basic knowledge of this software before using it. Additionally, Evernote is an application that can be accessed from any device and at any time of day. Also, it enables ideas to be shared using a variety of modes, which could prove beneficial to the home-school communication process for parents and teachers of children with AN.

Stages of the Research

The stages of research are summarised in Figure 3.8 below and described in the following section:

Stage	Date	Research event
1	Early August 2014	Ethics approval
2	Early August 2014	Pilot study
3	Mid-August 2014	Permissions
4	End August 2014	Paper diaries collected
5	End August/ Early September 2014	Questionnaires and pre-interviews
6	Early September 2014	Information sessions
7	Early September-Mid November 2014	Digital diary innovation
8	End November-Early December 2014	Post innovation interviews
9	January-December 2015	Maternity leave
10	January- June 2016	Analysis of data
11	July 2016- July 2017	Thesis write-up
12	August 2017	Thesis submission

Figure 3.8: Overview of the stages of research

Stage One: Ethics

Following the acceptance of the proposal, an ethics application was made to Edith Cowan University. This was successful and the researcher was given ethics approval to conduct the study at Gosmere School.

Stage Two: Pilot study

The research instruments developed for data collection were piloted to ensure questions were comprehensive, relevant, and would collect the data required to answer the research questions (Bell, 2010). The trial group identified to pilot the research instruments consisted of two teachers and two parents from a similar catchment area to the study school, thereby reflecting the participants of the study (Bell, 2010; McMurray, 2004). The teachers had a mix of experience and had taught at schools in a high socio-economic area. Both were teachers of children with AN. The parents also lived in a high socio-economic area and children of school age. Unfortunately, it was not possible to use parents of children with AN for the pilot study. The questionnaires were also included in the pilot study and again, these were discussed with the pilot participants to ensure they would collect the relevant information to answer the research questions.

As the participants worked through the questionnaire and interview, they were asked to articulate their thoughts and observations to provide feedback to the researcher (Bell, 2010). Following the pilot study, some alterations were made to the questionnaire, but the interviews remained unchanged.

Stage Three: Permissions

The research focused on the parents and teachers of primary school children with AN at the study school. Following ethics approval, a letter was sent to the Principal, introducing the researcher, explaining the purpose of the study and requesting permission to undertake research at the school. Once permission was granted from the Principal, the Special Needs Coordinator was contacted and a meeting arranged. At the meeting, an overview of the study was discussed and potential candidates were identified against the following criteria: the child needed be of primary school age and had to have an AN requiring withdrawal from their mainstream class for extra support. As the teachers had previously agreed to take part in the research, the next step was to identify eight sets of parents of children with AN who would be willing to participate in the study. While six parent sets were

assessed as sufficient to create a meaningful multiple case study, the researcher sought to identify eight participant sets on the assumption that participants could withdraw from the DDI at any time. Two documents were sent home to each of the parents of the children who met the agreed criteria. The first document provided an outline of the research, detailed the expectations of the participants through the study and participants' rights and responsibilities. While this was not compulsory, Bell (2010) suggests participants should have a chance to access this information privately so they have time to ask any questions they may have. The second document was the consent form, which was required to be signed and returned to the researcher. Ten sets of participants were finally used for the research; parents (n = 10) and teachers (n = 8), two of whom had two children with AN in their class.

Stage Four: Paper diaries

After permission had been obtained from teachers and parents, PDs were collected from the children in the study and copies made ready to be analysed. As the DD were going to be trialled during Terms 3 and 4, the focus of the PDs was Term 2. One of the 10 PDs was missing and was not able to be located during the data collection period.

Stage Five: Questionnaires and pre-interviews

Prior to the start of the innovation, teachers and parents were asked to complete a questionnaire and partake in a pre-innovation interview. Bell (2010) recommends presenting questionnaires in person, rather than over the telephone or via email, as evidence has shown there is a much higher chance of people completing the questionnaires when they are presented in person. All the questionnaires were completed by the teachers and parents and returned to the researcher prior to the start of the interview. The pre-innovation interviews were conducted with teachers over the course of a non-pupil day, so they had time to attend and all the interviews could be completed in one day. The parents who had nominated their interest to be

part of the study were contacted via email to arrange a convenient time to meet. The times selected by the parents included before school, after school and during the school day.   During this time, the researcher had flexibility with their own employment and could therefore work around the participants.

The withdrawal room where the Special Needs Coordinator worked with children was used for the interviews. This was a room familiar to all the teachers and parents and was in a quiet area of the school, which allowed for greater privacy. The interview room was not used during the non-pupil day when the teachers were interviewed, which made the day easy to organise. For the parents, interview times were offered when the room was not timetabled to be used, to ensure there was no disruption caused to the Special Needs Coordinator and the children being withdrawn for their specialised lessons. Parents were also given an option to be interviewed at home or at another place; however, all chose to be interviewed at school.

The pre-innovation interviews were anticipated to last for approximately 20 minutes, with a 10 minute break after, to allow for more discussion time if required. Having these breaks between interviews meant most of the interviews were conducted at the allocated time and none of the teachers or parents were kept waiting, thereby causing no extra inconvenience to them. The teachers and parents were asked to bring their completed questionnaires with them and these were collected before the interviews started. Prior to starting the interviews, the purpose of the study was explained again and participants were given the chance to ask further questions. Emphasis was placed on the fact that the data collected would remain anonymous and participants could withdraw at any time during the data collection period.

An iPad and iPod were used to record the interviews for transcribing later. Two devices were used so one could be used as back up if one stopped working. The participants were told about the recording devices and checks were made to ensure

they were happy to be recorded. Once the interviewing began, the questions were worked through sequentially and the researcher made extra notes to refer back to if needed. Further questions were asked if the researcher did not feel a question had been answered fully. Once the interview had finished, the participant was thanked and provided with the date, time and location of the information session to be held the following week.

Stage Six: Information sessions

When discussing the information session with the Special Needs Coordinator, it was agreed that a separate session should be held for the teachers and parents. The teachers felt they would be more comfortable learning about Evernote and asking questions if the parents were not present. Both information sessions were held after school on different days in one week.

The information session was provided in a classroom, with refreshments, and was 40 minutes in duration. The classroom had an interactive whiteboard with an iPad connection so the iPad could be displayed clearly on the board for everyone to see. At the information session, a presentation was given about the impact of home-school communication on a child's learning outcomes, according to the research. The presentation used at the information sessions has been included in the appendices. The participants were reminded about the reasons for the study and the ways in which the data was going to be collected. Bell (2010) claims sharing this information from the start enhances success. Following this, the participants were introduced to Evernote. Prior to the information session, EN Notebooks had been created for each of the children and invitations for the parents and teacher of each child sent via email, inviting the parents and teachers to join their EN Notebook. During the presentation, an overview of Evernote was provided, and participants were stepped through how to use the application. This part of the session included a practical element where participants were given the chance to explore Evernote for themselves. The content covered the layout of Evernote, including EN Notebooks, how data was stored and

shared and the type of data that could be uploaded to the application. The researcher then demonstrated how to use different features of Evernote and encouraged participants to practice using the different features. Features covered included creating EN Notes, adding titles to EN Notes, uploading photographs to EN Notes, adding EN Checklists to EN Notes and ticking off EN Checklists in an EN Note.

A discussion then took place on how these features could be used to support the home-school communication process and the researcher answered questions. During both information sessions, there was a feeling of apprehension from some of the participants who lacked knowledge and confidence in the use of mobile digital devices. To support these people, the researcher spent additional time with those who requested help during the practical element of the session. There were also many feelings of excitement at the information that could be provided to parents and teachers using Evernote as a DD.

All the teachers and parents participated during the practical element and the researcher supported many of the participants with downloading Evernote onto their personal mobile digital devices and logging in. At the end of the session, the researcher summarised what had been covered during the session and what the researcher was hoping to achieve with the study. Teachers and parents were reminded that the researcher could be contacted via email or phone if they had any questions or issues during the DDI.

Stage Seven: Digital diary innovation

The DDI began the following week and ran for eight weeks. During this time, the researcher visited the school and the teachers at least once a week. If someone emailed for help, the researcher made a time to visit that was convenient for the participant. This happened several times during the DDI. Each time the researcher visited the classrooms; participants had a variety of questions including issues with their mobile digital devices and questions about Evernote. The common questions

asked were in relation to issues about the mobile digital devices; including charging the iPad, and children forgetting to take their iPads home. Questions relating to Evernote were primarily focused on where content was supposed to be saved and clarifications on what to use the DD for.

To ensure continued use of the DD throughout the innovation, an extra session was arranged for teachers approximately halfway through the trial to try and reinvigorate the DDI, for those participants who had stopped using the DD. During this session, further questions were answered, key uses of the DD were revisited and some of the DDs were looked at to demonstrate how different people had been using the DD. Teachers were also shown how to incorporate video into the DD. Following this session, some of the participants' use of the DD increased.

Email was mainly used as the communication mode between participants and the researcher. A WIKI had been considered to support participants during the DDI; however, as several participants shared their lack of ICT knowledge and confidence in the questionnaires and pre-innovation interviews, it was felt this would create more work for participants.

Stage Eight: Post innovation interviews

At the end of the DDI, post innovation interviews were held with the teachers and parents to learn about their perspectives on the DD. The interviews were mostly conducted in the same way and place as the pre-innovation interviews, except for one teacher and one parent. One parent asked to be interviewed in her home, as she was not able to get to school during that week. The teacher, who had not shown much interest in the innovation and had been off sick during the latter stages of the innovation, did not want to meet or talk on the phone. Instead her answers to the questions were provided via email. Unfortunately, this did not give the researcher the option to ask any additional information about the answers provided. Most of the participants were happy to meet and had a lot to discuss, regarding the DDI. The post

innovation interviews again took approximately 20 minutes per person and these were recorded using the iPad and iPod, to ensure the data collected was backed up, and were then transcribed by an external contractor.

Stage Nine: Analysis of data

This study was focused on data collected using qualitative methods, with a small amount of quantitative data. The qualitative data included pre-and post innovation interviews, paper and digital diaries, and emails between teachers and parents during the DDI. Each of these data sources was coded and then sorted into themes based around home-school communication. The purpose of the quantitative questionnaires was to find out information about the participants' use of ICT, basic thoughts on home-school communication and socio-economic background.

Data Analysis

Creswell's (2009) commonly used Six Step approach for qualitative data analysis was selected for the study. The steps, in the context of the data collected, are described in the following sections.

Step 1: Prepare the data

Interviews: The interview recordings were sent to an external agency to be transcribed. These were then emailed back to the researcher in a word format so the researcher could begin to make notes on the transcripts.

Questionnaires: The data from the questionnaires was put into a table, first showing individual answers from participants and then showing an overview of the entries made.

Paper diaries and digital diaries: A table was used to record data from the PDs. To answer the research questions, specific data needed to be extracted from the diaries to ensure the differences between the paper and digital diary could be discussed effectively. The analysis needed to include who the contributor was (parent, teacher or child) and the way in which the recording had been completed (handwriting or other). Additionally, the key reasons for the diary entry needed to be recorded (signature of acknowledgement, homework, learning). The last area would need revisiting to conduct further analysis to draw out the key themes that corresponded to the data from the interviews. A separate table was then created for each PD and then a collective table was created to enable comparisons between the diaries.

Similarly to the PD, a table was used to record data from the DD. Again, the analysis included who the contributor was (parent, teacher or child), the way in which the recording had been completed and the content shared. For the DD, the entries extended to photographs, videos and checklists. Additionally, the primary reason for the diary entry needed to be recorded to help identify common trends. A collective table was then created to enable comparisons to be made between the DDs.

Following the creation of two separate tables to show an overview of the paper and digital diary entries, a table was created allowing for the PD content to be analysed alongside the DD content. This would allow for comparisons to be made between the paper and digital diary later.

Step 2: Read through the data

Once all the data was organised in an easy to read format, the researcher read through all the data (Creswell, 2009). This enabled the researcher to gain an overall understanding of the participants' perspectives (Collins, 2010).

Interviews: The transcripts were read through, starting with the pre-innovation interview transcripts and continuing onto the post innovation interview transcripts.

Questionnaires: The questionnaire outcomes were read several times and the paper and digital diary entries were read through. This enabled the researcher to begin thinking about the data collected and its underlying ideas. Responses from the questionnaires and interviews were looked at in detail and thought about in relation to possible themes. Links were also between cases and the information learnt about them through the questionnaires.

Paper and digital diaries: As the researcher read though the paper and digital diaries, she began thinking about the key areas that had been recorded, in relation to the data collected in the interviews and questionnaires (Denscombe, 2003). As the researcher thought of potential key ideas that were covered in the data, notes were made for later analysis (Creswell, 2009).

Step 3: Coding the data

Once the researcher had read through the data several times, the coding process commenced. Initial ideas were assigned different colours and the researcher worked through the data, highlighting sentences and phrases in the relevant colours. The ideas highlighted related to the what aspects participants wanted from communication, features of the DD that were shown to make a difference to the communication process and what these features enabled the participants to do more effectively (McMurray, 2004). Bell advises researchers to: "Look for similarities, groupings, clusters, categories and items of particular significance" (2010). Extensive time was spent categorising the types of entries in the paper and digital diaries and then cross-comparing these with the interview responses.

Step 4: Plan description of the cases

After coding the data, and in line with the case study approach, the researcher planned a description of each case (Creswell, 2009). These descriptions used key

ideas that started to form from the commencement of data analysis and key participant quotes. Next, the researcher carried out a, "systematic examination of similarities between cases to develop concepts or ideas" (Punch, 2005, p. 196). As this analysis was conducted, key themes began to emerge from the data. This process is what Yin describes as: "working your data from the 'ground up'" (Yin, 2014, p. 136). From looking across all the data sources, it was clear some of the initial ideas had changed and were therefore modified as the analysis progressed.

Step 5: Plan discussion of the themes

Once the key themes had been established using the different data sources, the researcher was able to map out the themes with their subsections and analyse these linkages with key quotes and ideas. Based on the research questions, the focus was on home-school communication using first the PD and then the DD.

The themes were developed for the individual case studies and then the cross-case analysis. The researcher felt it was important to summarise each separate case, as reactions to the DD varied significantly between cases. Some cases responded positively to the DD and showed how beneficial this tool could be for home-school communication.   Other cases did not respond as positively due to other considerations; however, there were other interesting details to emerge from these cases that created a need for further discussion. Once the individual cases had been summarised, the overriding themes clearly emerged and these formed the basis of the cross-case analysis for all 10 case studies.

Step 6: Investigate links between findings and literature

Once the themes had been established and summarised from the perspectives of the 10 cases, the researcher then revisited the literature review and examined the data. This enabled the researcher to find similarities and differences between the findings and the key themes that had arisen from the literature review.

Reliability and Validity

Prior to the data collection period, the questionnaires and interview questions were piloted with participants from similar backgrounds to the intended population. Responses from the pilot group determined if the instruments would contribute towards answering the research questions and contained no ambiguities that may have confused the participants. Bell (2010) states that this helps test the methods for their reliability. During the pilot study, the researcher's aims were shared with the pilot group participants. Feedback was sought on whether the aims of the study would be achieved through the questions used. Although this is described by Bell (2010) as being a, "rough-and-ready method" (p. 120), she claims this method can be effective in ensuring questions have been carefully constructed and are both reliable and valid. The pilot study was not used to collect data but to test the research instruments in preparation for the study. Additionally, the interviews, questionnaires and diaries enabled the data to be triangulated, which in turn helped to validate the data (Creswell, 2009; Denscombe, 2003).

In the findings and discussion write-ups, the researcher has provided data that did not fit in with some of themes. Creswell (2009) suggests: "By presenting this contradictory evidence, the account becomes more realistic and hence valid" (p. 192).

Bias

It was important to minimise or reduce bias during the data collection process. This is of particular importance when the researcher is personally involved in the research. As Selltiz, Wrightsman and Cook (1976, p. 570) state: "interviewers are human beings and not machines, and that that they do not all work identically or infallibly". This was of particular importance during this study as the researcher has worked in this field for many years and so could sympathise with the experiences of the teachers and the parents. However, Gray (cited in Bell, 2010, p. 169) advises: "it

was her constant questioning of practice and her critical attitude towards the interpretation of data which helped her to recognize signs of bias – and it is this kind of discipline which is required". The researcher worked to adopt this approach throughout the data collection process, as well as the data analysis stage. To ensure the participants' responses were interpreted accurately, the interviews were transcribed and then read carefully several times. Bell also explains how triangulating the data also helps to overcome any bias, which may have come from the researcher (Bell, 2010). Therefore, the researcher constantly referred between data from the diaries, interviews and questionnaires to ensure no bias in the data analysis.

Ethical Considerations

Before beginning the data collection, the case study school was presented with an overview of the research project and a request for an, "agreement in principle" (Bell, 2010, p. 53). Ethics approval was then sought from the University to ensure the data being collected adhered to the appropriate protocols and policies (Bell, 2010). From the sample population, participants were invited to take part in the research and informed consent was given by the participants prior to start of the data collection process (Bell, 2010). The importance of informed consent was emphasised in the literature by many researchers, and prior to asking the participants to sign consent forms, participants were fully informed of the purpose of the research, the type of data required, the time commitment and what would happen to the data afterwards (Creswell, 2009; O'Leary, 2010). It was reiterated that participation was purely voluntary and participants were informed of their right to withdraw from the research at any stage (Creswell, 2009; McMurray, 2004).

During the data collection process, the time and place of meetings and interviews were scheduled to suit the participants. As Punch (2000, p. 59) explains: "since researchers cannot demand access to people, situations or data for research purposes, assistance and permission are involved".

The information shared via the DD was sensitive in nature, as it contained descriptions of children, photographs and videos. When meeting with the school prior to the information night, a discussion took place to develop shared expectations to ensure this data was kept confidential. Points covered included:

- Persons who can access the information;
- Access requirements for the information;
- The type of information to be shared and
- Any video and photograph restrictions.

It was emphasised the focus of the data sharing was to share positive stories, teaching strategies that have been applied successfully at school and other gains made, both at home and at school. Therefore, sensitive information was still to be shared through existing communication paths, such as the telephone or in person. During the innovation period, the use of the DDs was closely monitored and it was made clear to parents and teachers that they had the option to return to the previous communication system at any time. O'Leary (2010) stresses the importance of maintaining confidentially at all times, and for some situations, anonymity. To ensure the participants remained confidential, letters were given to replace their names so only the researcher knew the identification of each participant (Creswell, 2009; Yin, 2014). After the innovation period, participants were de-invited from the DDs. The data was downloaded and is currently being stored on hard drives in the researcher's office until it is no longer required, upon which time it will be destroyed.

This section discussed the methodology used for the study. To begin, a context for the study was provided followed by a justification for choosing a qualitative study using a multiple case study approach. An overview of the participants in the study was provided with a breakdown of the teachers and parents who made up each case study. The next part of this section looked at Evernote as a tool to support home-school communication. An overview of the basic functions was

provided and a justification for why Evernote was chosen as the application to try as a DD, through a description of the outline of the features. An outline of the stages or research was discussed, demonstrating how each stage built on the previous stage. Following this, an analysis of the methods used for data collection was discussed, with the advantages and disadvantages of each method considered with relation to the questionnaires, interviews and the paper and digital diaries. After, an explanation was provided of how the data were analysed. Finally, issues of reliability and validity, minimisation of bias and ethical considerations were discussed.

CHAPTER FOUR: FINDINGS

In this chapter, findings from the data will be discussed under the key themes that emerged from the data analysis. The data collected from the parents and teachers was qualitative and included pre-and post innovation interviews, pre-innovation questionnaires, paper and digital diaries.

The chapter will begin by providing an overview of each of the 10 case studies. Following this, the parent and teacher requirements for home-school communication will be discussed followed by the four key themes to emerge from the data. These themes were *being informed*, *collaboration*, *child involvement* and *parental engagement* and will be used to discuss the differences between the paper diary (PD) and digital diary (DD). The final section in the chapter discusses the challenges of the DD, as shared by the participants of the digital diary innovation (DDI).

Ten Case Studies

Case study A

PA was in the 40-49 age group. She was married or in a de facto relationship and had three children aged 16 or under living at home. She usually worked 30 hours per week at her job. PA owned a smart phone and had one computer and tablet at home. She spent less than one hour a day on the Internet and used technology for a range of tasks, including emailing, entertaining and word processing. In the pre-innovation questionnaire, PA indicated she was not happy with the level of home-school communication and expressed a desire to receive more feedback from the teacher. Her preferred method of communication was the telephone.

TA was in the 40-49 age range. She owned a smart phone and had one computer and a tablet at home. She also used technology for a range of tasks, including emailing, online shopping and entertainment. Similarly, to PA, TA spent less

than an hour a day on the Internet. TA expressed a need for receiving more communication from home. Her preferred mode of communication was email.

PA felt home-school communication was extremely important as it enabled her to provide more support with schoolwork and ensure her child was organised for each school day. As she explained:

so the child feels as though they're getting reinforced, whatever's happening at school or whatever's happening is being reinforced. And they can … it helps them to plan better and to manage their own workloads better and their own school education (Pre-interview, August 2014).

During the pre-innovation interview, PA expressed frustration at not receiving enough information to engage in her child's learning. She received weekly information via the school's WIVERN, an online tool which showed generic information about activities during the week, as well as a weekly overview of the class celebration. However, PA wanted more personalised information relating to her child's learning that could be used support her child with the two aspects her child struggled most with; keeping up to date with classwork, and being organised. PA rarely had access to the PD.

TA also spoke about the importance of home-school communication and felt it was essential in enabling the parent and teacher to work together with the child. Likewise, she discussed the positive impact of home-school communication in enabling parents to fully support their child with ongoing work at home:

So important for us that if we're giving out additional work or work that needs to be finished at home, parents are aware of that and can actually assist with the children at home to get that completed in a timely fashion and to get it

back to us otherwise it will then impact on the learning and of course their academic performance and ratings as well (Pre-interview, August 2014).

PA was very positive when asked about the idea of using a DD for communication. She felt it could support her child with organisation, as well as providing an efficient way for the parent to access the teacher:

being able to access it so we would be able to access, log in somehow as well. But also to be able to post comments that then maybe the teacher could see or to ask questions that the teacher could answer. It would make the world of difference for her. Particularly with her struggles with recording, writing things down (Pre-interview, September 2014).

TA expressed a preference for communicating via technology from the outset. Her primary reason was it enabled better access for the child, teacher and parent. Therefore, she was very enthusiastic about the idea of trialling a DD for communication. During her interview, TA identified other advantages for using technology to communicate, including the ability to store schoolwork and related communication on one device:

Well depending on how robust the program is, it could also link into different subject areas where different assignments could be placed on it, electronic versions, copies of assignments. Feedback could be send directly through it to parents (Pre-interview, August 2014).

Both participants attended the pre-innovation information sessions and showed enthusiasm in trialling the DD as a communication tool. TA demonstrated confidence in the use of ICT and although she had not used Evernote before, showed to have a good understanding of the basic use of the software by the end of the information session. Although PA showed less confidence in the use of Evernote, she

showed a willingness to learn and be part of this new communication process with the teacher.

Case study B

Both parents attended the pre-innovation interview and completed the pre-innovation questionnaire. However, only one parent took part in the rest of the innovation. PPB were in the 30-39 and 40-49 age groups. They were married or in a de facto relationship and had two children under the age of 16. Both parents usually worked 50 hours a week at their jobs. PPB owned smart phones and had two computers, as well as three tablets in their home environment. They used the Internet between one to three hours per day; predominantly for emailing, online shopping, social networking and reading the news and education sections. PPB indicated that they were happy with the level of home-school communication. Their preferred method for contacting the school was face-to-face, however they preferred receiving communication via email or the PD.

TB was in the 40-49 age group. She owned a smart phone and had two computers at home. She indicated that she used the Internet for less than an hour a day; primarily for emailing and reading the news and education sections. TB was happy with the level of home-school communication and preferred to use the PD for sending and receiving information between home and school.

PPB felt home-school communication was essential for children with AN. They explained how their child needed extra support in many areas of learning, and therefore, how important it was that all the teachers worked together. As they shared:

> they [teachers] communicate with the OT, the OT tells them what she wants
>
> them to work on, vice versa. If they don't agree, you know. So there's that nice

communication and give and take of what everyone needs her to work on. And then I get my part and I give my input (Pre-interview, September 2014).

PPB felt they were listened to and were provided with clear communication about their child's progress. Additionally, home-school communication had shown to make a difference to their child's learning, as when PPB were given strategies from the teacher to use with the child's reading, these strategies had proven successful at home.

PPB liked that the home-school communication was very personal and showed a deep level of care about their child. As they shared:

There's a genuine interest in CB or any of the girls really. The teachers really do have a good understanding of who they are and what their strengths are and what their weaknesses are. And that's a nice feeling. And they kind of can gauge that quite quickly and they have gauged that quite quickly (Pre-interview, September 2014).

A particular area commented on was that PPB enjoyed being able to go into their child's class in the mornings and look at work that had been completed by their child.

TB felt home-school communication was extremely important for children with AN to ensure consistency between home and school, and to aid a collaborative approach towards the child's learning and development. TB held frequent meetings with the parents of children with AN in her class and often saw mum prior to the start of the school day to get a general idea on how the day was going for the child:

it's just that general thumbs up, thumbs down in terms of how she's going. Which isn't enough, it's not a meaty conversation but little things like that just

to say whether she's had a rough day in terms of her sleep and focus and medication and things like that (Pre-interview, August 2014).

TB felt a positive aspect of effective home-school communication was that parents knew how their child was progressing and there are no surprises when reports are sent home:

they've been on the same track as us, we've had constant meetings, they know that they're not making benchmark, they know they're on their own IEPs. They know where they need to go and the fact that they're unfortunately not achieving what they should be for their age (Pre-interview, August 2014).

When the TB was asked about the disadvantages of using paper diaries, she expressed the desire to be able to send photos and video home:

Photos I think, probably put photos, show them … I'd love to video; I'd love to be able … I'd love to video the girls and have them doing something amazing in class and just see them participating in one of our activities and be able to flick that through or … and that again can't be done in the diaries (Pre-interview, August 2014).

When asked about their thoughts on using a DD, the parents felt it was how things were developing and as many people were not using technology regularly, it was inevitable that a digital platform was used for home-school communication. PPB talked about regularly checking emails so they would see as soon as one was sent from school, whereas they admitted to rarely checking the paper diary.

When asked about her thoughts on a DD, TB was also extremely positive. She felt it would be useful as it would then provide a *"record of communication. You could … you've got history that you can pass on to future teachers. A tool for parents*

as well" (Pre-interview, August 2014). TB also saw for potential for children recording their own learning journey.

PB and TB attended the information sessions and TB seemed particularly enthusiastic about the DDI. PB showed reservations, although she had a good understanding of technology and used her smart phone on a regular basis. Over the period of the innovation, it should be noted that the teacher worked hard to communicate via the DD; however, the parent stopped using the DD after the initial few weeks of the DDI, and reverted back to using the PD for communication purposes.

Case study C

PC was in the 40-49 age group. She was married or in a de facto relationship and had two children under the age of 16 at home. She worked for 20 hours per week at her job. PC owned a smart phone and had two computers and three tablets at home. She used the Internet for between one and three hours per day; mainly for emailing, entertainment, social networking and reading news and education. PC indicated that she was happy with the level of communication between home and school and her preferred method of communication was email.

TC was in the 30-39 age group. She had a smart phone and owned one computer, as well as using a work computer regularly. TC accessed the Internet for less than an hour per day; mainly for emailing, online shopping, social networking, word processing and reading about news and education. PC indicated that she was happy with the level of communication between home and school and preferred to use email for home-school communication.

PC felt the purpose of home-school communication was to reassure parents that the child was achieving the expected outcomes at school, as well as providing reassurance relating to the wellbeing of the child. Additionally, PC discussed the

importance of home-school communication in enabling her to support her child at home. She felt this was an essential aspect of home-school communication for children with AN:

I think the kids stay so busy that, and there's so many demands on them socially, as well as academically, that in order to back up what's being done at school we need to know what they're working on so you can at least discuss it over dinner or have some inkling of what's going on so you can back it up (Pre-interview, September 2014).

TC also felt the purpose of home-school communication was to inform parents about the child's current learning in the classroom so parents could provide extra support at home. She thought home-school communication was particularly important for children with AN as they often had more complex educational needs that needed to be supported:

Because they've got extra things that we have to cater for and deal with and we need to know if there's things that are changing with them at home or what they're working on at home, or if there's things that are worrying them, stressing them out, that sort of thing (Pre-interview, August 2014).

A communication challenge experienced by TC was ensuring parents received enough information so they had a clear understanding of the level their child was working at. This was of particular concern when reports were sent home, as parents may have expected their child to have achieved more than they actually had.

This challenge was also discussed by PC, as she felt she did not receive a clear idea of her child's daily learning. Although PC received an overview of the term's learning along with the child's IEP goals, she did not always have a clear idea about her child's day to day learning and so she felt she was not able to provide additional

support as well as she wanted to. Part of the reason for this was because of the different teachers teaching her child during the school week:

I'm unsure as to exactly what is being worked on at that particular point in time. Because she's got a couple of different literacy support and numeracy support teachers. So I suppose I can ask but it would be actually nice to have that this week we're working on or in the next four weeks we're going to be working on X, Y, Z so I can back that up at home (Pre-interview, September 2014).

A second communication challenge was tardy feedback sometimes received from different teachers. This left PC feeling frustrated.

When discussing possible positives of a DD, PC felt that as teachers checked their emails more regularly, a quicker response was often received. This was in contrast to the paper diaries which:

only get looked at once a day. So you wait for it to come home, you remember to write it in and then it goes to school the next day, it's the next night before you might get a response to it (Pre-interview, September 2014).

TC discussed how the paper diary did not allow for changes to be made very easily and felt the use of electronic methods would enable more efficient changes that could synchronize across all devices.

Both participants attended the information session and showed a willingness to be involved in the DDI. They both embraced the DD as the main communication method during the DDI.

Case study D

PD was in the 40-49 age group. She was married or in a de facto relationship and had two children under the age of 16. She was a full-time homemaker. PD had a smart phone, one computer and one tablet in her home. She used the Internet for between one and three hours per day; for emailing, online shopping, entertainment, social networking, word processing and reading news and education. PD indicated that she was happy with the level of communication between home and school and preferred using email for home-school communication.

TD was in the 40-49 age group. She owned a smart phone and one computer. She spent more than three hours a day on the Internet and used it mainly for emailing, social networking, word processing, reading news and education along with completing school based work. TD was mostly happy with the level of communication between home and school; however, expressed how she would like to receive more communication from some of her parents and less communication from others. Her preferred method for contacting home was email but she did not indicate a preference for receiving communication from home.

PD felt home-school communication was extremely important as it helped everyone work together to achieve shared goals for the child. She also felt it was important for teachers to find out approaches that have been successful in the past:

> *her spelling has to be probably … presents itself a little bit differently and CD needs repetition, repetition, repetition. Repetition goes into her long-term memory, she's got it. Until the next thing. And I don't know whether all children learn like that, I'm not quite sure, but with CD that's what works best with her* (Pre-interview, September 2014).

Although PD had indicated in the questionnaire that she was happy with the current level of communication, during the interview she expressed her frustration with not learning enough about the positive outcomes of her child. As she stated: *"it would be nice to celebrate it a little bit more. Especially when you've got a child who … has some additional needs. It would be nice to celebrate it a little bit when something goes well"* (Pre-interview, September 2014).

TD felt home-school communication was particularly important for children with AN as these parents tended to be more concerned about their child's needs being met in the classroom. As she shared: "*Because there's probably a degree of anxiety there, I think, in terms of my daughter being at level and keeping up. And also, that her needs are being met because she has a lot of intervention"* (Pre-interview, August 2014).

PD did not respond positively to the idea of using a DD for communication prior to the DDI. She was not sure if it would make communication any more efficient, however felt she could adapt if this was chosen as the main communication method. As she shared: *"I suppose, it's like anything, I use an electronic diary and I find it okay. It's just getting used to changing the way you're doing things. You get stuck in your ways"* (Pre-interview, September 2014). PD was also hesitant about the DDI for her child as she was concerned about her child looking different to her peers. As she explained: *"I know my child wouldn't like it if she's the only one using that and nobody … because she doesn't like to be different. So I'm not sure for my child"* (Pre-interview, September 2014)*.* TD did not have any prior thoughts about the use of a DD for communication.

Both participants attended the information session. However, neither the parent nor the teacher explored the DD fully during the DDI.

Case study G

PG was in the 30-39 age group. She was married or in a de facto relationship and had four or more children under 16 at home. She worked seven hours per week. PG had a smart phone, along with one computer and four tablets at home. She used the Internet between one and three hours each day and regularly used it for emailing, online shopping, social networking and reading news and education. PG was happy with the current level of communication between home and school and preferred email or text messaging as the mode of home-school communication.

TG was in the 30-39 age group and owned a smart phone. She had three computers and two tablets at home. TG used the Internet between one and three hours each day; primarily for emailing, online shopping, entertainment, word processing and news and education. TG was happy with the level of communication between home and school and preferred email as the main mode of home-school communication.

PG felt communication was essential for her child because of additional difficulties experienced during the school day and the need to support her child with learning at home. As her child received extra support at home from two tutors, the parent stressed the need for everybody to be working together in order to maximise the learning for the child:

> *you need to make sure everyone that's assisting CG is on the same page, and the only way you can do that is with regular communication. Otherwise it's too confusing for CG if the tutor is working on one sound and the school's doing another sound and I'm, I don't know, doing something else. We all need to know what the theme for that week is so we can all tackle it, I guess, at the same time* (Pre-interview, September 2014).

In particular, PG felt parents of children with AN needed to be more proactive with communication as they invariably required more support, which if not provided, could lead to negative outcomes:

But I just think when your child's got additional needs, you need to be more proactive and you need a lot more feedback because things can go downhill very quickly. Yeah. You need almost, yeah, daily contact I guess, which with normal kids you don't (Pre-interview, September 2014).

Although PG had recorded in her questionnaire that she was satisfied with the level of communication received from the school, during her interview, she shared her constant worry that her child was not having a good day. PG also discussed the lack of information received from school, as her child did not often remember or want to share information with the parent:

For instance, I like to know how CG's done in her spelling test because she's dyslexic. And that's on a Friday and I'll ask CG and she'll be, like, 'I don't know.' Even though she's done it and probably does know (Pre-interview, September 2014).

TG believed the purpose of home-school communication was so parents were kept up to date with the child's learning and to ensure parents knew how they could support their child, as well as letting the parent know how the child is going from day to day. As she stated:

the purpose is just to let them have an opening into the classroom, pretty much, so the door's always open and so they can see what's happening in the classroom, what our goals are, what we're going to achieve, how they can help their child reach their learning goals alongside with what the teacher's wanting to do (Pre-interview, August 2014).

Although TG felt more generic communication should only be shared once a week, she believed more personalised information about the child should happen more frequently. TG frequently shared information with the parents but rarely received anything back from them, as she shared: *"It would be lovely to have things coming back from parents as well. Sometimes you're putting out all this stuff and wondering if anyone's ever listening to it or reading it"* (Pre-interview, August 2014).

When asked about the importance of home-school communication for children with AN, TG believed it to be extremely important, as she explained:

The parents of children with additional needs have so much stress, additional stress to a normal parent who's raising a child without those issues. To alleviate some of that stress and worry about their child, then you know you're doing the right thing if they're a little bit more confident in letting their child be with you for the whole day, trusting you and knowing they'll get that information back. That's what they need to function because it's very stressful for them (Pre-interview, August 2014).

When discussing the idea of using DD to support home-school communication, PG admitted to feeling apprehensive due to her lack of knowledge of ICT. "I'm a bit scared, to be honest. [Laughs]. My generation, we're not as technically minded. So I worry I won't be able to work it" (Pre-interview, September 2014). However, she did express how she found Apple mobile devices, such as the iPad and the iPhone easier to navigate due to their intuitiveness: "initially I was nervous but they are very handy and now I can pretty much navigate it" (Pre-interview, September 2014). In spite of her reservations, PG believed technology to be the way forward in supporting home-school communication. The benefits discussed included the quick way messages could be shared and the ease with which they could be accessed.

TG was very positive about the idea of using DD for home-school communication, as she shared:

I think it would be great. I think it would be really good for the child to be involved with it because it's such a great opportunity for them to reflect on their day and highlight the positives of what happened, also some of the girls with special needs, it might suit their mind, might be harder for them to recall what happened, whereas if it's explicitly there for them, then it jogs their memory and they can think of the positives about those particular events rather than just thinking back to the day as a whole (Pre interview, August 2014).

Both participants attended the information session. From the start, TG was extremely enthusiastic about the DDI and participated fully in the innovation. PG was more apprehensive, in part due to her knowledge and application of technology. During the DDI, although TG shared information frequently, little was returned by the parent.

Case study H

PH was in the 40-49 age group and was married or in a de facto relationship. She had three children under the age of 16 at home and was a full-time home maker. PH had a smart phone and owned one computer and three tablets. She used the Internet for less than an hour each day; for emailing and accessing information about news and education. PH was happy with the level of communication between home and school and her preferred mode of communication was email.

TH was in the 20-29 age group and had her own smart phone. She used the Internet for between one and three hours each day for a range of tasks; including emailing, online shopping, entertainment, social networking, word processing and

reading news and education. TH was happy with the level of communication between home and school but indicated she would be happy to receive more face-to-face communication from her parents. This was also identified as her preferred way of communication.

PH felt the purpose of home-school communication was to ensure parents were kept informed on their child's academic progress and were made aware of how they could further support their child at home. She felt home-school communication was more important for children with AN as "…more things can happen in a day that may affect a child with additional needs" (Pre-interview, September 2014).

PH preferred email as a communication method over the paper diary as this gave her more privacy to discuss her child's learning problems and any other sensitive issues, as she shared:

> *I don't really use the paper diary because what I normally communicate to TH was stuff I didn't want CH to read. And so I would e-mail her directly. So if it was a thing of, you know, CH's lost her hat, I would put that in the diary. But if it was the meatier stuff of her learning difficulties, any anxieties at home, any issues going home from school, I wouldn't write that in Evernote or a paper diary* (Pre-interview, September 2014).

In particular, PH discussed learning issues with the teacher via email because she did not want CH seeing the information.

Similarly, TH felt the purpose of home-school communication was to inform parents on what the child was working on at school so parents could reinforce concepts at home. TH felt home-school communication was essential for children with AN as she believed working collaboratively had more impact on the outcomes of the child.

Most communication sent home by TH was reminders. A small element of communication was used to share positive outcomes or something the teacher felt needed to be practiced further at home. Although TH preferred face-to-face communication, she understood the need for alternative methods for those parents who were working and could not visit the school. TH enjoyed using PDs with her children as she felt it gave them a sense of responsibility, whereas email was only exchanged with the parents; however, TH felt PDs were too big for the smaller children to carry around with them and difficult to navigate. Additionally, TH commented on the fact that PDs were not used consistently by all her parents for communication.

TH felt a challenge of home-school communication was that written messages could be interpreted in different ways and that sometimes, face-to-face was essential for dealing with more sensitive or upsetting issues. With this particular family, TH felt home-school communication had not been very successful so far, as she felt the communication was often lost and the PD was not used.

PH admitted to her lack of ability in the use of technology when questioned about using the DD for communication. However, she did express that if that was the way the school was going to communicate, then she would learn how to use it. PH felt the digital diary could be beneficial as sometimes the diary was left at school, or notes were not fully recorded:

Well, sometimes CH forgets her diary. Sometimes she doesn't write into her diary the things that she needs to write. Sometimes I forget to look in the diary. [Laughs]. So if there was an electronic one, and that was like the one-stop shop, then there's probably less chance of me missing things (Pre-interview, September 2014).

TH felt the use of technology for communication purposes was a good idea and "the way forward" (Pre-interview, August 2014). She was already using email as a method of communication, in addition to the paper diary. TH felt email was a quicker process as the note appeared on the computer using just one click. However, with a paper diary, "you have to flick through, so it's quite time consuming and not all the girls use it" (Pre-interview, August 2014). TH also discussed how using a digital diary would mean the children not needing to carry a heavy paper diary in their bags.

Three weeks into the innovation, the teacher who started the trial (TH) went on leave, and another teacher (TI) replaced her for the remaining five weeks of the innovation. TI was in the 30-39 age group. She owned a smart phone and had one computer and tablet at home. She did not have access to the Internet at home and used the Internet for less than an hour a day; primarily for emailing, social networking, word processing and reading news and education. TI was happy with the level of communication and her preferred mode of communication was email.

Although the researcher met with the replacement teacher and provided the same information that had been provided to the rest of the participants prior to starting the DDI, the researcher felt this change impacted on this case study. Whereas the original teacher had been enthusiastic about the innovation and had used a range of multimodal features to share the child's learning in the DD, the replacement teacher understandably found it difficult to continue the innovation, along with settling into the school, and made limited entries within the five-week period. As PH explained: *"But then after the holidays and PH went, I think there was just, you know, a time of adjustment for the new teacher, so much to have to deal with. I ... they just didn't seem, you know, there wasn't as much to read"* (Pre-interview, September 2014). Furthermore, towards the end of the innovation, PH experienced problems with accessing Evernote on her device, which stopped her using the digital diary. Unfortunately, the researcher was not able to interview TH to find out her views on the use of a DD during the initial phase of the DDI.

Case study J

PJ was in the 50 or over age group and was married or in a de facto relationship. She had one child under the age of 16 at home and worked for 25 hours each week. PJ did not have a smart phone but had four computers and one tablet at home, which connected to the Internet. She used the Internet for more than three hours each day; for emailing, word processing, accessing news and education, as well as using it for work purposes. PJ was happy with the level of communication between home and school and preferred email as the communication mode.

TJ was in the 30-39 age group and owned a smart phone. She had one computer at home and used the Internet for less than an hour each day. She used the Internet for emailing, entertainment, social networking, word processing and news and education. TJ felt overwhelmed with the communication received from parents each week and wanted to receive less. Her preferred mode of communication was email.

PJ felt the purpose of home-school communication was to provide parents with feedback about how the child was going. She also discussed the importance of teachers and parents working together to support better outcomes for the child.

PJ believed home-school communication was particularly important for children with AN, as these children often had extra needs that the parent had a comprehensive understanding of. She expressed how essential it was that these requirements were passed on to each teacher to facilitate the child's success in each learning environment. As PJ stated: "*All that communication needs to be two ways. And you need to be able to educate the teachers*" (Pre-interview, September 2014). PJ had created a document providing an overview of the child's condition, with letters from a variety of external specialists. This document was given to teachers at the start of each school year so that the parent could be sure that the child's needs were fully

understood. PJ continued with this issue and explaining how, unless the communication process is really effective, parents have to continue providing information about the child's additional need to each teacher to ensure the child's needs are being met:

> *parents with kids with special needs find this a lot, getting the school to go in that direction even just a little bit sometimes let alone a lot is hard yards and its repetitive yards. You keep … like Groundhog Day, you keep going back there* (Pre-interview, September 2014)*.*

When asked about the purpose of home-school communication, TJ felt it was to build a rapport with the parents and facilitate discussions about learning; including positive outcomes and concepts that needed extra support at home, as well as successful strategies being used.

TJ felt home-school communication was particularly important for children with AN as she believed parents of children with AN often have additional worries about the child. She explained: *"They want to know that they're fitting in, that they're accessing the curriculum and that they're getting on with other students and enjoying school"* (Pre-interview, August 2014)*.* TJ frequently shared strategies used at school with parents of children with AN. After their implementation, she would meet to reflect upon and refine the strategies used to ensure the child continued to make progress.

TJ also discussed how communication could help children with AN fit in with their peers. As she shared:

> *Eating habits have been an issue, so it's encouraging the whole class to have a crunch and sip on their desk if they need it so it's not singling her out and that everybody's doing it, and having coloured water bottles because she had to*

drink Powerade and not just water. So making it that everyone can have a coloured water bottle. Making it so it's not obvious that they need those things (Pre-interview, August 2014).

Both participants attended the information sessions. TJ showed to be a willing participant in the DDI and used the DD consistently during the innovation. However, PJ admitted to having no interest in using a different method for communication but hoped it might have some benefits for the child. Although she admitted to seeing benefits of using Evernote from the information session, she did not have the time or inclination to learn and apply something new when current methods of communication were already being used successfully.

Case study K

PK was in the 30-39 age group and was married or in a de facto relationship. She had two children under 16 living at home and worked for 30 hours each week. PK owned a smart phone and had four computers and four tablets at home. She used the Internet for less than an hour a day; for emailing, online shopping, entertainment, social networking, word processing and reading news and education. PK was happy with the current level of communication and her preferred mode of communication was email and face-to-face.

TK was in the 20-29 age group. She had a smart phone and had a computer and tablet at home. She used the Internet between one and three hours each day; for emailing, online shopping, entertainment, social networking, word processing and news and education. TK indicated that she was happy with the level of communication and her preferred mode of communication was email.

PK felt home-school communication was particularly important to ensure she knew what was happening at school. As she explained:

I don't know how reliable CK is in terms of coming home and telling me verbally everything that she needs to. So I think it's really, for me, it's a crucial backup to have the communication because CK may or may not remember everything to recall to me. And we might let something go by and she'll miss it and I'll miss it and then I'll feel bad for her, but I'll also feel bad because I haven't done anything (Pre-interview, September 2014)*.*

She highlighted how important home-school communication was for children with AN, as she used the information from school to break tasks into more manageable pieces for her child. As she stated:

CK kind of needs time, so the more time she has to break, say, an essay writing assignment down the better it is for her. She can … if you give her an assignment and said: 'This is your assignment and it's due by this date', to her it's just like, 'I can't do that, that can't compute in my brain.' So she will just not do it. She needs it broken down into, 'Okay, CK, you've got this assignment due, let's break it into … let's do the introduction, what do we need to do for the introduction. Then you need … this is body, what do we want to do that about?' And then really breaking it down into bit by bit for her (Pre-interview, September 2014).

Although PK showed she was happy with the level of communication in the questionnaire, during the interview she discussed how she sometimes felt frustrated when she had not received all the necessary information from school:

I have felt frustrated in terms of … sometimes in terms of … I think before we were very communicative in e-mail there were times when I feel like I'm not informed because CK hasn't … I don't know that CK's brought me all the information that I need and then suddenly she'll say: 'We've got an assignment

due on Friday, Mummy'. And I think … and she hasn't started it or that sort of scenario. So that would really frustrate me (Pre-interview, September 2014).

TK felt home-school communication was essential for informing everybody if the child was doing well or if there were any issues. As she shared: *"Just make sure if there's something going on with the child, the parents can let us know straightaway and vice versa"* (Pre-interview, August 2014)*. She felt home-school communication was particularly important for children with AN as they have a behaviour management plan that all parties need to be aware of.

TK mainly used email for communication purposes, as with the PD, she felt she did not have the time to check them each day and they would frequently go missing.

PK was positive about the idea of using a DD to support home-school communication and felt it could be beneficial for her child:

And CK would do much better, her OT was saying the same thing, doing much better with an electronic task list/reminders and those sorts of things. Because that's relevant to her and her generation, they're operating on iPads every day. So I think that moving her to an electronic version would be great for her (Pre-interview, September 2014).

Both participants attended the information session. However, the DD was not used at all by the teacher and infrequently by the parent. Reasons for this were that both the family and the teacher became sick during the innovation, and both were experiencing busy lives with work demands and other home-based demands.

Case study Y

This case study included a teacher who was in another case study (TD) and a second parent (PY). PY was in the 40-49 age group and was married or in a de facto relationship. She had three children aged under 16 at home and worked 10 hours a week. PY owned a smart phone and had two tablets at home. PY used the Internet for 1-3 hours per day and her computer use was generally for emailing, online shopping, social networking, word processing or for accessing news and education. PY was not happy with the level of communication and wanted to receive more information from the school. Her preferred mode of communication was email.

As shared, TD was in the 40-49 age group. She owned a smart phone and had one computer at home. She spent more than three hours a day on the Internet and used it mainly for emailing, social networking, word processing, news and education along with school based work. She was mainly happy with the level of communication between home and school; however, she felt she would like more communication from some of her parents and less communication from others.   Her preferred method of contacting home was via email but she did not indicate a preference for how she received communication from home.

PY felt home-school communication was important for children with AN as could provide parents with extra details about the child's school day that she did not receive from the child themselves. As she explained:

> *But day to day there's not as much at the moment and that would be quite good. Even just little things. If I catch TD she'll say, you know, CY got whatever in her spelling test or she did this today. But often you can't always talk to the teacher in person every day, it's just not practical* (Pre-interview, September 2014).

Additionally, PY believed home-school communication was important for enabling parents to feedback home events, which could impact on their school learning.

As discussed, TY felt home-school communication was essential for reassuring parents, as well as enabling them to learn about the child's outside of school interests so these could be linked with learning at school.

PY did not feel the PD was an efficient method of communication as it did not reliably travel between home and school each day. However, the DD was just an extension of what was already being used at school and at home. As she shared:

Well, I think that the way forward is that everything is nearly done, it's not just going to be diaries, it's … I just look at CY on her iPad at the moment and she does all of her … all of her books are on the iPad. But she has a manual diary. It's just … [laughs] all these different scenarios going on (Pre-interview, September 2014).

TD did not comment about the use of DD for home-school communication prior to the DDI.

Both participants attended the information session. Although both the parent and teacher felt there were many advantages to using DD for communication and felt the use of digital means was the way forward, the DD was used intermittently by both participants for the duration of the DDI.

Case study Z

This case study also included a teacher who was already involved in another case study (TC), with a second parent (PZ). PZ was in the 50 or over age group and was married or in a de facto relationship. She had one child under 16 living at home

and was a homemaker. PZ had a smart phone and also had one computer and two tablets at home. She used the Internet for between one and three hours each day, and used technology for emailing, word processing and reading news and education. PZ indicated she was not happy with the level of communication and wanted to know more about the areas she needed to focus on at home with her child. Her preferred mode of communication was email.

As shared, TC was in the 30-39 age group. She had a smart phone and owned one computer, as well as having a work computer on loan. TC accessed the Internet for less than an hour per day and her use was mainly for emailing, online shopping, social networking, word processing and news and education. PC indicated that she was happy with the level of communication between home and school and preferred to use email to contact and receive communication from home.

PZ felt home-school communication was important for letting parents know what they needed to do at home to support their child. As she explained: *"To let the parents know what the student needs to do, when it needs to be done by and what additional work needs to be done to keep the student up-to-date with the rest of the class"* (Pre-interview, September 2014)*.* She felt this was particularly important for children with AN as they did not often know or understood classwork expectations or how to meet them.

These thoughts were similar to TZ, who believed in ensuring parents knew the learning outcomes of the child so they could provide ongoing support at home.

PZ's main dissatisfaction with home-school communication was that she did not often receive feedback on work she had supported her child with at home. As she shared: *"So there's no communication about what needs improving or how it could be improved or what didn't work in the piece of work last time"* (Pre-interview, September 2014). Additionally, she felt the PD was used primarily for recording

weekly administration, rather than learning expectations and outcomes. This reflected TZ's worries that she was sending home adequate information for her parents to develop a clear picture of their child's achievements and challenges.

PZ had mixed views about the use of a DD for communication. She believed it could work successfully but questioned who would be recording in it and whether it would be too time consuming for the teacher.

Both participants attended the information session and were enthusiastic about the DDI. However, during the DDI, TZ's use decreased and in the post innovation interviews, she admitted she struggled to balance its use with all the other home-school communication methods being used with the rest of the children. PZ's use stayed consistent throughout the innovation.

What do Parents and Teachers Seek from Home-School Communication?

When parents and teachers were questioned about what they wanted from home-school communication, their responses came under three different themes:

- Being informed;
- Collaboration and
- Parental engagement.

Additionally, the participants spoke about the features they would want from a communication tool to enable effective communication between home and school.

Being informed

Child's development: All 10 parents (n=10) and eight teachers (n=8) felt home-school communication was essential for keeping everyone informed on the child's development, at home and at school. As PG shared:

so that the school knows what's going on with CG at home and vice versa. So for instance, when I say I talk to the teacher daily I'll say, you know, we had a bad morning this morning, just to sort of give her a heads-up that, you know, she should be tricky today (Pre-interview, September 2014).

Alleviate concerns: TG shared how keeping parents informed helped to alleviate some of their worries, which she felt were particularly highlighted when parents had children with AN:

The parents of children with additional needs have so much stress, additional stress to a normal parent who's raising a child without those issues. To alleviate some of that stress and worry about their child, then you know you're doing the right thing if they're a little bit more confident in letting their child be with you for the whole day, trusting you and knowing they'll get that information back. That's what they need to function because it's very stressful for them (Pre-interview, August 2014).

Academic progress: Five parents (n=10) discussed the need to be informed about the child's academic progress and one parent (n=10) and one teacher (n=8) discussed the need to keep updated on the child's social wellbeing, as this often influenced a child's performance in school. As TA shared:

To inform both sides, the parental side and the school side of any issues from the school's perspective going towards the parents. From the parents' view, there's social elements, there's issues at home the school needs to be aware of that might affect educational outcomes, so it's about getting on the same page (Pre-interview, August 2014).

Emotional welfare: Six teachers (n=8) and four parents (n=10) believed the emotional welfare of a child with AN was an essential topic for home-school communication. TK explained: "*If they're sick or if they're particularly tired or something's not right with their mood, I would just email the parents and ask them if everything's ok*" (Pre-interview, August 2014). TC also discussed sharing this information:

> *Because they've got extra things that we have to cater for and deal with and we need to know if there's things that are changing with them at home or what they're working on at home, or if there's things that are worrying them, stressing them out, that sort of thing* (Pre-interview, August 2014).

PK appreciated hearing about their child's emotional state as part of the feedback from their child's teacher, as she shared: "*She'll let me know all sorts of things that have been happening, even if it's just a social thing that's happened or child's mood*" (Pre-interview, September 2014). PY also shared: "*if there was an incident between a couple of friends, that sort of thing I think is important*" (Pre-interview, September 2014.

Four parents (n=10) also discussed communicating with the teacher about their child's emotions. PY liked to inform the teacher in person of her child's emotional state if the morning hadn't gone well: "*I would feedback perhaps if the morning hadn't gone very well and things weren't quite…sometimes you can tell if it's not going to be a great day*" (Pre-interview, September 2014). PG operated in a similar way with her child's teacher: "*when I say I talk to the teacher daily I'll say, you know, we had a bad morning this morning just sort of give her a heads-up that, you know, she should be tricky today*" (Pre-interview, September 2014). Two parents (n=10) also communicated about medication their child was taking. As PJ explained: "*It was good to just say 'TJ, look by the way, CJ's doing this topical treatment on her head at the moment and probably just needs to be something you're aware of'*" (Pre-interview, September 2014).

The whole child: A common theme to emerge from interviews with parents and teachers was the importance of sharing information from parents to the school. Many of the participants agreed this was particularly true for children with AN because of their extra requirements; the knowledge parents have about their child's needs and appropriate support and strategies that have already been successfully implemented at home to help the child succeed. As PJ articulated:

> *it is critically important for these kids to have good communication so that …*
> *because to be blunt about it, the person who's with these kids 24/7, who takes*
> *them to the specialist, and most of these kids do have specialists in their lives,*
> *it'd be pretty silly and a pretty low grade special need if there wasn't (sic)*
> *specialists involved, and CJ's got a suite of them. All that communication needs*
> *to be two ways. And you need to be able to educate the* teachers (Pre-
> interview, September 2014).

In addition to sharing information about her child's needs, PY felt it was beneficial to share the child's home experiences with the teacher to give the teacher a better understanding of the child. This idea was discussed further by TD, who liked to try and link children's outside experiences with classroom learning, as she explained: **"***So it's good for me to understand also their interests and try and feed their interests into planning***"** (Pre-interview, August 2014).

Open and honest: Four teachers (n = 8) and three parents (n=10) discussed the importance of communication being open and honest.   TD talked about the importance of having an open-door policy: "*I like to think that it's an open-door policy that parents can come and say, 'Can I have a word?' or 'Can I have some of your time before school or after school?'*" (Pre-interview, August 2014). This view was shared by TG: "*the purpose is just to let them have an opening into the classroom … so the door's always open and they can see what's happening in the classroom, what our goals are,*

what we're going to achieve" (Pre-interview, August 2014). Honest communication was also discussed in relation to keeping parents updated about a child's attainment to ensure parents had realistic expectations when formal reports were sent home. As TB shared*: "there's no surprises in terms of reporting, which is great because they've been on the same track as us, we've had constant meetings, they know that they're not making benchmarks, they know they're on their own IEPs"* (Pre-interview, August 2014).

Timely communication: Two parents (n=10) and one teacher (n=8) expressed the need for communication to be timely to work effectively. One teacher (n=8) gave an example of timely communication in ensuring children kept up to date with schoolwork:

> *If we're giving out additional work or work that needs to be finished at home, parents are aware of that and can actually assist with the children at home to get that completed in a timely fashion, and to get it back to us, otherwise it will then impact on the learning, and of course their academic performance and ratings as well* (TA, Pre-interview, August 2014).

Additionally, timely communication was felt to be particularly important if parents were waiting for feedback on a piece of work their child had recently completed. As PZ explained:

> *Or a piece of assignment, you never get to hear how they did, whether they got an A, B or a C or a D. Or also whether they get to … what areas need improving. So, this was good, you got a C but next time you should improve the sentence structure or the introduction, or you need a better type of conclusion, something like that. So, there's no communication about what needs improving or how it could be improved or what didn't work in the piece of work last time* (Pre-interview, September 2014).

PC also commented on this situation: "*But sometimes it's frustrating because you want some feedback straightaway and it takes a week and a half to get … it's like it goes into a black hole*" (Pre-interview, September 2014).

Transition time: Three parents felt a level of frustration when their child moved from one teacher to another at the end of a school year. For these parents, there was a strong belief key information hadn't been passed on from the former teacher to the next: "*I suppose at the start it was not having everyone on the same page, that was probably the challenge at the start*" (PPD, Pre-interview, September 2014). As such, they felt the teacher had to start again in getting to know their child, including their strengths and required support. As PA stated: "*some of the things that were in place last year haven't been translated well this year. And maybe if there was more of a track record of, you know, written whatever, that might have made things easier*" (Pre-interview, September 2014). Although each part of the school was based at the same campus, they operated separately from each other and this added to the challenge:

> *With the transition to middle school for CC, is knowing that she was finding maths challenging and having to wait for her to go through their progress. It was sort of week seven of term one before … they did an initial testing to see where all the girls were at and she was sort of borderline. And then they had two weeks of the first module and then she got 30% for that. Then it rang alarm bells. But seven weeks had gone past* (PC, Pre-interview, September 2014).

PJ added to these concerns: "*the most difficult thing is taking them from one year to the next. Even in the same school you would start again and you would have to re-educate the teacher and so on*" (Pre-interview, September 2014). PA suggested if more had been recorded, this might have been used and passed on more effectively:

It's a consistency and feeling also … some of the things that were in place last year haven't been translated well this year. And maybe if there was more of a track record of, you know, written whatever, that might have made things easier. Don't have to go and redo things again (Pre-interview, September 2014).

Collaboration

Parents and teachers working together: Four teachers (n=8) and two parents (n=10) believed effective home-school communication was essential for building a good rapport between the teacher and parent and enabling them to work together. As PA shared: *"it's got to be a partnership between the school and the parents to support the kids, and it doesn't happen each working independently. You can't get the most effective support that way if nobody's aware of what each other's doing* (Pre-interview, September 2014). TJ explained further benefits of effective collaboration from a teacher's perspective:

So, I enjoy developing the relationship. So, it's not just during interview time or report time that you see them. The more frequently that you see them the more relaxed everybody is, the more you get to know them and the more they just share little things. So, you actually get to know about the family life and what it's like and kind of understand why they might behave a certain way or why they might be tired one day, it's because I know they were on a fishing trip all week or something like that, you know (Pre-interview, August 2014).

Equal partnership: When discussing communication between parents and teachers, three parents (n=10) and three teachers (n=8) emphasised the importance of having an equal partnership, with communication going from home to school, as well as school to home. As TC commented: **"*it's two-way in terms of them telling us things**

we need to know and we're telling them things that they need to know" (Pre-interview, August 2014). PA explained this idea from a parent perspective:

> *So, I understand that you can be told what's going on with the school but also be able to interact a little bit more. So, ask questions, give some feedback. You know, ask for updates on how things are going. Particularly things that might be challenging CA in class, or she might need some help with* (Pre-interview, September 2014).

TJ explained the consequences of one-way communication:

> *It might only be effective for a while because you don't know if they're taking it on board and using it or listening. So, I think it needs to be two-way, yes. And it continues if it is two-way, the communication keeps going and going* (Pre-interview, August 2014).

Community: Five parents (n=10) and three teachers (n=8) went beyond parent and teacher collaboration and acknowledged, particularly for children with AN, how essential it was for the community to be part of the communication process, in working towards a shared goal for a child. As TC explained:

> *as well as home/school communication, we also have lots of specialist … lots of doctors and other people who are involved in these children who we work with and communicate with as well, like speech therapists and all that sort of stuff. So, as well as the home/school communication we've also got communication with all the other professionals that go along with these girls as well. So, I suppose that's added in because that's all part of the child too, and their needs in the classroom* (Pre-interview, August 2014).

PB expressed similar thoughts during her interview, commenting:

these kids do need a bit more help from everybody, I guess, all the hands work together. The school just can't do it and I can't just do it or the Chiro can't do it or the OT just can't do it (Pre-interview, September 2014).

PG also agreed with these ideas and reiterated the importance of the parents, teachers and community working collaboratively to ensure the success of the child:

So, I just think, yeah, you need to make sure everyone that's assisting CG is on the same page, and the only way you can do that is with regular communication. Otherwise it's too confusing for CG if the tutor is working on one sound and the school's doing another sound and I'm, I don't know, doing something else. We all need to know what the theme for that week is so we can all tackle it, I guess, at the same time (Pre-interview, September 2014).

Child involvement: During the interviews, only two teachers (n=8) briefly discussed the inclusion of the child in the communication process. This theme will be returned to in the next section.

Parental engagement

Nine parents (n=10) and four teachers (n=8) felt if parents were fully informed about their child's progress in school, they would be better equipped to follow up on classroom learning at home. As PK shared:

I think it's just feeling informed, and I don't think as a parent you feel like you can step in and necessarily help her school situation without knowing exactly what's going on and what she's getting at school and what she's not and what she's missing. So, I think that it's empowering in the sense that more information is better, you can act on it (Pre-interview, September 2014).

Home discussions: For nine of the parents (n=10) and two of the teachers (n=8), following up on learning included parents having discussions at home with their child about the day's learning. TG shared how she tried to initiate this:

> *Once a week I send home an email letting the parents know what we're learning that week. So, I go through all the learning areas and I explain just briefly what each lesson will be about. In the hope that the mums and dads will say to them: 'how was learning about heat sources in science?' And you know, 'when I was at school, we did this, this and this'. So, I hope to start those conversations by doing that (Pre-interview, August 2014).*

Revisiting learning: Effective home-school communication was shown to be essential for supporting parental engagement in their child's learning at home as often, children with AN do not understand what they need help with, and have difficulties expressing these thoughts verbally to their parents. As PZ explained:

> *I think it just gives the parents the opportunity to reinforce what needs to be done. Whereas they won't necessarily know what needs to be done and they won't necessarily communicate what needs to be done. And if they've got additional needs, they might not understand in the classroom situation what needs to be done at home* (Pre-interview, September 2014).

PC shared similar thoughts to PZ as she commented:

> *And have a bit of backup with having the heads up of what she's working on so that we can back it up at home because she's not that great and knowing what she needs to do at home. You ask her for … 'what homework have you got? 'Oh nothing', and then find out that there's a project that needs to be done* (Pre-interview, September 2014).

Four teachers (n=8) shared similar views on the importance of parents being informed so they could support their child at home. As TA explained:

> *So, important for us that if we're giving out additional work or work that needs to be finished at home, parents are aware of that, and can actually assist with the children at home, to get that completed in a timely fashion and to get it back to us, otherwise it will then impact on the learning and of course their academic performance and ratings as well* (TA, Pre-interview, August 2014).

In addition to following up on work at home, one parent (n=10) and two teachers (n=8) discussed the impact of sharing strategies that had proven successful with the child, so they could be repeated by the corresponding parent or teacher. PC provided an example of where her child had been experiencing difficulties in learning music and after learning the strategies used at school, she repeated them at home, which she felt helped her child learn more effectively:

> *So, having the written instructions, I can read music so I can do rhythms and stuff and we just reinforce some of that. And then I can see that she's learnt a particular way of doing something so I'll just mirror what she's doing* (Pre-interview, September 2014).

TB agreed that if similar strategies were used at home and at school, then this would have more impact on the child's learning outcomes, as she shared:

> *Just to have that consistency at school and home. I think the parent obviously has a massive influence over their child's education as well. And if we can work in partnership and they're doing what we're doing, talking the same language* (Pre-interview, August 2014).

Time management: A final way that parents and teachers felt home-school communication enabled parents to engage more effectively in their child's learning was that they could support their child with their time management skills. PA explained:

> *Just so, you know, people particularly with the kids that aren't particularly well organised, that we can understand what needs to be done for school to make sure that we're … not only what needs to be done if it's homework or preparation for classes but also getting ready for what's on the next day at school* (Pre-interview, September 2014).

PK shared a similar view and expressed her disappointment if she felt she had not done enough to prepare her child for the daily school requirements:

> *I don't know how reliable CK is in terms of coming home and telling me verbally everything that she needs to. So, I think it's really, for me, it's a crucial backup to have the communication because CK may or may not remember everything to recall to me. And we might let something go by and she'll miss it and I'll miss it and then I'll feel bad for her, but I'll also feel bad because I haven't done anything* (Pre-interview, September 2014).

The communication tool

Four parents (n=10) discussed aspects of the communication tool that they felt were important to support effective home-school communication. Two parents (n=10) felt it important that they could respond to the teacher's comments when convenient. The same two parents also wanted the ability to write as much as they wanted to, when responding. PY liked to be able to access the conversation history so she could refer back to sections, if needed. Finally, PG expressed the need to have communication written down so it could be reflected upon later, as she shared

Well, I like to verbally talk but I find that if it's written down, it's better because I can reflect on it. You know, quite often when I'm speaking to the teacher, I'm distracted with one of my children or another child comes up and things like that. So, if it's written down, like an email, at least I can refer to it and show my husband (Pre-interview, September 2014).

Comparison of the Digital Diary and the Paper Diary

Following the digital diary innovation (DDI), parents and teachers were questioned about their thoughts on the DD in facilitating effective communication between home and school, compared with the PD. The responses provided were sorted under the key themes the parents and teachers had agreed were the characteristics of effective communication. These were:

- Being informed;
- Collaboration;
- Child involvement and
- Parental engagement.

Analyses of the data showed one idea, which had previously been grouped under collaboration, had developed into a key standalone theme. This was the theme of child involvement. The end of this section includes additional thoughts parents and teachers shared about the digital diary as a communication tool. This section was created, as the extra thoughts shared, although important to discuss, did not fit under any of the key themes discussed.

Two key features of the DD

Analysis of the data showed the DD had two key features that facilitated improved communication between home and school, compared with the PD. These were the *accessibility* and *multimodal* features and these features proved to enable

improvement for all four themes shared above. This section will start by outlining these two key features of the DD. A discussion will then follow on how the two key features of the DD facilitated improved home-school communication for the four themes that emerged from the data: *being informed*, *collaboration*, *child involvement* and *parental engagement*.

A key feature of the DD was the *accessibility* features. For the purpose of this study, *accessibility* refers to how accessible the tool was for communication purposes. This includes the ease in which the diary could be accessed, the ease in which the diary could be used, as well as the ease in which changes could be made and information could be shared. The second key feature of the DD was the *multimodal* features. For the purpose of this study, *multimodal* refers to the different ways in which the information could be recorded and shared in the DD. This included the sharing of photographs, video, audio recordings, links to websites and the ability to create checklists that could then be checked.

The *accessibility* and *multimodal* features of the DD trialled showed the potential to improve home-school communication and transform the home-school communication process for reasons that will be discussed in this section. In this section, each theme will be discussed; which will include an examination of the key points made by participants in the questionnaires, pre-and post-interviews and an analysis of the paper and digital diaries.

Being informed

Change of focus: During the pre-innovation interviews, three parents expressed a desire to receive more information about their child's progress. Analysis of the PDs showed that the most common mode of PD entries were handwritten comments relating to daily administration. These entries were written in the form of one or two words and consisted of reminders for parents of upcoming important dates and any timetable changes (see Figure 4.1).
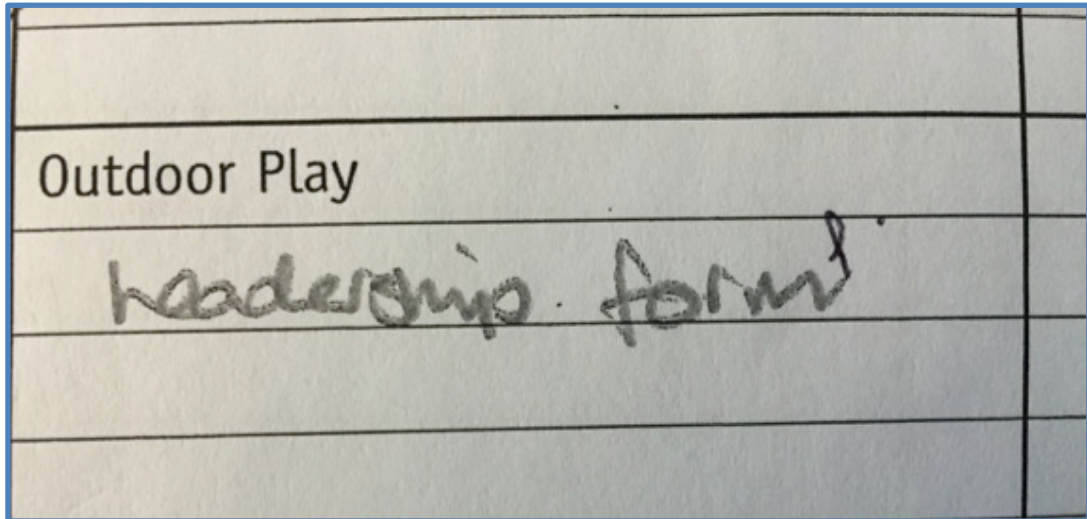
Figure 4.1: Example of a reminder written by a teacher in the PD

(Extract from the PD, June 2014)

However, during the post innovation interviews, two parents (n=10) and three teachers (n=8) discussed how the information in the DD changed focus. It was felt the information had changed from being administrational based to being more focused on the child's learning, and learning was discussed in nine of the DDs (n=10), compared with six of the PDs (n=9). As PB explained:

> *Because the paper diary, you normally would just use for 'CB forgot something',*
> *or 'CB this or that', but with the … at the beginning we were getting little*
> *pictures and 'CB did this today', kind of that, more that kind of thing which*
> *wouldn't happen in the [paper] diary (Post interview, November 2014).*

Comprehensive: In the PD, the small areas provided for written comments showed to be restrictive and notes would often be written across several days or squashed into the small space provided (see Figure 4.2). As PK explained:

> *There's really not room in the physical diary to go into much detail at all unless*
> *you write a letter and sort of clip in there, and I think the thing then with that is*

it gets lost, it gets, you know, it doesn't get to the teacher (Post interview, November 2014).
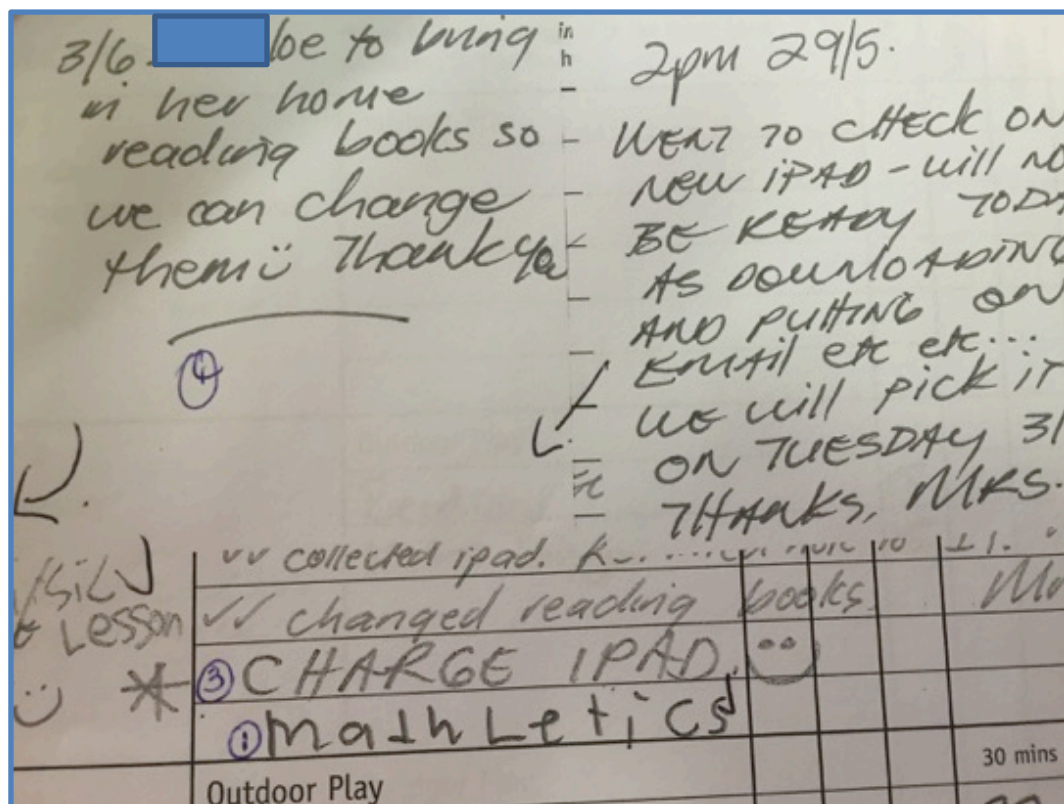

Figure 4.2: Example of an oversubscribed PD (Extract from PD, June 2014)

However, the DD offered unlimited space to write comments, as the text box expanded as needed. This encouraged participants to write more detailed sentences in the DD than had been recorded in the PD (see Figure 4.3).
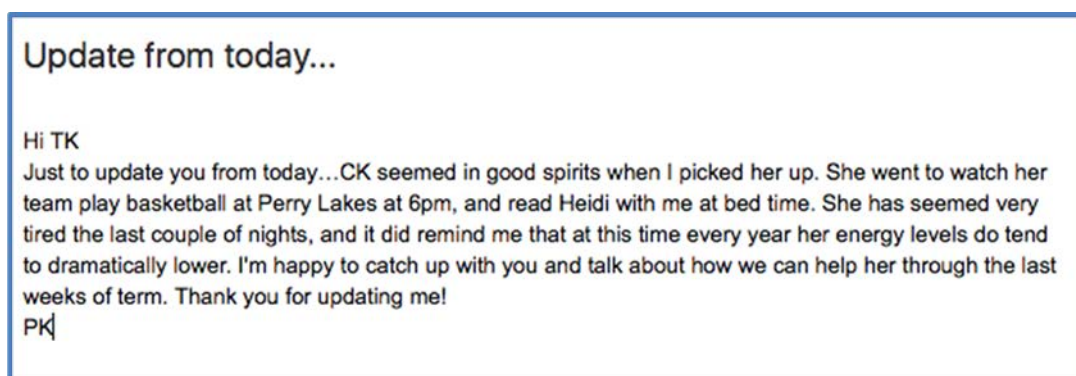

Figure 4.3: Example of an extended text box in a DD entry

(Extract from DD, November 2014)

Learning comments in the PD were shared in six (n=9) of the PDs; however, like the administrational comments, the learning comments were written using short phrases and were only found in a small amount of PD entries (see Figure 4.4).
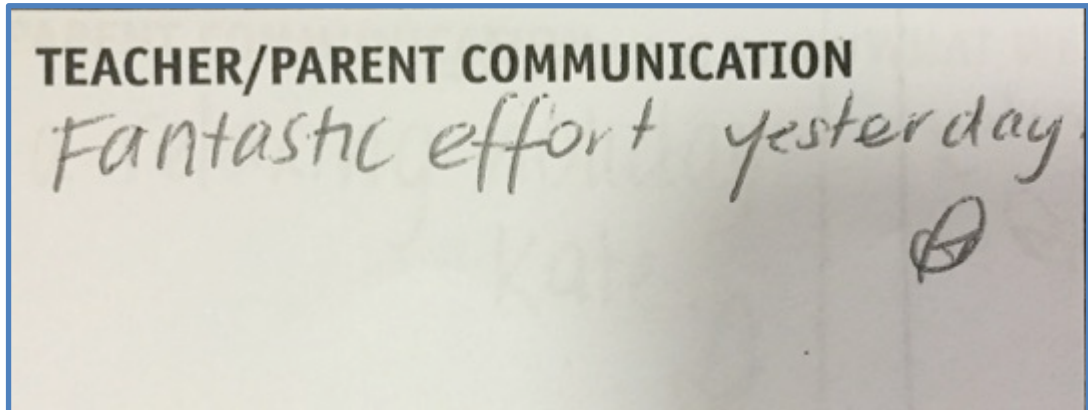

Figure 4.4: Example of a learning related comment written by a teacher in the PD (Extract from PD, June 2014)

However, following the innovation, four parents (n=10) and three teachers (n=8) agreed that the information shared in the DD had become more comprehensive using the expanding text boxes and multimodal features. In her post interview, TB described how she used the multimodal features of the DD to provide more detail for parents (see Figures 4.5 and 4.6):

> *I chose different areas of the curriculum and tried to communicate that learning home. Pretty much instantaneously, when CB had done something awesome, I've got her … to write a narrative, so for instance, just her actually sequencing events with picture cards, so I sent a photograph of that home, ordering Australian coins, that was a mathematics activity, then I just tried to make a little bit of a light hearted one with her sneakers. She had these bright colourful sneakers on and I wanted her to use this as well with her mum and have her … because she's got some expressive language issues and I was*

hoping that she would use her sneakers or something that she, she loved to explain her shoes (Post interview, November 2014).

"CB ordering Australian coins during Maths".

Figure 4.5: Image of child sequencing coins, with accompanying text (Extract from DD, September 2014)
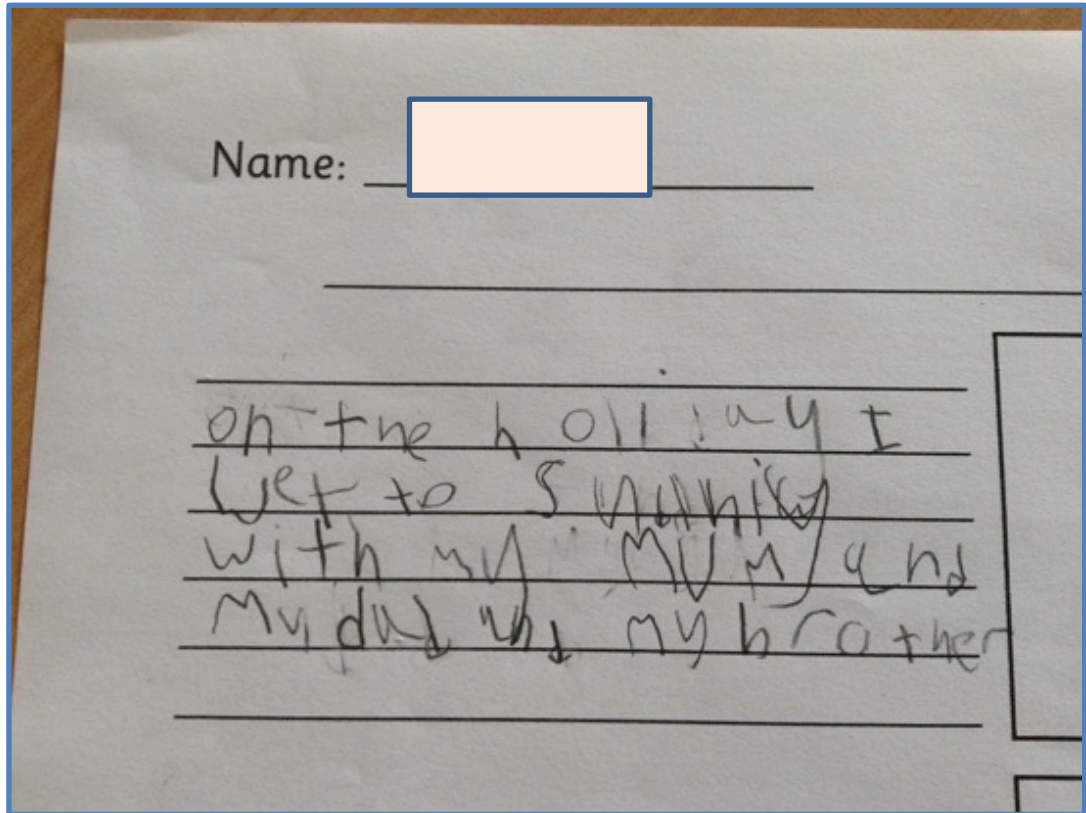
"CB has had a sensational start to Term 4. Check out her holiday recount.

We will be finishing them off today. Go CB!!!!

I hope you had a lovely time in Sydney".

Figure 4.6: Image of recount written by the child, with accompanying text (Extract from DD, October 2014)

TG was another teacher who used the multimodal features of the DD to provide more information for the parents (See figures 4.7 and 4.8):

Well, because it was quite novel to take the photos and everything I send information about what she was doing in class, what she'd particularly enjoyed that day … it just provided a real-life example, so rather just saying CG is learning about angles, I could actually show what she had done (Post interview, November 2014).
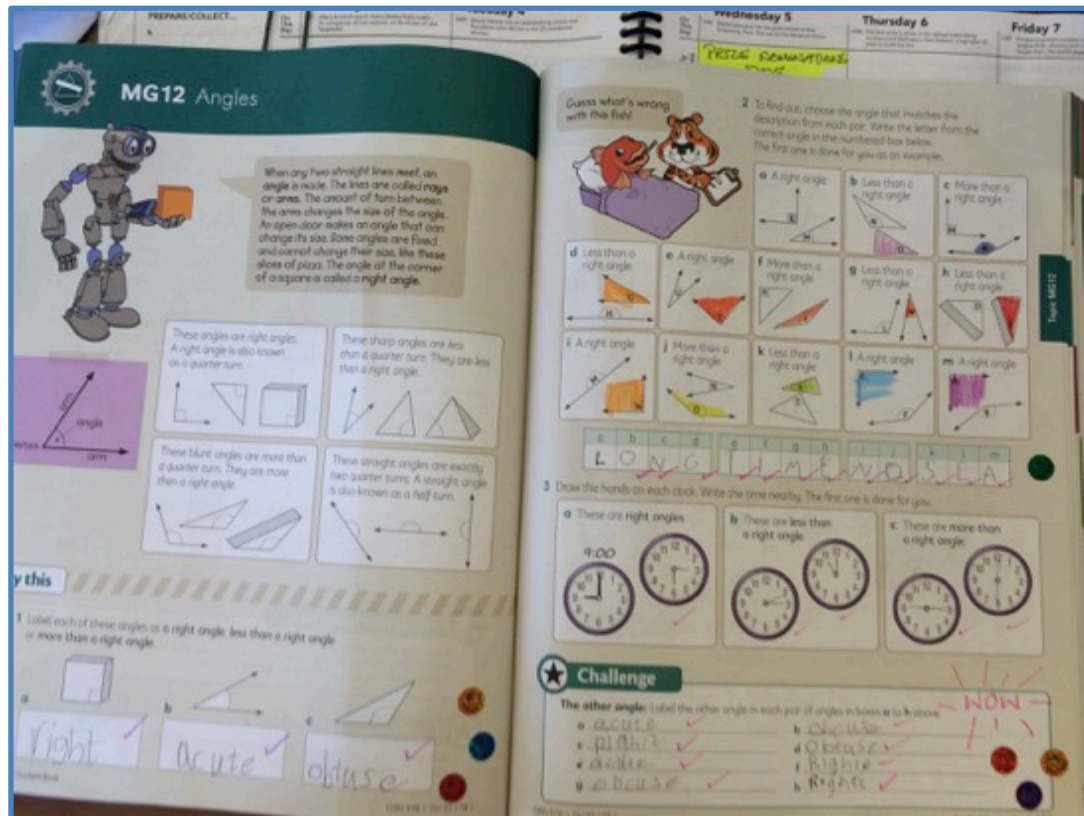
> "CG is learning to identify angles and she is so good at it! She knows the difference between a right angle, acute angles and obtuse angles. Today she did her mathematics tasks all on her own and achieve 100% accuracy. I am so proud of CG.
>
> CG, show mummy how to make these angles. Use two small sticks as the arms or rays: Right Angle, Acute Angle, Obtuse Angle".

Figure 4.7: Image of angle work completed by the child, with accompanying text (Extract from DD, November 2014)

> *"CG had a fabulous day. She was so excited to be participating in the cross-country inter school carnival.*
> *She ran very well and was a super sportswoman!"*

Figure 4.8: Photograph of child celebrating her sports achievements, with accompanying text (Extract from DD, October 2014)

TA also expressed how powerful the multimodal features of the DD were in enabling parents to understand what their child was doing at school: "*Certainly I can imagine from the parents' position they can see some of the stuff that's happening, which is great, which you can't do with a paper diary … so the quality of communication is better, into more depth*" (TA, Post interview, November 2014).

Seeing their child's work regularly was a new experience for most parents, as when PDs were used, the only chance for most parents to see their child's work was at a classroom open day that was held annually. However, during the DDI, when photographs of learning activities were regularly shared in the DDs, parents were provided with the opportunity to have regular insights into the classroom and see the learning undertaken by their child. This aspect was appreciated by PY:

Well, I think the sharing; sharing information that you've done at school with your parents is a good thing. I mean, I think at the moment we go in for, say, a day a year, you know, you go in for a learning journey or whatever it's called, and you look at all their work, and you, you know, look at their art, and look at bits and pieces, and I think on a weekly or daily basis you could probably do more of that in something like Evernote (Post interview, November 2014).

Three further parents (n=8) expressed enthusiasm at receiving such comprehensive information from the teacher. This level of sharing had not been received prior to the DDI, as PY explained:

I think it's really good because it's one thing them saying CY did this or CY did that, but it's really good to actually be able to see the work that they've done, and you wouldn't normally get that. I mean, for instance, I haven't received that by an email before (Post interview, November 2014).

PG also explained how the photographs enabled her to understand better how her child was getting on at school:

instead of just verbally finding out what she was doing, I could see, you know, pictorially what she was doing at school. And that she's not utterly miserable. You know what I mean, she doesn't really like school and she's always said she

had a bad day but I could see through photos, you know (Post interview, November 2014).

Alleviate concerns: Teachers also used the multiple modal features, specifically images, to reassure anxious parents. TG explained how some parents in her class wanted constant reassurance that their child was happy and settled at school, and felt photographs in the DD portrayed this more effectively than written comments in the PD:

I think it was lovely for her mum to see her smiling in the photographs and really enjoying the activities, because she goes home and says how hard school is and how she doesn't enjoy it, and to see her fully engaged in an activity, smiling, having a go, having fun, having all these 'manipulatives' on her desk, like it just brings it into reality I think, yeah (Post interview, November 2014).

In another case, the teacher used photographs to reassure parents the child was drinking during the day, something that the parents had been worried about for several weeks (see Figure 4.9). Alongside the picture, she wrote: *"Go CB! You are super clever to remember to drink your water today! One house point on fabulous Friday if you can keep it up. Love Mrs TB!"* (Extract from DD, September 2014).

Figure 4.9: Photograph to reassure parents, with comment

(Extract from DD, September 2014)

The teacher believed photographs were more effective than a handwritten note in providing reassurance as the parents could see the child drinking water. Similarly, when images were received of children looking happy at school in the DD, several parents found this more comforting than a description used in the PD. As PB explained:

> *I think because, especially with her, because she's got you know, challenges, it was nice to see her … you wonder how she is with the kids and it was just nice to see her being able to explain something and be confident enough to do that in front of her classmates* (Post innovation, November 2014).

Personalisation: As well as the content in the DD becoming more learning based, three teachers (n=8) felt their feedback to parents had evolved from being whole class focused to becoming more personalised. As TD shared: *"I suppose I started thinking about what I could have done that was individual to that child as opposed to what, what we were doing in class. So I suppose it's more based on content, isn't it?"* (Post interview, November 2014). TG shared a similar observation:

> *I suppose I used to send a lot of e-mails to the whole year, class group with photographs and little updates as well, so I suppose it just made it more individual like, so it was only about that student and her learning … about her learning journey as opposed to the whole class, and yeah, I guess that's about it really. I mean, I suppose it just encouraged me to communicate more about the day to-day things that you don't usually communicate about. Like, you don't ring home or e-mail every day to say so and so had a lovely day; you just don't do that. Because it was there it was an option, it happened a lot more* (Post innovation, November 2014).

The sharing of more personalised information was made possible by the features of the DD and enabled participants to be better informed about the child's progress.

Better understanding of the child: In the pre-innovation interviews, many of the parents and teachers discussed the need for teachers to develop a good understanding of the child to teach them effectively. It was felt that this aspect was particularly important for children with AN as these children have so many extra needs that need to be addressed before experiencing a successful education. During the post innovation interviews, four parents (n=10) discussed how they sent information about what the child at done at home through pictures. This included experiences the child had been involved in, as well as work the child had completed. In the DD, PG uploaded a picture of her child socialising with her friends in her home environment (see Figure 4.10).

Figure 4.10: Photograph to show the child's weekend activities

(Extract from DD, September 2014)

PK was another parent who used the DD to share an outside school experience (see Figure 4.11), as she explained:

> we'd send a photo of CK with her medal that she got from her hockey, at the end of the hockey season, and then we basically gave a rundown of her … CK sort of gave a rundown of her weekend, what she'd done and what was happening (Post interview, November 2014).

Figure 4.11: Photograph to show the child's home sporting achievements
(Extract from DD, September 2014)

The home to school sharing was a new experience for many of the parents and teachers at the study school, and this type of sharing had not occurred through the PD. However, PK felt it was a significant part of home-school communication as it created the opportunity for teachers to get to know the whole child:

> *I think that actually adds to a child's life as more a holistic balance of a child's life, so I think it's really important, and I think it's really lovely that teachers get to share in what else is going on in that child's life, and I just think it makes them a much more understanding teacher … when you've got all the information about a child, or a lot of it in front of you, you can make better decisions learning wise for that child* (Post interview, November 2014).

TB appreciated the extra information sent from home, that had not been possible through the PD, and explained how she used this to inform future planning and create a more personalised learning experience for the child at school:

we're looking at a holistic approach to learning, having them do something that they're interested in at home, whether it's, I don't know, helping out in the community, something like that, coming back and reinforcing that within our school as well, complimenting them, what they're doing at home and just trying to tie it in with our planning during the classroom (Post interview, November 2014).

Efficiency: Several participants discussed their frustrations with having to wait until the child was at home or school before they could access the PD. As PK explained: "*It's hopeless with her diary … she will forget it, she'll lose it. It's touch and go if she'll bring it home*" (Pre-interview, September 2014). TA agreed with this thought: "*so sometimes when it falls down with students with educational problems, it's because they're not really using it. They're just carrying it around and they're forgetting it or whatever*" (Pre-interview, August 2014). When collecting the PDs for analysis, it was found that one PD had been missing for several weeks and so was unavailable for analysis. These challenges faced with the PD often slowed down or even prevented important information being shared between parents and teachers.

In contrast, many of parents and teachers liked the DD because it offered instant and reliable access to the home-school communication. As PK stated: "*I think it's much, much more efficient to be doing it digitally*" (Post interview, November 2014). PH discussed this point further:

It's just much more efficient, and, and fast. It was quick, you know, it was there instantly, so if you need to get a message to a teacher quickly … or CH, like, if

she's forgotten her hat and if I've got, you know, if I … I can message her from home and say, 'You've forgotten your hat', or I can tell the teacher she's forgotten her hat, or, you know, if she's having problems communicating that she feels sick she can message me and I can then go to the teacher and say … she's not actually feeling that great. So there's that instant feedback that I like with her (Post interview, November 2014).

TB also liked the ability to send and receive messages instantly and found the DD a more efficient tool for sharing information with parents than the PD, as she commented:

I know it sounds stupid, but it takes a good hour to go through those diaries and write back, whereas if you could kind of be hanging onto this during the day, click onto the child and then just say, are you free to meet this day, and just little things like that would be great (Post interview, November 2014).

As the DD was hosted online, participants could use their preferred mobile digital device to access the DD. During the DDI, many of the participants downloaded Evernote onto a device they had regular access to. This meant they could look at entries or add comments at a place and time convenient to them. TD downloaded the Evernote program onto her laptop during the DDI. She explained her reasons for this: "*Just cause it's easy, and it sits on my desk if I'm at work, or it's, it's light and portable and easy to take home*" (Post interview, November 2014). TA shared similar reasons for installing it on her laptop: "*Because it's always open and I've got Evernote on there and it links, so rather than turning on the iPad to do the same thing, I can achieve it on one device*" (Post interview, November 2014). PC agreed that, "*having it between devices was helpful*" (Post interview, November 2014). Using a mobile digital device also enabled teachers to share pictures of the child engaged in their learning while working with the child. This meant parents received a summary of the child's learning just after the activity had finished.

Timely: The accessibility features of the DD described above enabled timelier communication as participants could respond from anywhere, using any device, at any time. In an example from the DD, a parent and teacher communicated four times in one day; twice during school time and twice after school. In this entry, the parent had asked about a particular lesson happening at school so she could ensure her child was fully prepared:

Parent: *Thanks for all that information. When are they doing the big write this week?*

Teacher: *With the athletics carnival we won't get time for one this week. Definitely be back on it next term though :-).*

Parent: *Thanks. Can you let me know which day each week so I can prepare her a bit? Thanks.*

Teacher: *Will do, usually it will be Wednesday or Thursday. I'll make sure I let you know when they girls have a stimulus to discuss. One next term we do "cold" as an assessment piece.*

(Extract from DD, September 2014).

If the conversation shown above had taken place using a PD, it would have needed to travel between home and school over the course of three days; however, due to the accessibility features of the DD, this conversation took place in one day, allowing the parent and teacher to share information in a more efficient and timely manner.

Storage of the data: As discussed, the PD provided limited space for users to write messages and it was common for teachers and other specialist teachers in the school

to attach additional information in the form of notes to the diary. Sometimes these were fastened to the diary and other times they were either folded inside the diary or placed inside the child's bag. This made finding relevant messages difficult and time consuming for parents, as TA explained: "*in the PD you have to flick through and then you may miss some things*" (Post interview, November 2014). PC also expressed frustration with this:

> *I had four notes that had come out of school bags for the two girls, and there were four e-mails, and there was music … one was a music ensemble reschedule/schedule for the next three weeks, because Philharmonic and Concert Band are amalgamating in the new concert, so their rehearsal schedule is different, instead of rehearsing Wednesday they're rehearsing Friday, and next week it's a different way around* (Post interview, November 2014).

The DD showed the potential to store all the data on the child centrally, enabling easy access to the information. As PK shared:

> *I think it would be better to have it all as a snapshot of CK and what's going on in her life in one place, like Evernote, than say, all in a whole pile of separate emails … so I liked that about it* (Post interview, November 2014).

PH also discussed this idea during her interview:

> *It creates a tidy thing, like a tidy program for us to go to and some mini programs, which when you've got a kid that has special needs you can end up having 6,000 different apps to pull up things that would help them in specific ways, it was all kind of in one place, and it was really good … And also, I mean, yeah, there was a video that came home of her doing reader's theatre, and that was … it's just nice to have that connection, but as a tool I can see how that would be really useful for her because I think that's what we'll move more*

towards, is her videoing, or filming some lessons in class, and if that could be incorporated into Evernote then that's just tidy (Post interview, November 2014).

In addition to keeping all information together, the DD entries were organised chronologically, which enabled participants to find conversations that had taken place several weeks or months ago (see Figure 4.12). As TG explained: "*it's so organised. You know, your entries are dated and put into sequential order and you can go back and you can see the journey along the way*" (Post interview, November 2014). PZ compared this feature to other forms of communication: "*you could look back and see what everybody … what had been written, like, last week or the week before, which you can do with a PD, but you can't do with email, or it's harder to do with email*" (Post interview, November 2014). This idea was also commented upon by PH: "*it was easy to go back through and look at past entries*" (Post interview, November 2014).

Angles	5 Nov 2014, 3:09 PM
I am doing this list again this…	27 Oct 2014, 2:14 PM
Note from 20 William Street i…	27 Oct 2014, 12:03 PM
Research note	23 Oct 2014, 10:04 PM
Writing a procedure	17 Oct 2014, 1:41 PM
My list words	16 Oct 2014, 10:31 AM
Today I had a good day beca…	24 Sep 2014, 5:52 PM
Please remember	24 Sep 2014, 4:54 PM
Glass Jar	23 Sep 2014, 5:17 PM
Solar S'more Experiment	23 Sep 2014, 5:17 PM
My weekend!	14 Sep 2014, 9:39 PM
Mental Maths	10 Sep 2014, 9:25 PM

Figure 4.12: Chronological list of DD entries, sorted from oldest to newest (Extract from DD, September-November 2014).

Collaboration

Equal partnership: During the pre-innovation interviews, three parents (n=10) and three teachers (n=8) talked about the importance of communication that went between home and school and school and home. As discussed, participants found the PD limited in the type and amount of information shared. Challenges in sharing information effectively in the PD included: the small spaces provided for writing, the limited information shared, largely based around administration from teachers and basic homework recording from parents and children. Comments made about learning were infrequent and consisted of basic sentences. These comments did not encourage responses from recipients and therefore, communication was mostly one way in the PDs, as PZ shared:

> *I make her write what she does at home in there. But nothing comes home from school. At school, she doesn't write in there 'must do maths investigation'. Or occasionally she'll write in the side 'bring PE uniform' on a day that isn't normally a PE day or something. Something like that. But very little goes in there and the teacher very rarely writes in it* (Pre-interview, September 2014).

However, the features of the DD showed the potential to overcome these challenges and presented a tool in which parents, teachers and the community could collaborate more effectively. In the DD, there was an unlimited area for writing, which meant a larger space within which teachers and parents could collaborate. In one DD, a parent asked for guidance on how to read with the child at home. The teacher responded in the same space with some helpful ways in which the parent could better engage with her child's learning at home:

> Parent: *Just sent her off to get her reading file and fill in the log. Most books she read on her own, do you want her to read out loud or just sometimes?*
>
> Teacher: *With her reading we'd love her to read out loud each night- would be great if you'd also ask her a few comprehension questions or ask her to retell the story in her own words.*

(Extract from DD, September 2014).

Conversations like this were infrequent in the PD and would have required text written outside of the allocated space.

Also discussed, during the DDI, the communication content shifted from basic recording and administration to being more learning focused. Teachers began sharing children's learning through a variety of modalities, which encouraged a greater response from parents, and as a result, more two-way communication based around school learning and home learning occurred. As PB shared: *"I was probably getting information, which was then making me reply to the information"* (Post interview, November 2014). Also, as previously discussed, the information was more comprehensively recorded by participants and many used the different modes, such as photographs to convey more detailed information. As TB summarised: *"I liked the fact that you can put videos, photographs, comments, and you can do it really quickly, and they can read it and come back to you"* (Post interview, November 2014). This two-way sharing encouraged more collaboration between the key people involved in the child's learning.

In one example of two-way communication between home and school, a teacher captured a picture of the child working in maths and literacy (see Figure 4.13). She engaged with the parents by writing: *"CD has worked well on her iMaths investigation this week and worked hard to put previous spelling corrections into her*

sound-mapping booklet this morning. She has also written a great recount about her holidays! :) Well done CD!" (Extract from DD, October 2014). The parent responded by thanking the teacher for the pictures and congratulating the child on their effort, as they wrote: "Thanks for the great photos TD and what fantastic writing" (Extract from DD, October 2014).
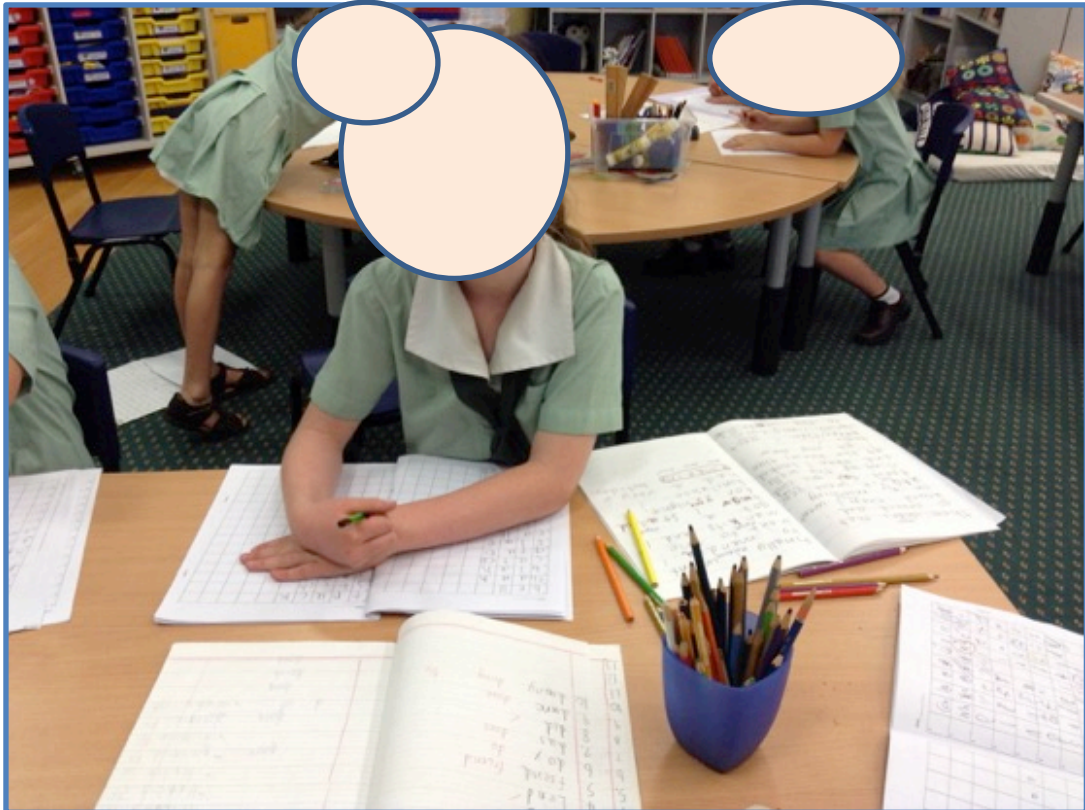

Figure 4.13: Photograph that initiated two-way communication
(Extract from DD, October 2014)

In another example of two-way communication between home and school, a parent uploaded a picture of the child at swimming for the teacher to see (see Figure 4.14). The teacher engaged with this experience by replying: "*You look really cute with wet hair and your goggles on! We want to go to this place! Tell us about it tomorrow!*" (Extract from DD, September 2014).
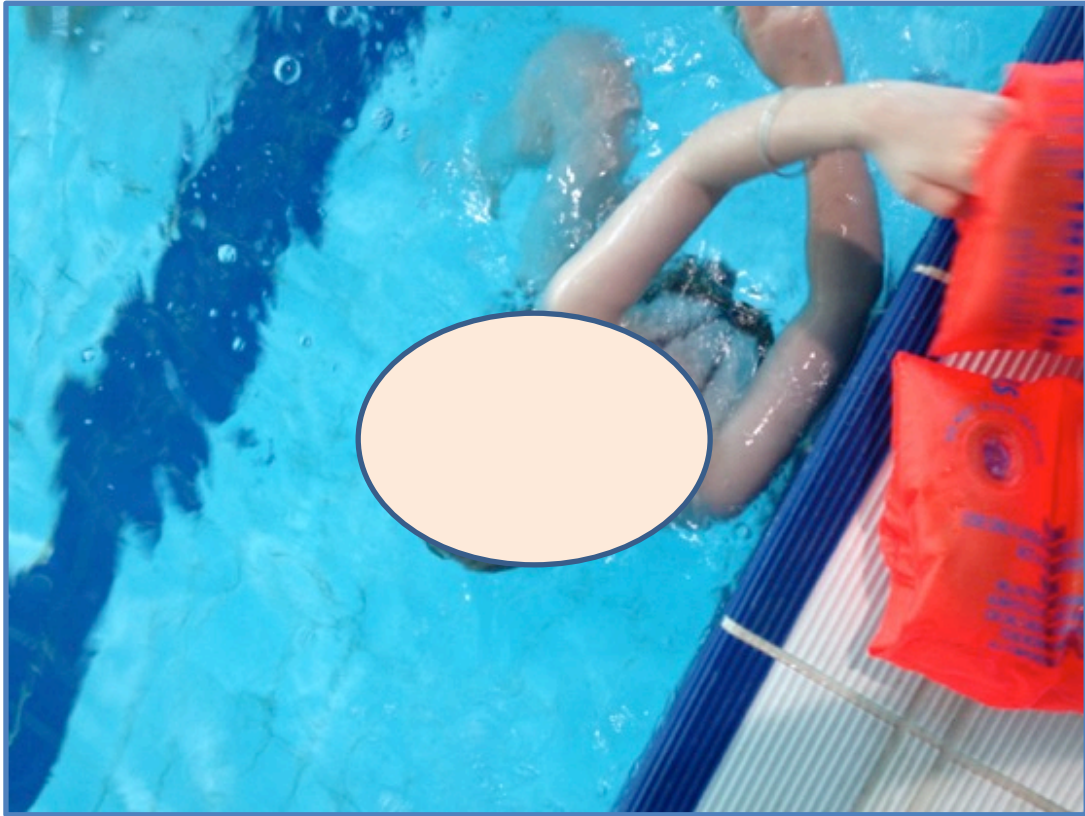
Figure 4.14: Parent sharing a child's out of school experience
(Extract from DD, September 2014)

In the first example, the parent learned about what the child's learning at school and in the second example, the teacher learned about the child's out of school interests. Both diary entries were acknowledged with a detailed response from the recipient. These types of interactions had not been possible through the PD and showed to significantly aid collaboration between parents and teachers. Both parties shared a meaningful learning activity and that sharing was acknowledged with further comments made by the recipient to show the entry had been read and valued. For the first time, parents began responding to comments from teachers and initiating their own conversations. Two parents (n=10) shared how they sent information back to the teacher about the child's learning at home: *"I responded to those things and I sent information about appointments or if you were having trouble with something, or what I'd been working on at home, which is I suppose a bit more than what I would normally send"* (Post interview, November 2014).

Two parents (n=10) and one teacher (n=8) shared how they did not receive much information from their parent or teacher and so this discouraged them from using the DD. As PK explained:

TK never really responded to anything that I had put onto Evernote, so I'm not sure how much she was using it to gain information, because I'll try every now and again to re-inject some enthusiasm into, you know, using at as a means of communication, but it just didn't seem to work between the three of us very well at all (Post interview, November 2014).

TB shared a similar experience:

I started off doing it quite often, but then it … I realised that it wasn't being read, so I sort of stopped, and I also spoke to PB and she indicated that she wasn't using it as well, and that was … that sort of ended if for me, really, but in saying that, I loved using it (Post interview, November 2014)

Community: A communication tool that facilitated collaboration beyond the parent and teacher was identified as particularly important for children with AN, as many have a range of specialist professionals working with them. In the pre-interviews, one parent discussing this area felt the paper diary did not promote effective collaboration as it could only be accessed by one person at a time: "*Because with paper it only goes to one person … And then that has to be communicated beyond that one person if you want it to go past that person*" (Post interview, November 2014). At the study school, sessions with specialist teachers were often in isolation, as information was rarely exchanged between the specialist teacher and the child's classroom teacher. Several of the parents commented on their desire for shared communication between the specialist teacher, class teacher and parent. As PA said: "*CA has good communication*

with 'specialist teacher', which is fantastic. But that doesn't necessarily translate to the classroom" (Pre-interview, September 2014).

However, when reflecting on the ability of the DD to facilitate effective collaboration beyond the parent and teacher, five parents (n=10) and five teachers (n=8) believed it had the ability to include everyone in the communication. As PK explained: *"I thought, well, if I put it on their Teacher A can see it, Teacher B can see it, Teacher C can see it, and you know, whoever needs to see it, it can be on there and can see it"* (Post interview, November 2014). TJ shared similar thoughts: *"Because you could see exactly what everybody had written and then share your own stuff. So, yeah, it was good"* (Post interview, December 2014). PZ also shared how the DD could be shared with more people if needed: *"because you could always invite more people if someone else needs to be involved, like the head of, say the head of Learning Support"* (Post interview, November 2014).

During the DDI, one specialist teacher shared a child's reading progress, using a video. Although the teacher was unable to attach the video to the DD, the video clip was sent home on the iPad for the parents to watch, as she wrote: *"Reading Working so well with toe by toe … we are over half way … yay! We have taken a video but cannot attach it. Take a look on the iPad when CH gets home"* (Extract from DD, September 2014).

In another DD, a parent uploaded images of the session for a teacher to view (see Figures 4.15-18):
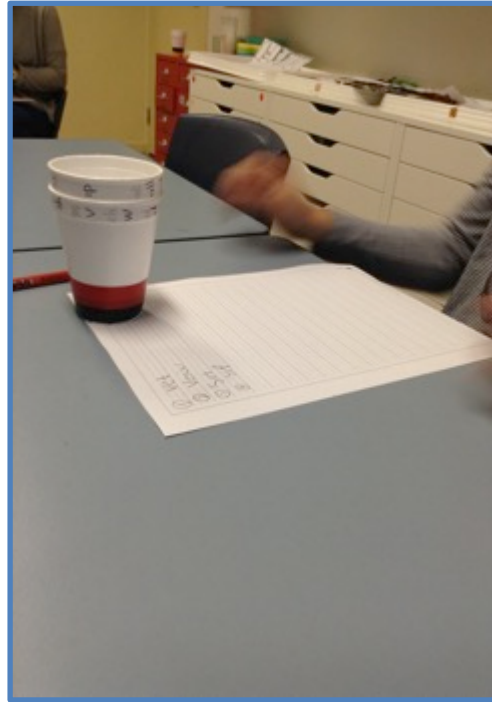
Figures 4.15-4.18: Series of photographs to show the teacher what the child is doing at her specialist lesson (Extract from DD, September 2014)

Prior to the DDI, no communication had taken place between the specialist teacher, parent and class teacher. However, having all the relevant people on one

shared platform facilitated a more collaborative approach to the child's development, as everyone could see comments written about the child, keep track of the child's progress and add any relevant information.

Child involvement

Although child involvement was not a theme identified by the participants, it became apparent, when analysing the data, how much the DD had facilitated the involvement of the children. Therefore, this theme will be discussed in reference to the PD and the DD.

When discussing the child's use of the paper diary, one teacher felt the paper diary had benefits for developing the child to develop some responsibility, as she shared:

I like the diaries because the emails are coming from the parents and the diary, the girls can take some ownership about I've got this note or I need to find out about this so ties in with responsibility (TH, Pre-interview, August 2014).

Another teacher felt the paper diary was important to help develop organisational skills: *"But also, the other part to the diary is the opportunity for students to practice being organised and start managing their own academic goals and behaviours" (TA, Pre-interview, August 2014).* Although five children (n=9), participated in the PDs, their participation was sporadic and at a basic level (see Figure 4.19).

Figure 4.19: Snapshot of a child's participation in the PD
(Extract from PD, July 2014)

However, many of the children, whose parents and teachers were in the study, had not engaged in the PDs. One reason for this was because of the child's difficulties with handwriting tasks. Three parents (n=10) and three teachers (n=8) described how it would take the child a long time to write the words required. If the child was successful in writing the note, parents often struggled to read the child's writing at home (see Figure 4.20).
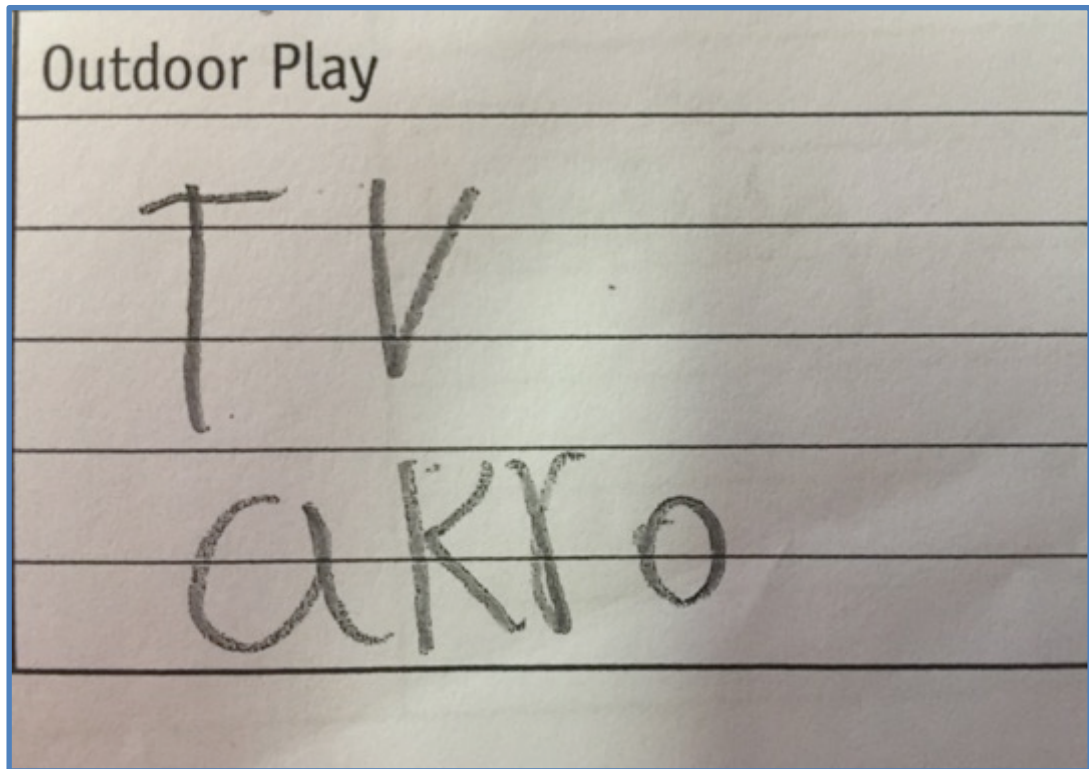
Figure 4.20: Child's recording in the PD (Extract from PD, May 2014)

As PJ summed up: *"CJ has got an allergy to pen and paper"* (Post interview, November 2014). PH explained the problem in more detail: *"if she's left to write it in her book, which takes a long time, she often doesn't finish what she needs to write"* (Post interview, November 2014). TA shared how children struggled to write in the PD, due to their difficulties with writing, but also because they often forgot what they were supposed to be writing:

> *We have the physical paper diary, which is for all students, which can be problematic for students with educational problems in that their writing skills are poor, they might have dyslexia or be able to actually remember to put things in without being prompted all the time* (Pre-interview, August 2014).

In addition, one teacher felt the PD excluded the child from the communication process, as often the child did not read what was being written. As she shared: *"because if you write a note in the diary you don't necessarily show them*

unless it's a positive, a real positive, and you want to boost them" (TG, Pre-interview, August 2014). She found the same to be true for all current communication methods being used at the school, including email and phone calls. TH agreed that the PDs were difficult to understand for the younger children and so posed a barrier to their successful participation in the communication process. Because of these challenges amongst others, many of the children did not engage in the PD. As PA shared: *"You know, the paper diary for CA I don't think has been touched since first term"* (Post interview, November 2014). TA added to this and explained how this was sometimes a problem for children with AN:

> *So if the student has got the diary but isn't actually putting anything into it, it's just a book they're carrying around with no value. So sometimes when it falls down with students with educational problems, it's because they're not really using it. They're just carrying it around and they're forgetting it or whatever* (Pre-interview, August 2014).

During the DDI, more children became involved in the communication process, even though they had not used the PD for communication and had not been expected by the researcher to contribute to the DD. The reason for their involvement was because of the accessibility and multimodal features inherent to the DD. The accessibility features provided support for the children's writing and reading of comments. Additionally, the multimodal features enabled children to see personalised visual feedback from parents and teachers, as well as presenting them with alternative ways to communicate, such as photographs.

Accessibility features: The DD was a more accessible communication tool for children as it provided better support for recording. As PJ explained: *"IT has huge benefits for her. She has huge issues with writing … So the fact that she can pull up a virtual keyboard and get a notepad out … has been a big step forward for her"* (Pre-interview,

September 2014). Recording electronically also made the writing process quicker for children, as discussed by PH:

> *And then she doesn't remember because she's taken so long to concentrate on each letter, so it's good if she can type it, she types faster; and then there's that autocorrect that helps her and that speeds her up even more, then I think she would probably have less trouble writing the entries in* (Post interview, November 2014).

The autocorrect function on a device was also commented on by PJ: "*I think she also likes the fact that the iPad's got self-correcting mechanisms*" (Post interview, November 2014). In addition to the recording benefits presented by the DD, when notes were typed rather than handwritten, they became more legible for teachers and parents, as discussed by PA: "*and also for her awful handwriting, if it's on a DD everyone can read it*" (Post interview, November 2014). One teacher commented on the ability to gain a deeper understanding of the child's ideas when notes were typed:

> *For me I can also see in a greater depth of detail in terms of what CA is looking at, thinking about than I can get from a PD because it relies on her handwriting which is not very good, and so it takes that away from the equation and it allows you to actually get into the depth and detail, so that's been good* (TA, Post interview, November 2014).

To support children who struggled to record information quickly, teachers also used the photograph feature of the DD to capture information written on the board (see Figure 4.21).
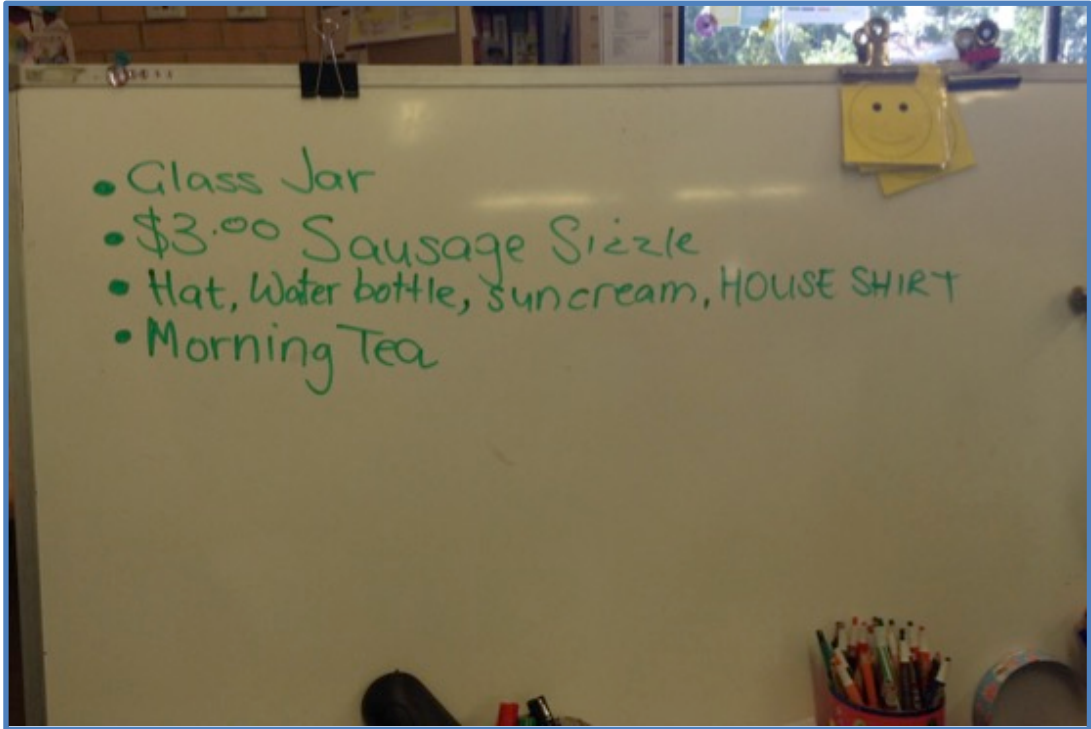
Figure 4.21: Photograph of reminders

(Extract from DD, September 2014)

One child found the audio feature of the DD useful during the innovation. She had been struggling to write a story at home; however, the audio feature offered an alternative way to record her ideas. PK shared:

She'd written one chapter and she just could not go anywhere from there. And so we just said to you, okay, well, stop thinking about writing it, so just … let's record it, just record your voice, and as we talk about the story and you tell the story to the recorder, or to the phone, and then we'll go back and play it back, and then you can write the story, because then you've got the story that you're telling. And so her way of learning and her way of being able to process was amazing. Once she had the story in her head it was all there, but she couldn't write it. She couldn't get it out from, you know, head to pen, but she could easily get it out from head to mouth to, you know, tell the story … It made her go, 'Wow, that's really cool' (Post interview, November 2014).

In addition to the accessibility features of the DD, the multimodal features presented a more visually appealing and familiar interface and as a result, more children engaged in the DD than the PD. Teachers and parents commented on how much the children liked seeing their photographs in the diary, and felt these images provided more meaning to the communication process (see Figure 4.22). As TG shared:

> *She has, you know, such a low self-esteem and a low sense of self-worth, so to see her look back and reflect on all of those wonderful things that she can do, it really boosted her confidence. And she loved the fact that it was technology, it was digital, you know, it was her iPad, it was nobody else's, it was hers, and she loves that, yeah, which is really cool* (Post interview, November 2014).
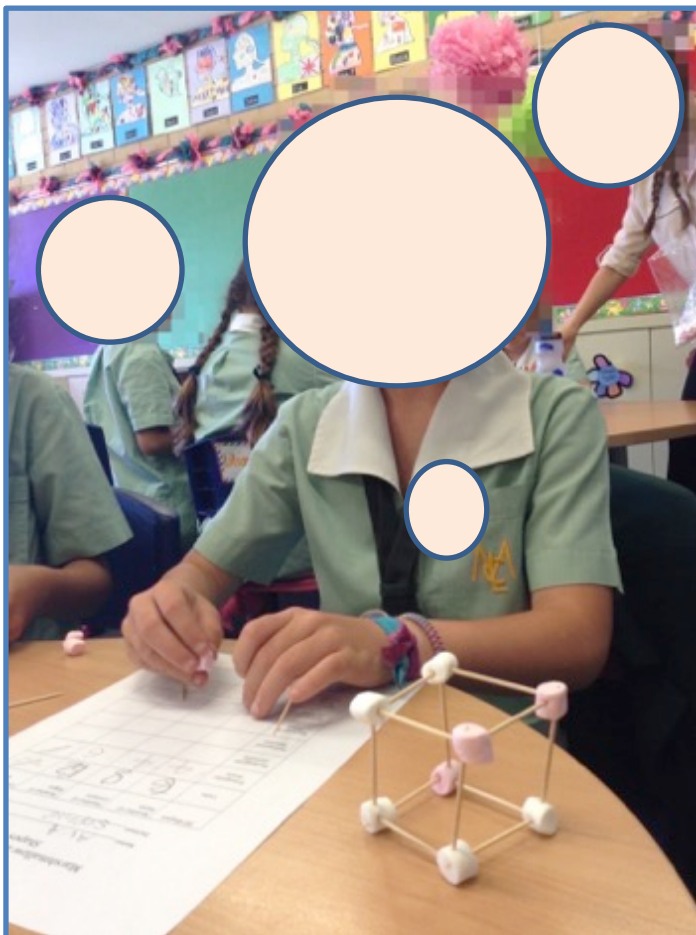
Figure 4.22: Example of a photograph the child liked to look at in the DD (Extract from DD, October 2014)

PD added similar thoughts: "*she loves, anyone loves, kids, especially of this generation love to see themselves in photographs*" (26/11/14). PY felt it benefitted her child, as she was able to feel a sense of achievement through looking back at the photographs of her work (See Figure 4.23): "*No, she was quite interested, and she's quite visual too, so it's quite good to be able to see them and be proud of her work and what she's done*" (Post innovation, November 2014).
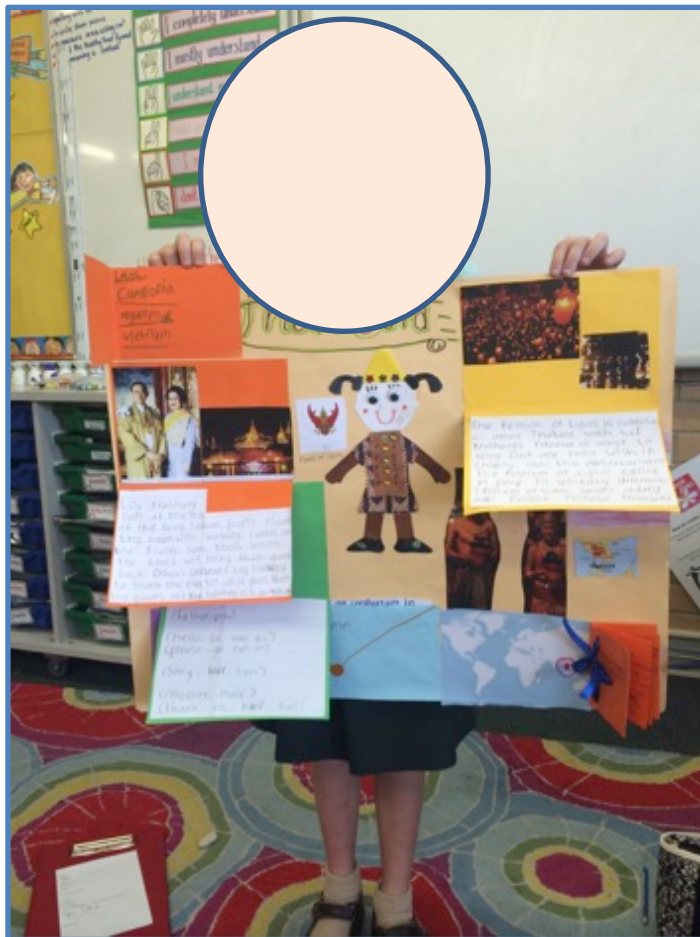

Figure 4.23: Photograph of a child feeling proud of her work

(Extract from DD, September 2014)

Additionally, one parent shared how the images and videos had enabled her child to share the learning with her siblings: "*Yeah. So they were watching it and I think there were sitting and having a giggle with her, and it was really nice*" (PH, Post innovation, November 2014).   Another child began videoing herself at home and sending video messages to her friends:

Since Evernote, she has actually started videoing herself at home … And I wonder if that's because she's seen it happening at school … yeah, she seems to have taken a leap with her use of technology that previously wasn't there … She keeps taking my phone … She prepares herself and she's sending it to her friends, which wasn't a concept that she grasped before she had used Evernote (PH, Post innovation, November 2014).

Several children began using the different multimodal features to communicate with their teacher and/or parents. TG talked about how much her child enjoyed taking pictures, which were then uploaded to the DD:

She took lots of photographs of herself and her friends playing, or they did a lemonade stand, she took a photograph of that, and then at the daddy/daughter dance she took those photographs and put those in for me as well (see Figures 4.24 and 4.25). So yeah, so she did, she took some photographs, and a couple of times I asked her some questions and she answered them, so yeah, she did enjoy using it (Post innovation, November 2014).
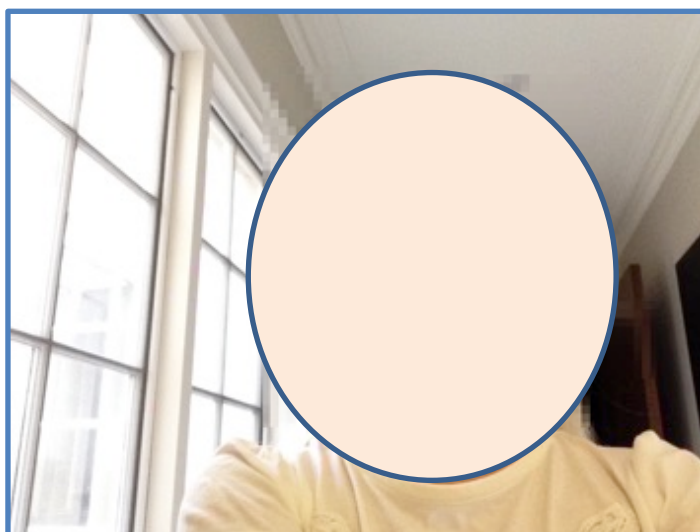
Figures 4.24 and 4.25: A child showing her teacher a recent experience using photographs (Extract from DD, September 2014)

TJ felt her child was really starting to understand the concept of sharing learning through the multimodal features and believed that with time, would have become an active participant in the communication process:

She enjoyed doing the checklists, after I suggested that, a couple of photographs, because I encouraged her to share her learning that way. She didn't quite understand that concept. She was getting there. So with more time, it would have been nice to share some more learning (Post innovation, November 2014).

In the case above, the child had not participated in the PD communication and left it to the parent to write any communication in the PD. However, during the DDI, the child took an active role in the communication process. PA discussed another child who had become fully involved in the communication process using the different multimodal features: "*Funny photographs, there was memos, everything, so she … I think she really enjoyed it*" (Post innovation, November 2014). TG felt the child became involved in the process as the communication was more interactive and they were made to feel part of the process, rather than being the person delivering the PD between home and school. She shared an example where she had created a list of tasks for the child to work through:

✓ *Maths* ✓ *Spelling* ☐*Aurasma* ✓ *Poem* ✓ *Diary*

(Extract from DD, October 2014)

It made it interactive for her so she could then go away and tick things off, answer my questions, add photographs of herself so that she felt part of the process too, not just being this delivery person taking it back and forth (Post innovation, November 2014).

The DD offered a more accessible tool for children with AN because of its recording and organisational features. A further reason participants felt the DD was used more was because of its familiarity for children. Many of the children in the innovation had grown up with mobile digital devices being used regularly at school and at home. As PK explained:

I think for CK, going digital for CK is the way to go with almost everything. She just, she operates really well on that platform, and she probably is given that they're all growing up with it now, from sort of almost babyhood through, so yeah, I do think that it would help her going forward. I still do feel really positively about, you know, something like it, working for (Post interview, November 2014).

PJ was another parent to comment on how much their child preferred using technology, in particular the iPad, rather than using paper, as she explained: "*But because CJ likes her iPad, and she certainly prefers it over any paperwork, if she can do it on the iPad, she will, so for whatever reason the technology seems to be successfully addictive*" (Post interview, November 2014). TD found the child in her class was more likely to record her work using Evernote: "*for CD, the expectation has been 20 minutes of reading every night, and it's not been recorded, and I think having that, having that recorded on Evernote or something that was a bit more fun for her*" (Post interview, November 2014).

It is clear that the children who became fully involved in the DDI were those who received support from either their teacher or their parents. As PJ explained:

CJ's primary enjoyment was just the fact that she had her teacher at the other end, you know, the fact that she was there, and I don't think she quite realised that when she was a few times with me sorting out e-mails and I'd send the e-mail off, I think because this was her protocol and because her teacher had

spoken to her about it and shown her at her end what she was doing, and encouraged CJ to use it, that it was a personal interaction between the two of them, and I think that that … if anything won the day I think that had quite a large part to play in getting CJ on board (Post interview, November 2014).

TG worked to involve the child in the communication using the checklists, as she shared:

with the tick box, it made it interactive for her so she could then go away and tick things off, answer my questions, add photos herself so that she felt part of the process too, not just being this delivery person taking it back and forth (Post interview, November 2014).

However, those children who did not become involved were children who did not receive any support, as illustrated by TK: *"CK did use it occasionally. She set a few reminders. I just couldn't monitor it effectively as I didn't see her much this term"* (Post interview, December 2014). During her interview, PC discussed the need for children to be taught and supported with their involvement:

Well, to be honest she's not that great at filling in the paper diary either. I have to help her write down what she's done, anything, if she has. I don't know. I think it would be … if that was the only form of communication then it would be important for us to teach her to use it (Post interview, November 2014).

Parental engagement

For this study, parental engagement refers to the parents engaging with their child's learning at home. During the pre-innovation interviews, parents and teachers shared that if the parents were better informed about the child's progress at school, they would be able to support the child more effectively at home. As discussed in previous sections, the PDs provided limited information about learning and although

parents tried to find out from their child information about their school day, these attempts were often unsuccessful because of the child's memory retention skills and/or ability to convey enough information to the parent.

However, all the DDs analysed contained entries relating to work completed at home. Most of these entries were significantly more comprehensive compared with the PDs and many of the DDs had used multimodal features as part of the description, as discussed previously. The key areas in which parents engaged with their child's learning was through *daily discussions*, *revisiting learning, reading at home, self-organisation* and by *creating learning opportunities.*

Daily discussions: Three parents talked about the limitations of the PD, when helping parents to engage with their child's learning at home. PH and PY commented on the lack of conversation being generated from the paper diary, because of the limited information. PH shared how there was little information provided and when the child was asked, they could not remember their day. PY expressed a similar feeling:

> *I suppose what they might be covering at school, what they might be learning. Because it would be quite good to be able to incorporate that at home as well, and talk about it. So you can have a bit more of a conversation, say, at dinner* (Pre-interview, September 2014).

However, because of the detailed information shared through the DDs, parents could find out what their child had been learning about at school and base home discussions around this information. Most of these discussions were based around the pictures that had been uploaded by teachers (see Figure 4.26). As PH shared: "*It gave her the opening to talk about her day, and that never happened*" (Post interview, November 2014).
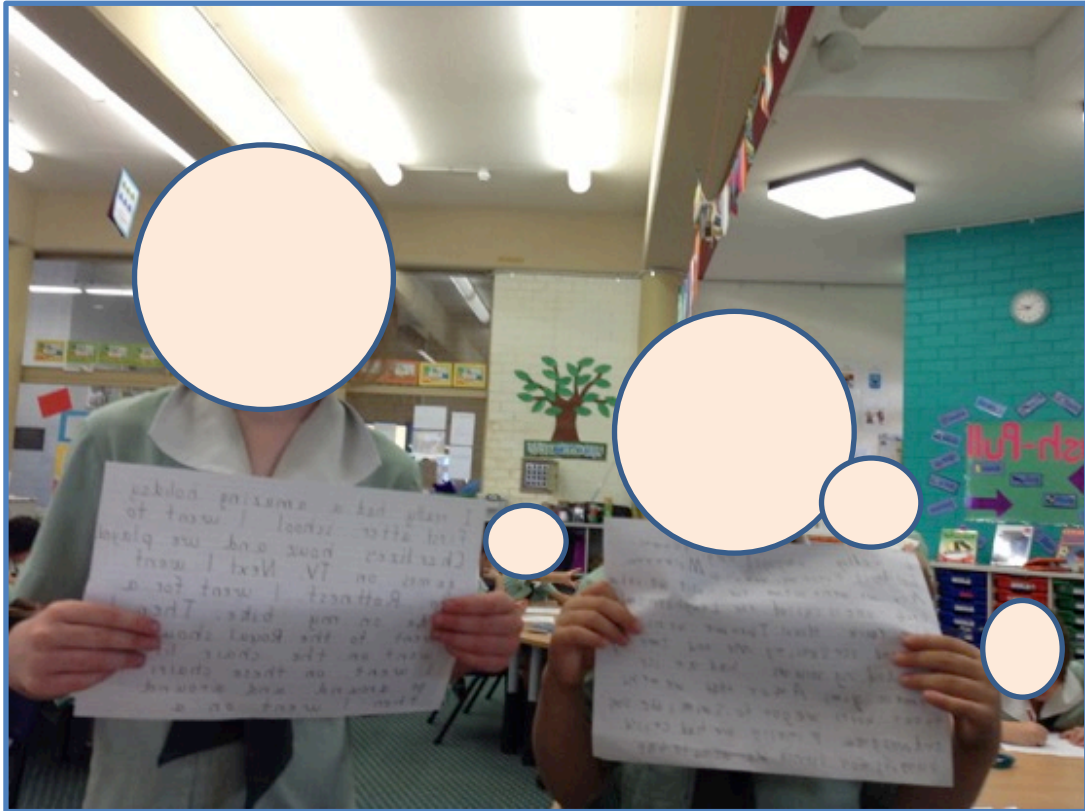
Figure 4.26: Photograph that received a positive response from a parent
(Extract from DD, September 2014)

This aspect was commented on by four parents (n=10) and one teacher (n=8). As TG shared:

> *CG responded really well to it and, you know, she loved having her iPad and sharing the things that she'd been learning in the class and specially because … one of CG's issues is finding it hard to convey what she'd done throughout the day, and she finds it hard to be positive, so I could put in there all the positive things that she'd done so that she wouldn't just focus on the negatives, so she could actually go back and reflect that actually I did have a really good day, and this is* why (Post interview, November 2014).

PH also enjoyed sharing in her child's learning at school and explained how the information shared in the DD was in direct contrast to that shared in the PD:

With the paper diary, there's nothing to go with that. And you can prompt and they go: 'Mmm, I forgot what we did today' [Laughs]. But that was really good, she was really proud to show us what she does in class (Post interview, November 2014).

In the following example, the teacher shared pictures of the child writing and then reading out her narrator role in a drama session (see Figures 4.27 and 4.28). The parent responded to the multimodal message, sharing how feedback from the teacher enabled further conversations about learning to take place at home.
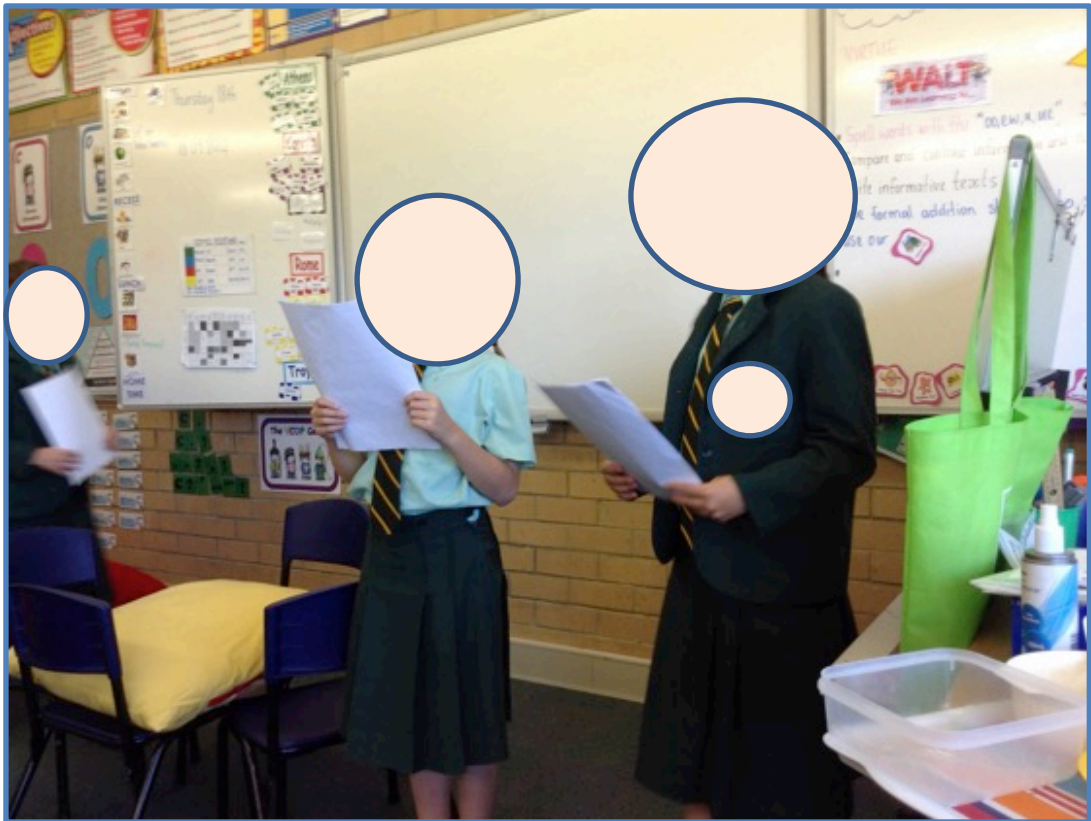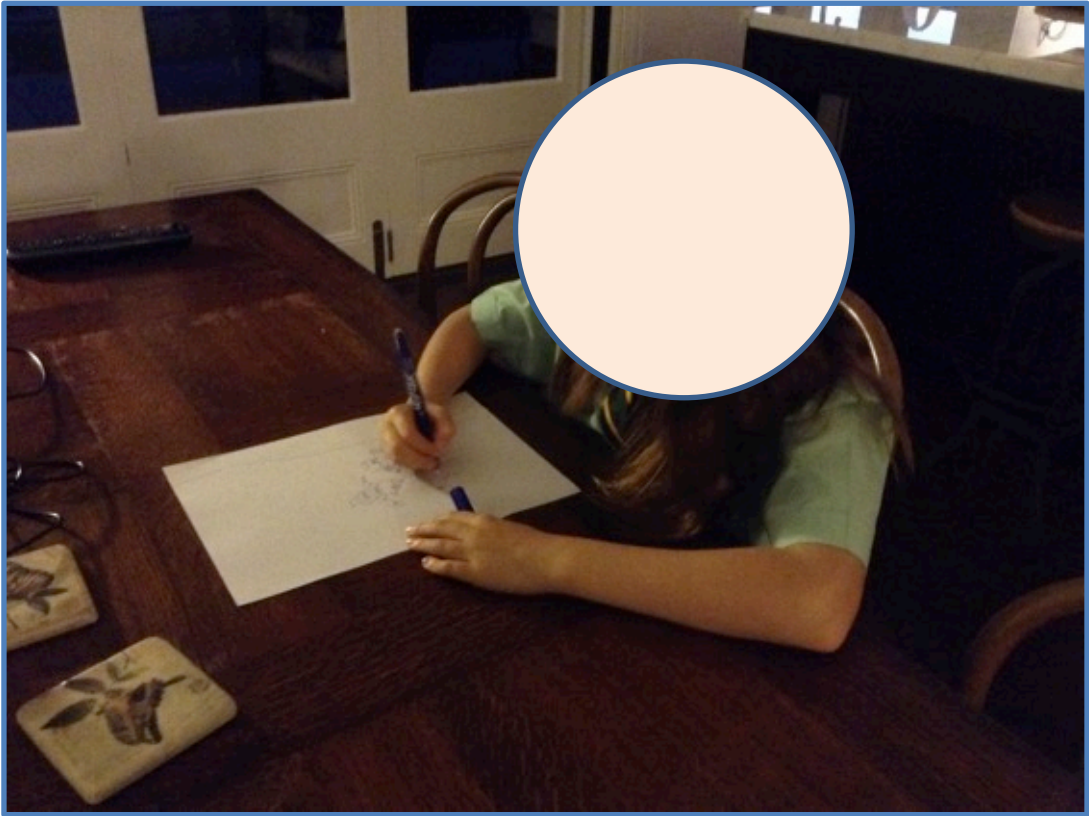

Figure 4.27: Example one of a picture uploaded to show classroom learning (Extract from DD, September 2014)

Figures 4.28: Example two of a picture uploaded to show classroom learning (Extract from DD, September 2014)

Additionally, two parents, including one who was already discussing learning at home with their child, provided feedback to the pictures that had been uploaded to the DD. In one example, the parent had responded: "Thanks for the great photographs TD and what fantastic writing" (PY, Extract from DD, October 2014). This style of communication had not occurred in the PDs.

Revisiting learning: PC was one of the three parents who discussed the limitations of the PD in facilitating parental engagement. She felt if she learned more about what her child had been doing at school, she would be better placed to support her child's learning at home:

Sometimes I'm a bit unsure as to for CC, exactly what they're working on. We get the big long IEP of her maths goals and her literacy goals but I'm unsure as

to exactly what is being worked on at that particular point in time. Because she's got a couple of different literacy support and numeracy support teachers. So I suppose I can ask but it would be actually nice to have that this week we're working on or in the next four weeks we're going to be working on X, Y, Z so I can back that up at home (Pre-interview, September 2014).

Although eight of the PDs had entries relating to homework (n=9), in most cases, the comments provided were basic, with parents recording the subject studied and in some cases, the time allocation (see Figure 4.29). Rarely was any feedback provided from the parents.

Figure 4.29: Example of a basic homework recording completed by a parent in the PD (Extract from PD, May 2014)

However, in six of the DDs (n=10), parents had provided detailed feedback on work they had covered at home with their child, like this example:

She also got stuck into finishing her history letter as soon as she arrived home (liked having 'homework' like her big sister!) I have gone through it with her and we edited it for punctuation and sentence structure. I have also loaded a couple of her family trees for her to share with you. They are her paternal great grandparents' trees! (Extract from DD, September 2014)

PD was another parent who provided more detailed feedback on her child's homework activity, as she wrote: "*CD worked on Wordshark and did the spelling test. She got 8/10! Let's hope with practice in the classroom we see a slight improvement. She was proud of her maths today*" (Extract from DD, September 2014).

Several parents uploaded pictures alongside an explanation to show what the child had completed for homework (see Figure 4.30). This type of sharing had not taken place prior to the DDI.
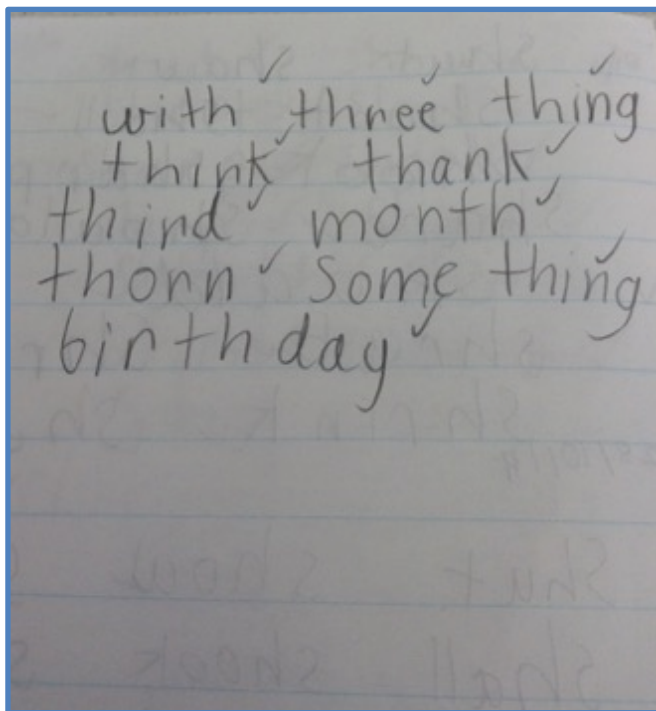

Figure 4.30: Photograph taken by a parent to show the homework outcome (Extract from DD, November 2014)

One parent (n=10) and one teacher (n=8) discussed this area further and explained how the DD could further support the child's learning at home. As PH shared:

It was more reflective but I can see how it would be really good because she does have short-term memory issues and if there are things that she's learning in class that she can't … is struggling to get the first time around, if she's able to hold it up and video it and then bring it home, then we can read or listen to it with her and help explain things and just give her more opportunities to hear what is being said. So in that way I could see the potential (Post interview, November 2014).

TI had similar ideas:

Like, even taking photographs of the steps that you have to do, on the board, or recording instructions from a teacher, I guess, and then replaying them once she's done step three what was next. So I can see that being beneficial (Post interview, November 2014).

Additionally, in two of the DDs (n=10), parents had requested homework from the teachers and in some of the DDs, teachers had tried to encourage parental engagement through the homework task (see Figure 4.31). Although this diary entry has been used previously, in this instance the entry is being used as an example of parents of requesting homework. Neither of these conversations had taken place in the PDs analysed.
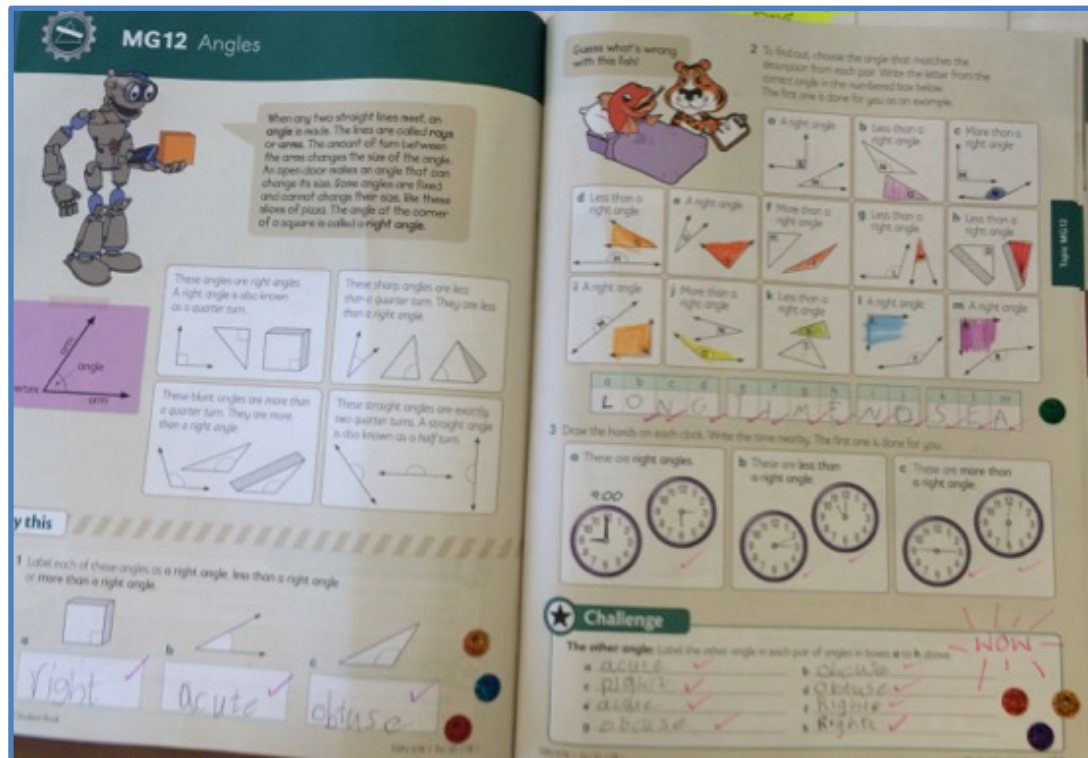
CG is learning to identify angles and she is so good at it! She knows the difference between a right angle, acute angles and obtuse angles. Today she did her mathematics tasks all on her own and achieve 100% accuracy. I am so proud of CG.

CG, show mummy how to make these angles. Use two small sticks as the arms or rays.

☐ *Right Angle*
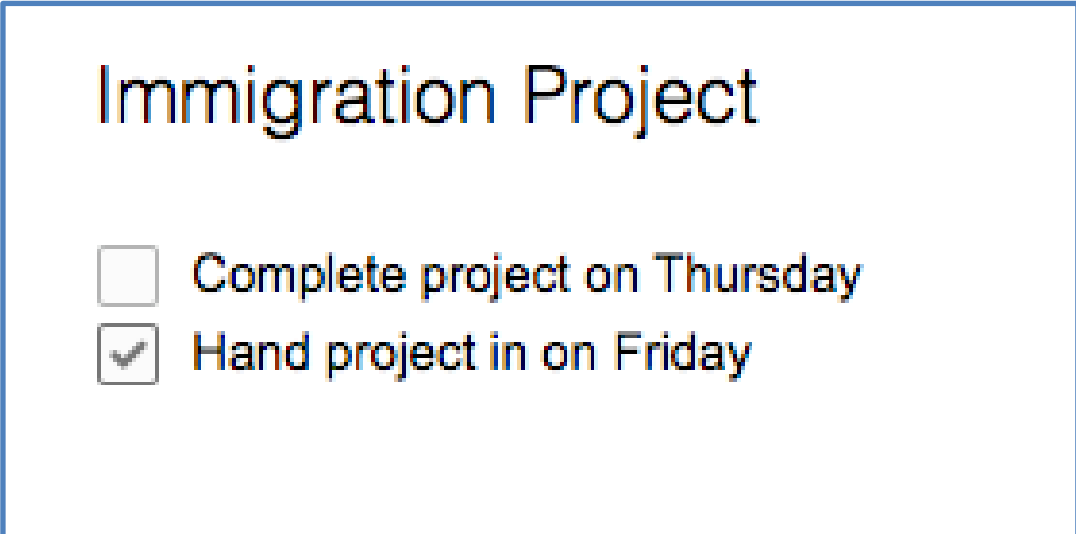
☐ *Acute Angle*

☐ *Obtuse Angle*

Figure 4.31: Photograph used alongside DD entry

(Extract from DD, November 2014)

Reading at home: Like homework, the reading section of the PD was used to record basic entries, which mostly included the name of the book and pages read. Rarely did parents provide any additional information.

However, in four of the PDs (n=9), comments were made relating to the child's reading progress at home. As PY wrote: *"CY just did a great job of reading Animal Feathers up to page 14* (Extract from DD, November 2014). PH also shared reading covered while her child was home sick: *"CH has kept up with her reading practice while at home. She finished the novel she started and has been writing and drawing when she felt well enough"* (Extract from DD, September 2014). Additionally, several teachers again wrote comments to encourage parental engagement in reading at home. As TD wrote: *"I would really love for CD to continue reading every night and ensure that she records her reading in her diary. Well Done CY!"* (Extract from DD, September 2014).

Self-organisation: Another way in which parents engaged in their child's learning at home was by supporting their child with self-organisation. In four of the DDs (n=10), parents had created checklists to support their child in time management (see Figure 4.32).

Figure 4.32: Example of a checklist created by a parent

(Extract from DD, September 2014)

Parents who had created checklists for their children found they helped to organise their child, as TJ shared: "*The checklist was really good at organising and helping her realise what she needs to do*" (Post interview, December 2014).

Checklists were used by parents to act as reminders for the child, and help their organisational skills. In her child's diary, PC wrote:

> *This Note is for CC!!!*⬚⬚⬚⬚
>
> *CC, can you please bring home on Wednesday:*
>
> ⬚*New readers for home*
>
> ⬚*Percussion music books for home practice*

(Extract from DD, September 2014)

PD commented on the usefulness of checklists for keeping records of reading in comparison to the reading records kept in the reading section of the PD:

> *The teacher did write on a couple of notes, you know, different books that CD was to read, and you know, she wrote them and we ticked the box … they have a section where we've got to put a reading log, and I'm really poor at recording what books my child has read even though she reads every day, you know, because it's just another thing to remember* (Post interview, November 2014).

When reflecting on the effectiveness of checklists, PA felt they had supported her child in becoming more organised, as she reported: "*me sending her, 'remember to tidy up', and giving her a little checklist to try it out and things like that, which she'd then use, which was good*" (Post interview, November 2014).

Creating learning opportunities: Creating learning opportunities was a new way in which parents showed to engage in their child's learning during the DDI. Although this was not shown in the PD, in four of the DDs (n=10), parents discussed learning opportunities that had been created for the child separate from their homework. PK had been taking her child to a sports activity, which the child had excelled at. This experience was shared with the teacher (see Figure 4.33).

Figure 4.33: Example of a learning opportunity created by the parent
(Extract from DD, September 2014)

PZ shared how she had been working on areas she felt her child needed extra support with: "*CZ has completed Mathletics on Friday and again today. I will continue to revise area, volume and probability with her over the coming weeks*" (Extract from DD, September 2014). Additionally, PC had found riding lessons for her child to attend,

as well as supporting her with some ICT based work, all of which was shared with the teacher via the DD: *"She has been constructing an equestrian centre in Minecraft, which is amazing! You might want a look!!"* (Extract from DD, September 2014). Also, PY had booked her child in for some art lessons, to which the teacher had provided an enthusiastic response: *"It is great to hear that CY might be doing some Art with Mrs A in the holidays. She is such a talented artist!"* (Extract from DD, October 2014).

Having access to the DD via a mobile device encouraged more sharing of outside school learning, as parents sent messages while the child was engaging in their activity, as illustrated by PK:

No, it's with me, it's just with me all the time, so to me it's the first thing I would reach to, for … and usually, I've got my phone in my hand when I'm thinking of something that I want to note down, or if we're out, say for instances … the end of her hockey season, I said, 'hey, why don't we take a photograph and show your teachers what you did, and they'll be really proud of you and it's a really good achievement', and so she was all excited about doing that, so my phone was with me so it was not … I wasn't grabbing another device to get onto to do it, I was just doing it on the spur of the moment with my phone, so that's probably why I'd use the phone over anything else (Post interview, November 2014).

The sharing of outside school activities provided teachers with some information about what the child had been doing for the first time. Additionally, it gave teachers a chance to learn about their child's out of school interests and enable them to make links in learning between home and school for these children.

Additional thoughts on the digital diaries

Several teachers commented on how much they liked using the range of multimodal features as part of the communication between home and school. As TB

shared: "*I liked the fact that you can put videos, photographs, comments, and you can do it really quickly, and they can read it and come back to you. I love … the bullet points, the reminders*" (Post interview, November 2014). TG shared a similar enthusiasm: "*Yes, yes, photographs, and then I really liked the tick box challenge, challenge type stuff thing to do as well. I would have loved to have done video*" (Post interview, November 2014). Several participants felt the multimodal aspect added a new dimension to the home-school communication process. As Teacher TJ explained: "*the fact that you can do photographs, videos and writing and checklists was, you know, it's all different ways of showing learning*" (Post interview, November 2014). TA was another teacher who enjoyed using the range of multimodal features: "*I did like the fact that you can capture different media. I also like the ability to quickly type in and create check lists for things, reminders*" (Post interview, November 2014).

Photographs were captured and shared in nine of the DDs (n=10). Parent PY enjoyed the photographs and could see great potential in the video feature of the DD:

I think that the DD is a lot better because you can do … there's a lot more you can do on it such as photographs, and I never used the video on it, but I can imagine that would be really good if, say, a child was telling news, and you couldn't be there, then that would be really good (Post interview, November 2014).

Another parent particularly liked the visual dimension video and photographs provided: "*I really do like the idea of putting videos, and I really did like the idea of putting photographs on and sharing life situations, so I think that's great*" (PK, Post interview, November 2014).

Video was only used by a minority of participants and it was agreed that this was a more complex process as video had to be compressed before being uploaded to Evernote; however, the participants felt with more time and support, this could have

become a key means of communication. Checklists were generally used for reminders. Although other features, such as links and audio recording were not utilised much, participants could see the benefit of their use and felt, given longer, these could have become part of the communication process too.

It is clear the features of the DD facilitated more opportunities for parents to engage in their child's learning at home. As PB explained: "*the [paper] diaries can be a bit hit and miss and sometimes you get, you know, a little tick or a smiley face for the day, or, and you know, you don't really know what's going on ... So these [DDs] are a little bit more informative and you know, it's a nice way to get it as well*" (Post interview, November 2014). Receiving timely and more detailed communication from teachers enabled parents to feel more involved in their child's learning and provided more ways in which they could support their child at home. As PY shared: "*it's constant and ongoing, and there's feedback, and you can talk, have conversations around it*" (Post interview, November 2014).

Additional thoughts about Evernote as a communication tool

Prior to the DDI, parents and teachers had some pre-conceived ideas on the challenges that would be faced in the DDI. Some of these came to be realised and others did not. The following additional observations from study participants provide a useful insight into the considerations for implementing a DD to support home-school communication.

Time consuming: Five parents (n=10) and four teachers (n=8) believed the DD would be more time consuming for the teacher. As PZ commented: "*I think having it set up for the whole school would be very onerous on the teacher*" (Post interview, November 2014). PA had also given some thought to this: "*But then I wondered how, if all the kids had diaries, how the teacher would do that ... administer these diaries every day to do pictures and videos, and, you know*" (21/11/14). PG also added to these thoughts: "*I think it might be a bit labour intensive for the teacher if the whole*

class had it. You know what I mean, like, what would they be teaching if every five minutes they had to take photographs" (Post interview, November 2014).

Several teachers expressed a similar concern, as TG shared: "*Yeah, definitely, yeah, because that was one thing I was concerned about, like, if I had to do this 22 times, there's just no way*" (Post interview, November 2014). TI also felt the DD could be time consuming; however, had given some thought to how this might be managed:

> *Obviously, I think if you were doing it en masse it might get quite time consuming but I guess if you did, like with the checklist and you did three people a week, or four people, and so that you touched every family, then it would be awesome* (Post interview, November 2014).

Multiple communication methods: It was clear before the trial, that teachers and parents were using a variety of communication methods, including PDs, email, reading journals, telephone calls, as well as face-to-face contact. As PY shared: "*I think that it's, I suppose, a little bit confusing at the moment because different methods are used*" (Pre-interview, September 2014). While the DDI was taking place, most of the parents and teachers continued to use these other forms of communication alongside the DDs. Having so many different communication methods actively being used became confusing for some of the participants, and this was commented on by two parents (n=10) and two teachers (n=8). As PC explained:

> *There's the daily diary portion in the written diary, and then there's the reader folder, yeah, and then there's the Evernote and the e-mail, and then, you know, on Friday night, Monday night actually. And then there was, you know, end of year party for this and bring her this and, you know [Laughs] and if I miss, aahh. It took me two hours to get through it all on Monday night* (Post interview, November 2014).

This was summarised by PY who stated: "*I suppose it was a bit disjointed, because we were using a bit of this, a bit of that, you know*" (Post interview, November 2014). PC also discussed this idea: "*so there seems to be lots of places you have to fill stuff in. It would be nice if it was all contained*" (Post interview, November 2014).

While it wouldn't have been practical to ask teachers and parents to only use the DD during the innovation period and cease using all other forms of communication, enforcing this may have yielded different results. It therefore may be useful to examine other means of communication used between participants in further studies. PD explained that if Evernote was chosen as the main communication method, then it would encourage greater success: "*if there was going to be policy, where, you're not using e-mails, the communication has got to be through Evernote, then of course it would work*" (Post interview, November 2014).

Sensitive content: Seven parents (n=10) and one teacher (n=1) felt a separate channel was needed for parents and teachers to hold private conversations that the children did not have access to. As PZ explained: "*if she's going to be reading it and there's things going backwards between the teacher and home, then it's not necessarily all things that she would … that you would necessarily want her to read*" (Post interview, November 2014).   The private channel was felt to be particularly important because the children had AN. As PH shared:

> *from the perspective of her having learning difficulties, I probably would communicate directly with the teacher rather than in an open book, so to speak. Because I don't want CH to read it. I don't want her friends to get their hands on it should the diary get passed around, or a paper diary get passed* around (Post interview, November 2014).

Therefore, an extra channel was suggested as being a possible solution, as PK explained:

I think it might be a good idea to have two streams of information sharing, so one that CK has access to that's general, and one maybe where we can talk about things that obviously, we don't necessarily need CK to read or to have any input in (Post interview, December 2014).

Shared vision: Although they were in favour of using the DD, there were four parents (n=10) and one teacher (n=8) who didn't engage fully in the DDI. One of the main reasons was because the participants were already using a communication method they were happy with and didn't feel the DD offered anything additional to what they already had. As PJ explained:

It turned out to be a communication protocol, and I already have one; I have two in fact. I come up to the school every day and I know all of the teachers by sight if not by name, I speak to most of them on a regular basis, and there is an email; they send me an email, I send them an email, and I find emails are good because I can get CJ into bed at 9 o'clock at night … I can then go and spend a couple of hours just sorting out some paperwork, getting things ready for the next day, so I find sending an email at that time of night very good (Post interview, November 2014).

Another parent had similar thoughts: "*if I've got any special issues I would tend to write an email, which is what the Evernote can do anyway*" (Post interview, November 2014).

One parent explained whenever something new is introduced, it can take some time to bring everybody on board and prove to them that this is the most efficient and effective way of operating. As PJ explained:

It's a little bit like doing electronic banking. Before you do it, you just rock up at

the counter because that's what you used to do, and they talk you into trying a new thing, 'no, I don't want to do that'. And this lady, she's about my age, she says: 'Look, I do it and I would never go back from what I do'. And I said to her: 'Oh, that's because you're an employee of the bank. You want us to go and service ourselves and not even come in here'. She said: 'Look, if you do it, you won't look back'. And she said, 'you run a business and for business purposes this is absolutely what you want to do'. So anyway, I tried it, and she's right; she is 110% right (Post interview, November 2014).

Notifications: During the DDI, four parents (n=10) found it frustrating having to manually check if they had been sent a message, and preferred the notification feature on programs such as email and Facebook, that would pop up to inform them that a new message had arrived. As PK explained:

For me to use it, I think that I would want to have some sort of notification, or some sort of way of knowing that there's something waiting for me on mail or a little 1, or a little, you know, 'You've got mail', or something like that (Post interview, November 2014).

This idea was reiterated by PC:

So that you can look online to find out when their lessons are, but it would be fun to have a notification; you don't have to actually go and look for it, yeah … Or, 'Your lesson for this week is on Tuesday at 2.40' (Post interview, November 2014).

Technical challenges: From conducting the pre-innovation questionnaires, it was found the teachers and parents had varying levels of confidence and application of technology, which impacted upon how much the participants embraced Evernote as a communication tool. As one teacher shared:

I think, you know, for that first session with you I was probably thinking, oh gosh, because I'm not … I'm of the … I'm not like the girls where they just don't have that fear associated with, you know, tapping on a new button and what if this goes wrong (TD, Post interview, November 2014).

During the DDI, six parents (n=10) and two teachers (n=2) experienced issues with using the technology and/or software. There was a clear relationship between the participants' confidence in using technology and the level in which they participated in the DDI. For those participants who had regular access to mobile technology and used it in their personal, as well as professional life, they were found to initiate new notes to their teacher or parent counterpart, as well as being keen to try out the different modes to support the communication process. The less confident users, with limited access to mobile technology, mostly responded with basic notes to their teacher/parent counterpart, as PA explained: "*Unless someone sends me something I tend to not add to it*" (Post interview, November 2014). The less confident users also returned to their previous way of communicating quicker.

Prior to the DDI, none of the participants had used Evernote. Therefore, as expected, different issues were experienced with Evernote during the innovation period. As PK shared: "*I think we were all using different notebooks without realising*" (Post interview, November 2014). PZ also experienced problems with the technology during the innovation: "*I was having trouble with it on my phone. It kept freezing and I had to … remember I said I deleted it and then re-downloaded it*" (Post interview, November 2014). PG took several weeks before getting the application downloaded successfully on her phone, which impeded her ability to take part fully in the innovation as she had limited access to the information: "*Yeah, I had a bit of trouble getting it on my phone … I got it on my phone eventually, I think it was something to do with an update, but it took a while*" (Post interview, November 2014). Some of the participants tried to use video as part of the communication process but with limited

success: "*we looked at hers together when we were here, just to show her how to use it or … yeah, we tried really hard with that video, yeah, but we weren't very successful*" (TJ, Post interview, November 2014).

Analyses of the data showed the more confident users of technology did their best to overcome these problems; however, the less confident users were more likely to give up using the technology, as shared by PB: "*And then it would annoy me, so I'd put it down and then didn't pick it up again*" (Post interview, November 2014). This was also experienced by PH: "*if I had a glitch of any kind then that's just me, I found it really hard to work past it … if I can't touch just a couple of buttons and correct it then it becomes too complicated*" (Post interview, November 2014). When issues occurred, the participants went back to their previous way of communicating, as explained by PK:

> *We've been trying to find the easiest path of communication, easiest path of getting information to whoever we needed to get it to, so that has ended up being the one form of communication that had worked well until we started the trial, and obviously when everything went pear shaped we went back to what was familiar … what we knew to be reliable* (Post interview, November 2014).

In addition to the lack of knowledge, two teachers had issues with the actual technology (n=8), which lead to frustrations, as TG shared:

> *We had difficulty with IT because the iPad ran out of charge and we weren't given a charger, and nobody had one, nobody could find one, and it was a debacle, so we haven't used the iPad in the last three weeks … And I'm very cranky with the IT Department about that because we were enjoying it. You know, we didn't do one every day but it was a lovely process and I would have loved to have explored the movie option, the video option, but we just weren't*

able to (Post interview, November 2014).

Another teacher found it difficult using the DD for communication when the main device that it was being accessed on was often not charged, as TD shared, "*sometimes they came back to me uncharged, and then that was another job where I needed to charge it up, and it took time to charge it up*" (Post interview, November 2014). Having the DD accessible online meant any device could be used to access the diary but unfortunately this wasn't done in this case.

Also evident in the data was the need for schools wishing to use a DD to have a deliberate framework for its introduction and use. Furthermore, while Evernote served as an effective DD, there were additional features which would increase the application's functionality. Both these points will be discussed in the next chapter.

Conclusion

This chapter discussed the findings from the study, grouped into key themes that emerged from the data. The first part shared what parents and teachers wanted from home-school communication. Following this, a comparison was made between the PD and DD as a communication tool in meeting the requirements of the parents and teachers. This chapter concluded by sharing the parents' and teachers' perceived and actual challenges of implementing a DD to support home-school communication for primary aged children with AN.
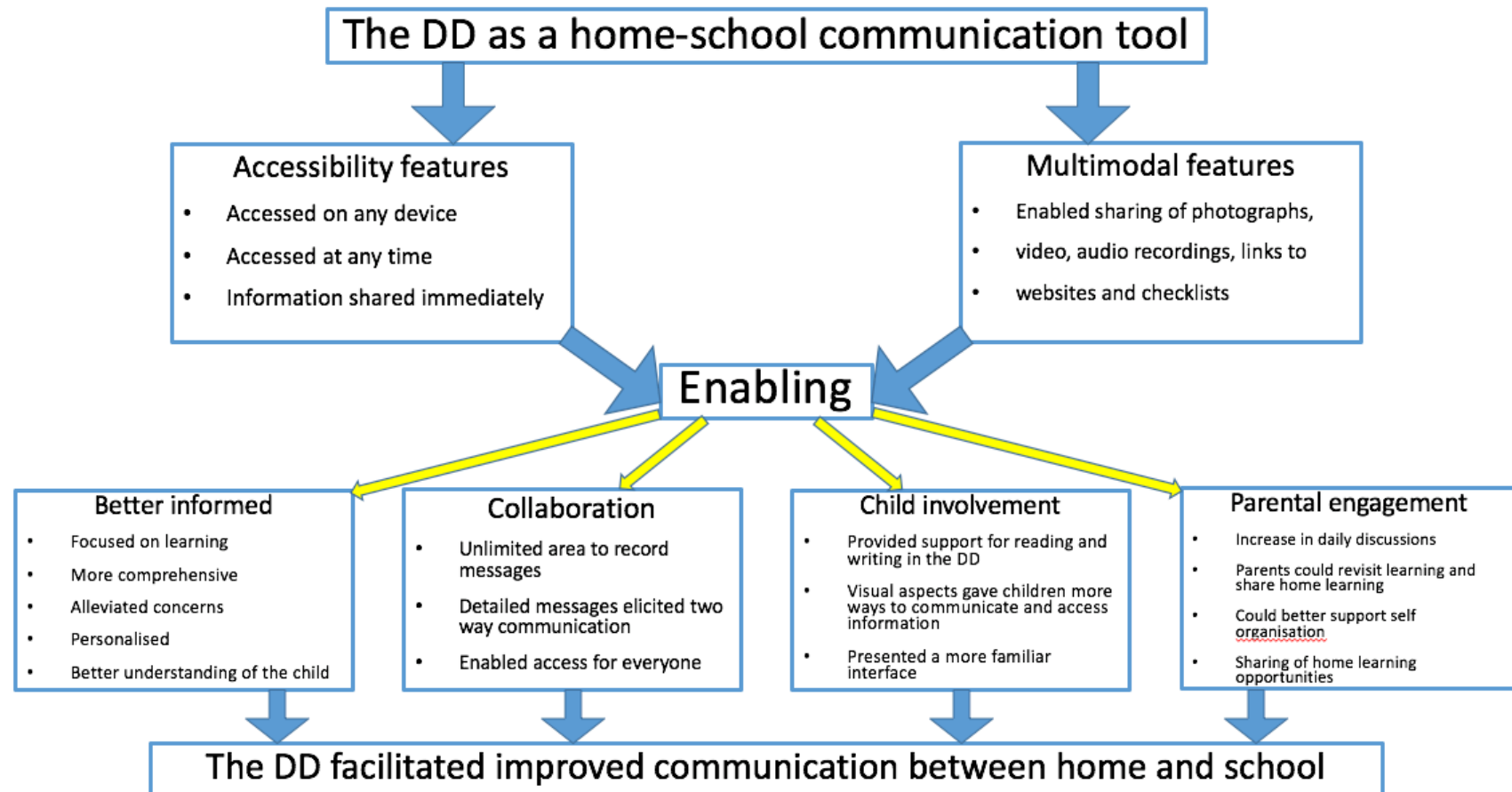
Figure 4.34: Summary of the key findings

CHAPTER FIVE: DISCUSSION

Research shows an effective communication system is vital to support children in achieving their best outcomes (Desforges & Abouchaar, 2003; Epstein, 1995; Melhuish et al., 2008). However, effective home-school communication remains an ongoing challenge for many schools (Cucchiara & Horvat, 2009; Elbaum, 2014; Horvat, Curci, & Partlow, 2010). This can prove more challenging for children with AN, as children with AN have a range of needs that need to be addressed if the child is going to experience a successful education (Busch, 2001). Parents of children with AN play an essential role in their child's education (Piškur et al., 2016), and often have many practical strategies being used successfully at home that need to be shared with the school and implemented into the classroom.

The establishment of an effective home-school communication system is crucial for facilitating collaboration between key professionals and parents, and facilitating parental engagement in a child's learning at home. Successful communication enables teachers to share positive aspects from the child's day, discuss any challenges which have arisen and provide ways in which the parent can further engage in their child's learning at home. In return, strategies can be shared to ensure consistency between home and school, and parents can inform teachers of outside interests, which then enables the teacher to tailor the child's working environment and curriculum to the child's needs. As different challenges arise, this information can be shared and a solution found more readily if an effective home-school communication system is in place and a successful working relationship has been established. Additionally, as the child experiences success, this too can be shared and celebrated by everyone involved in the development of the child.

Kosaretskii and Cherynyshova (2013) debate how more conventional forms of communicating are not working effectively; therefore, new ways need to be explored that will facilitate an effective home-school communication system. Research

conducted into the use of ICT to support communication between home and school has showed positive gains for teachers, parents and children (Department for Education and Skills, 2003; Grant, 2011; Kervin, 2005; Lewin & Luckin, 2010; Olmstead, 2013). Researchers argue how ICT presents many additional features to enhance the communication process (Bouffard, 2008; Grant, 2011; Kervin, 2005; Kosaretskii & Chernyshova, 2013; Olmstead, 2013; Shuler, 2009).

The purpose of this study was to find out how a digital diary (DD) compared to a paper diary (PD) in facilitating effective communication for parents and teachers of primary aged children with an AN. Using qualitative case studies, data was collected from pre-and post innovation interviews with parents and teachers, pre-innovation questionnaires, as well as paper and digital diaries. All data was collected from an independent primary school in the western suburbs of Perth, over a period of eight weeks. In this chapter, the key findings will be discussed, using the data collected. Following this, links will be made to the literature, and comparisons and contrasts made.

Key Finding One

What do parents and teachers of primary aged children with an additional need seek from home-school communication?

The first research question aimed to find out what parents and teachers of children with AN wanted from home-school communication. From the data, three key themes emerged as *being informed*, *collaboration* and *parental engagement*.

Being informed

Parents *being informed* regularly on their child's academic and emotional development was identified as a key requirement of home-school communication.

Although at the study school, parents saw their child's teacher more regularly than children with AN in other schooling situations, they still experienced anxiety about their child's happiness at school, their child's learning and interaction with peers. The feelings experienced by the study parents were consistent with current research (Burrows, 2004; Taub, 2006; Whitaker, 2007). These feelings were not alleviated using the PD, as during the pre-innovation interviews, parents discussed their frustrations at learning so little about their child's day. This was often due to the child not remembering events from the day, or not having the ability to share these events aurally. Similar findings were found in research conducted by Delaherche et al (2013), who found that children with AN often did not have the recall or aural skills to inform their parents adequately. Additionally, the PD communication system relied on the child remembering to take the PD to and from school. In the pre-innovation interviews, many parents expressed their frustrations with the child forgetting or losing the PD, which lead to a breakdown of communication between home and school. Research shows this is a common problem with using PDs for communication (Burrows, 2004, Cameron & Lee, 1997).

Additionally, a small group of parents and teachers expressed the need for the information to be shared in a timely manner to ensure its relevance. In the pre-innovation interviews, many parents expressed their frustrations with the child forgetting or losing the PD, which lead to delayed communication between home and school. Additionally, the PD offered limited access, as it was only available to the user when the child was in the same location. These restrictions often meant tardy communication, as by the time the PD reached the intended participant, the information was out of date. Research shows this to be a common problem with using PDs for communication (Amie, 2014; Burrows, 2004; Cameron & Lee, 1997) and stresses that for home-school communication to be effective, it needs to be read and responded to in a timely manner (Amie, 2014).

In the pre-interviews, several parents expressed frustration when key information had not been passed from one teacher to another, or one school to another, and identified the need for a better system to record and share information so that parents did not feel they had to build up a relationship from the beginning with their new teacher. Research identifies children transitioning between teachers or schools as a highly stressful time for parents (Parsons et al., 2009) and further research highlights the need for an effective system when handing over information at transition time (Fowler et al., 1991; Janus et al., 2008; Parsons et al., 2009).

Collaboration

During the pre-interviews, both parents and teachers expressed the need to work *collaboratively* to ensure the best outcomes for children. Additionally, parents and teachers discussed the necessity of two-way communication, where parents and teachers shared an equal relationship. However, analysis of the PDs found much of the communication was one way, with schools sending home small snippets of information about the child but getting little in response. Research has identified this as a common problem (Hughes & Greenhough, 2006), and shows the importance of parents and teachers working together using shared skills and experiences to fully benefit the child (Johnsen & Bele, 2012; Soto-Chodiman et al., 2012).

In addition to information being shared between parents and teachers, it was felt that shared communication with specialist teachers and other external professionals was important to enable consistency and a combined knowledge. As the PD only travelled between the class teacher and parents, other professionals were excluded from the communication process. Email was mostly used to collaborate with specialists and other professionals outside of school; however, the information shared excluded other key professionals involved in the child's education. This is consistent with the research that shows information is not being shared enough amongst professionals within an educational context (Janus et al., 2008).

Parental engagement

Although a key purpose of being informed was to support anxious parents, participants also discussed how being informed enabled *parents to engage in their child's learning* at home. In the pre-innovation interviews, parents showed a willingness to be involved in their child's education; however, a common difficulty was that they did not know how to support their child effectively at home. Research shows the importance of parental engagement at home in supporting improved learning outcomes for children. Key ways in which parents can engage in their child's learning are having discussions about the school day (Emerson et al., 2012; Zhang et al., 2011), revisiting learning from the school day (Cameron & Lee, 1997), supporting the child with self-organisation (Beveridge, 2007) and making connections between home and school learning (Emerson et al., 2012). Although some parents received termly overviews, along with targets set for the children, parents wanted more information on their child's day to day learning to facilitate ongoing conversations at home and practice new concepts. However, the study children were not able to share this information succinctly at home which, as previously highlighted, is a challenge faced by many schools. This has resulted in parents relying on home-school communication methods to receive this information and as PDs are frequently lost or forgotten, Zhang (2011) believes more research is needed to find ways that will support children when talking about their school day.

Having encountered many challenges with communicating via a PD, many of the participants in the innovation had already started to explore other more reliable forms of communication, such as email. Most parents and teachers responded positively to the digital diary innovation (DDI) and believed, with support and time, the DD could become a successful tool for home-school communication. These thoughts are consistent with findings by Amie (2014), Kosaretskii and Chernyshova (2013), who following their analysis of different communication methods, had identified many issues with communication via a PD and believed schools needed to

explore other ways to communicate in order to achieve a successful home-school communication system.

Key Finding Two

How did the digital diary compare with the paper diary in enabling effective home-school communication?

The second research question aimed to find out how the DD compared with the PD in achieving more effective home-school communication. From the data, it was clear that the DD had key features that showed to facilitate improved communication during the DDI. This is consistent with previous studies, which showed technology could provide benefits for the communication process (Department for Education and Skills, 2003; Grant, 2011; Kervin, 2005; Lewin & Luckin, 2010; Olmstead, 2013). Research suggests the use of technology for communication can be beneficial due to the additional features offered on a technological device (Bouffard, 2008; Grant, 2011; Kervin, 2005; Olmstead, 2013). During this study, the key features identified as having a positive impact on the home-school communication were the accessibility and multimodal features. The accessibility features enabled the participants to have constant access to the diary, on their preferred device, with built in support with reading and writing. The multimodal features enabled participants to use a variety of modes to send and receive the information. Analysis of the data showed the digital diary improved the communication in the three themes identified in the pre-innovation interviews; *being informed*, *collaboration* and *parental engagement*, as well as a new theme that emerged during the post innovation data collection. This was *child involvement*. This section discusses how the DD compared to the PD in facilitating home-school communication in these four themes.

Being informed

An effective communication system that enables regular and comprehensive sharing of the child's learning journey at school is essential to help alleviate parental concerns, and to ensure parents are kept up to date with their child's progress. As previously discussed, parents of children with AN have many worries, including if the child is accessing a meaningful curriculum (Whitaker, 2007), if their child is interacting with their peers (Taub, 2006) or if their child is happy (Burrows 2004). Analysis of the data showed that the DD enabled parents and teachers to be *more informed* of the child's development than had been possible through the PD. The PDs showed erratic and brief reporting on the day to day outcomes of the child, which did little to reassure parents. However, the DD proved more effective in alleviating concerns for parents, as diary entries were more regular, personalised and often included photographs to provide more visual feedback. Photographs were noted as a particular strength in the DD as it was felt these were far more effective in demonstrating that children were happy, experiencing success in their work and socialising with peers effectively.

The multimodal features of the DD enabled more comprehensive sharing of information and furthermore, the accessibility features of the DD presented a more accessible communication system to all participants. The PD offered limited access to the communication, as it was only available to the user when the child was in the same location. However, as the DD was hosted online, anyone with privileges could access the communication at a time and place convenient to them and on any device. During the post innovation interviews, participants commented on the advantages of being able to send and receive the information instantly, which enabled a more effective sharing system, as participants did not need to wait until receiving the diary before being able to access and respond to the information. These features enabled communication to be shared in a timely manner amongst the participants and encouraged more active participation from many parents, teachers and children than

the PD. The instant feature of a digital device was also noted as a huge benefit in research conducted by Kervin (2005) and Olmstead (2013).

Collaboration

Analysis of the PD entries found basic administrational, sporadic and brief comments about progress, which presented limited opportunities for parents to contribute to the communication or engage in their child's learning. Consequently, there were few examples of two-way communication. These findings are consistent with research that shows most communication between home and school is one way, where schools send information home without the expectation of anything being returned (Bull et al., 2008; Harris & Goodall, 2008; Marsh, 2003). However, research shows the importance of parents being active members in the communication process (Johnsen & Bele, 2012; Soto-Chodiman, Pooley, Cohen, & Taylor, 2012) and this is clearly illustrated through Epstein's Spheres of Influence (1995). During the DDI, entries sent home from school were more comprehensive, through the multiples modes used. Several teachers also used the multimodal features of the DD to encourage more communication back from home. As a result, several parents started to share information from home for the first time and greater *collaboration* occurred during the DDI. The DD entries included information about the child's out of school experiences, with photos for the teacher to look at. This type of sharing had not been possible using the PDs and teachers talked about their potential use in enabling teachers to create more personalised learning based around the child's interests. The benefits of home sharing was shown in research conducted by Cameron and Lee (1997), who demonstrated how the use of information shared from outside of school activities could help teachers to create more activities based around the child's own interests, which could greatly help to motivate the child.

During the post innovation interviews, several parents discussed how they felt more involved in their child's learning and enjoyed having opportunities to engage in two-way communication with the teacher. Research clearly shows many benefits to

parental involvement in home-school communication. Parents of children with AN play an essential role in their child's education as they have a deeper knowledge of their child's challenges, and often have tried and tested strategies to support their child that can be implemented into the classroom (Piškur et al., 2016). Johnsen & Bele (2012) add that two-way communication is particularly important in enabling parents to fully support their child's learning. The DD showed to present a new way of involving parents in the communication, which supports the idea by Olmstead (2013) and Kervin (2005), who claim that ICT offers a new way for parents to become involved in the communication process for those who have not been involved previously.

During the pre-interviews, several parents and teachers commented on the isolated ways in which teachers operated from specialist teachers within the school. The PD added to the isolation because normal practice was for the child to hand their PD to the teacher on their arrival to school and pick it up on their way out. This meant specialist teachers were not given access to the PD and class teachers were not party to communication between the specialist teachers and parents. The importance of involving all educators in the child's learning, as well as the class teacher as part of the collaboration was shown in research conducted by Ludicke and Kortman (2012) and Welchons and McIntyre (2015). Epstein's Spheres of Influence model (1995) also illustrates how parents, the school and the community need to work together to gain the most benefits for the child. During the DDI, several of the specialist teachers requested access to, and made comments in the DD, enabling all relevant educators to work more collaboratively with parents. The next step would have been to involve outside agencies in the communication, which would have been a simpler process using the DD. This idea was discussed by Emerson et al. (2012), who shared how powerful ICT based communication could be in enabling outside agencies to work with parents and teachers in achieving a shared outcome for the child.

Child Involvement

Few participants discussed the importance of child involvement in the communication process and prior to the DDI, many were using communication methods which excluded the child from the communication process. This included email, which the child did not have access to, and the PD, which many of the children could not read or readily contribute their ideas to. The limited communication in the PD from children was irregular and consisted of simple diary entries relating to reminders or homework. These were often single words that had been dictated to them by a teacher or a parent. However, research shows the involvement of children in the home-school communication process is beneficial to the child's development (Edwards & Alldred, 2000; Ludicke & Kortman, 2012) and as the child is at the centre of Epstein's Spheres of Influence (1995), it could be argued that children should also play an active role in the communication process. Although the involvement of children with AN in meaningful communication can be challenging, Edwards and Alldred (2000) argue that schools need to explore alternative ways to engage children in the communication process.

The DD provided an alternative tool for children with AN to communicate and facilitated more *child involvement* due to its accessibility and multimodal features. During the DDI, several children showed great enjoyment in contributing their own thoughts and experiences to the communication process. Using a tool that was already being used in other aspects of their life meant a familiar platform on which they could communicate. Photographs engaged the children and motivated them to share aspects of home and school with their teacher and parents respectively. The multimodal features also encouraged their own participation as children could use a range of modes to structure and illustrate their entries. This is consistent with research carried out by Hattie and Timperley (2007) who found that the use of multiple modes in sharing information had a large impact on the child and their understanding. In addition, the accessibility features enabled the child to type their entries quickly and accurately, because of the inbuilt typing support. Worthy of note

is that the children who joined in the communication process in the DD had been encouraged and supported by either their teacher or parent and this support is highlighted as essential by Grant (2011) to enable successful inclusion of children in the communication process.

Parental engagement

During the pre-interviews, several parents commented that their child was not able to give a recount of the school day. This was either because they did not have the recall skills needed to remember the key events of the day or the language skills to be able to recount these key events to their parents when they arrived home. This meant parents relying on written communication methods to learn about what happened during the day as a base for home discussions. However, the PD consisted of diary entries full of signatures, reminders and the occasional simple sentences about learning, which provided limited information about the child's day. Research shows the parents' engagement in their child's learning can make a significant difference to the child's learning outcomes (Harris & Goodall, 2008; Melbuish et.at., 2008 & Zhang, 2011). Therefore, Zhang (2011) believes more research should be done to find effective strategies to enable parents to engage with their child's learning at home. Analysis of the data identified four key practices in which parents engaged more effectively with their child's learning during the DDI. These were *daily discussions*, *revisiting learning*, *self-organisation* and *parents creating learning opportunities*.

In many of the DDs, more detailed sentences had been written explaining what the child had been learning. Additionally, many of these DD entries had used photographs to illustrate their child's learning from the day. These provided the basis for *daily discussions* between parents and the child. Several of the parents commented on being able to discuss the child's day for the first time, because of using the more in-depth diary entries and pictures, which research shows is an essential aspect of parental engagement and helps to improve student outcomes ((Australian

Research Alliance for Children & Youth, 2012; Cianca & Wischnowski, 2012; Zhang et al., 2011). The effectiveness of multiple modes to support communication was also found in a study carried out by Hughes and Greenhough (2006), where one parent commented that the multimodal way of sharing: "Opened up the world of school to us" (p. 476).

In the DDI, many parents expressed a desire to support their child at home and *revisit learning.* In his research, Curtiss et al. (2016) discusses the benefits of repeating strategies used at school at home; however, in many cases, the PD provided limited ways in which teachers could request support from parents. Additionally, very little information was provided about the child's learning at school for parents to follow up. This support provided by parents is one of the key ways in which parental engagement can make a difference to a child's progress, as shown by research (Cameron & Lee, 1997). The accessibility and multimodal features of the DD enabled teachers to share more comprehensive and personalised information about the child's learning. Additionally, several teachers shared interactive challenges for children to complete with their parents at home. This detailed sharing enabled parents to understand better what their child had been learning and how they could provide further support for their child at home.

For children with AN, *self-organisation* can be a difficult and frustrating skill to teach and for children to learn. During the pre-innovation interviews, several participants supported this view. Research indicates that parents can make a difference to their child's learning if they support them with their time management (Beveridge, 2007). The PD did not show to help children with their organisation for reasons that it was not used, was too complex to understand and the child had difficulties with their reading and writing. However, the checklist feature of the DD provided a way for parents and teachers to help break down bigger tasks into smaller and more manageable chunks for the child. Parents and teachers commented on their use of the checklists to help the child understand what they needed to do and in

several cases, they were responded to positively by the children and felt to have helped the child better understand the task and the steps needed to be successful.

As the study school was situated in an affluent area, it was clear that many of these parents had already been providing *learning opportunities outside of school*; however, this knowledge was not made available to the teacher unless an informal conversation occurred. No evidence of outside learning opportunities was found in the PD. However, in the DD, several parents recorded what their child had been learning outside of school, through expanded text and photographs. Some of the learning included parents creating activities for the child to help with aspects the child had found challenging at school. Other areas of learning included children doing extra holiday activities based around an interest they had discovered at school. Although these activities may have still happened when the PD was being used for communication, through the DD, the child was able to see that home learning was valued, as well as school learning, and the out of school learning shared would help the child to make connections between home and school learning. Additionally, teachers could see what the child had been doing and use this to facilitate discussions at school, as well as using it to base future projects around. This shared practice is another aspect of parental engagement which helps to improve student outcomes, as discussed by Emerson et al. (2012).

Overall, the DD, through its accessibility and multimodal features, showed to greatly improve home-school communication and offer a new and more effective way of communicating. The four themes the DD impacted on the most were *being informed*, *collaboration*, *child involvement* and *parental engagement*. At the end of the trial, there was a huge preference for communicating via electronic means. Although some participants admitted to still preferring email over the DD, they felt with more time and support, the DD could become the key communication tool that would support more effective home-school communication. These thoughts were in line with Shuler's findings that "Mobile technologies have the power to promote and

foster collaboration and communication, which are deemed essential for 21st-century success" (2009, p. 5).

Key Finding Three

The accessibility and multimodal features of the digital diary showed the potential to improve collaboration and parental engagement further

The DDI showed how the accessibility and multimodal features could improve home-school communication; however, the features used by the parents, teachers and children were mostly at a basic level, due to the limited timeframe of the innovation. If a personalised DD application was created in response to the feedback given from parents and teachers in the DDI, extra features could be included that could transform the communication process further. Extra features could enable better accessibility for users, as well as enabling more effective collaboration and parental engagement.

Accessibility for all users

The DDI showed how the DD enabled the children to be more involved in the communication because of being able to access the different modes and receive support with adding their own thoughts. Although all the parents involved in the DDI had good English skills and did not have any disabilities, such as being hard of hearing, the DD could also serve to support these difficulties and enable people with English as a second language and people with specific disabilities to be fully involved in the communication process as research shows parents with poor literacy skills or from a non-English speaking background often experience difficulties with reading handwritten communication sent home (Hansuvadha, 2009; Harris & Goodall, 2008). If the information was sent home by audio recordings or by video, the information would already be accessible to users with a low reading ability. However, if it was

typed, the text could be translated into the required language for individual families of non or low-English speaking background. For diary users who had challenges with their sight, the text could be enlarged for easier reading and for users who had a lower reading ability, an option could be provided to have text read aloud. These extra accessibility options could exist on a DD platform; however, would not be possible with a PD.

Further collaboration

In the DDI, specialist teachers began communicating via the DD; however, outside agencies did not become involved*.* Epstein's Three Spheres of Influence (1995) shows how the biggest impact on the child's learning is when the parents, teachers and community work collaboratively and Emerson et al. (2012) suggest how ICT based communication could enable outside agencies to collaborate with the teacher and parent. Although this did not happen during the DDI, it is clear that using the DD for communication would facilitate efficient sharing with outside agencies, thereby enabling more effective collaboration between parents, teachers and the community.

Using home interests

As discussed, in the PD, no outside school activities were shared with teachers. However, in the DD, several parents shared activities the child had been doing outside of school. These included winning a medal for sport, taking part in swimming, and having free play with friends in a tepee. In each case, the parents had uploaded pictures to illustrate their explanation, which provided a much more comprehensive description that teachers could see as they opened the DD. Learning about the child's home interests enables teachers to use this as a base for future learning which has been shown to be beneficial as it increases student motivation. This is consistent with research (Cameron & Lee, 1997; Grant, 2011). Many children with AN lack motivation as they struggle more with school work and feel themselves achieving a lower level

than their peers; therefore, providing activities based around the child's interests would provide much needed motivation to support these children.

Children taking responsibility

It was felt the children became more involved in their learning as they played a bigger role in the communication process. Several participants discussed the possibility of the child taking more responsibility for the communication by using the DD as a tool to reflect on their day and share positive experiences. The multimodal features, such as photographs and video could then be used to illustrate their thoughts. A PD would prove to be ineffective for this purpose as many children would have difficulty with its access; however, the DD would provide effective features to enable this to happen. If children were formally invited to the communication process, support would need to be provided to ensure the child was able to use the technology effectively, as well as receiving help in how to add their own voice (Grant, 2011).

Digital portfolio

The PD presented a communication tool with boxes for parents and teachers to write in. However, if the teacher or parents wanted to add more information, they had the option of writing across several days or attaching the information to the PD. This meant many parents needed to look at several things when the child arrived home. However, the DD allowed for the centralisation of all communication, as text boxes expanded as required, and additional information could be digitally attached to the diary. Bouffard (2008) suggests ICT offers an efficient way to store data relating to the child's achievements or other important documents. Several teachers suggested that the DD could also be used as a learning portfolio, which would save time for the teacher at the end of the year. A suggestion made by one of the teachers, was that if work was regularly updated, this work could be turned into a learning journey for a designated subject. Tagging an entry with the name of the subject would enable all the work under that title to be brought up quickly. Software already exists where the

user can tag an item with a star, and in this case, a star could be added to a piece of work intended for the child's portfolio. The user would just need to type in the subject and star for a learning journey of a particular subject's work to be displayed visually on the computer.

Feedback

Feedback became more effective in the DD, through the use of the accessibility and multimodal features. If schools were to choose a DD for communication purposes, it would provide teachers with a variety of ways in which feedback could be given to the parent and child. There would be opportunities to attach documents electronically to the DD with typed comments, for feedback to be given via an online private space, which could be accessed via the DD. Feedback could also be presented via a recorded video by the teacher, which would then be attached to the DD. This feedback method was found to have a powerful impact in one research project (Hattie & Timperley, 2007). These options would enable greater access for children with AN as feedback could be provided in multiple forms, rather than just handwriting.

Further engagement

In many cases, parents of children with AN do not know how to support their child's learning at home and to facilitate effective parental engagement. Amie (2014) and Lewin and Luckin (2010) argue that schools should provide support to parents on how to engage in their child's learning. The PD did not allow any additional information to be shared very easily and providing extra support in this form would be limited. However, through the multimodal features of the DD, the different modes could be used to provide support in a variety of ways. There was already a shift in how teachers encouraged support from parents from the PD to the DD. The PD provided very little guidance on how parents could support their child at home; however, several teachers used the DD to encourage parental engagement. This was achieved through longer text, explaining what the child had done at school in depth.

It was also done through teachers asking children to take photographs to show different elements of learning. It was anticipated these photographs would be taken with their parents, therefore involving their parents in the process. In further use of the DD, the video could be an effective feature to provide support. Strategies used by teachers could be recorded and uploaded to the DD for parents to repeat at home (Curtiss et al., 2016). Video could also be captured of a section of a lesson for parents to watch and discuss with their child at home. Additionally, children could record video of themselves reflecting on the day whilst at school, which could then be watched at home and discussed. Teachers could even begin a library of resources that could be linked to the DD for the parent to access at a convenient time. Furthermore, teachers could begin making connections with the children's out of school learning, which would enable more parental engagement (Australian Research Alliance for Children & Youth, 2012).

Key Finding Four

Implementation of the digital diary

From the analysis of the data, there are essential steps that need to be taken to ensure effective implementation of a digital communication system. These are *establishing a program, shared vision, training and support, access for relevant parties* and *guidelines*. These five steps will be discussed in the following section, with suggestions and ideas directly quoted from the participants of the DDI.

Establishing a program

Time and money would need to be invested in finding a DD that would fit in with what the school was trying to achieve regarding home-school communication, as well as a program that was user friendly, reliable and more effective than current systems. This point was stressed by PJ:

So I caution you that when people replace one protocol with another, they want to make sure that the protocol has been trialled, carefully thought out, and is as crack free as possible, particularly for people like myself who are easily put off such things (Post interview, November 2014).

As well as this, it would need to support all the other aspects of school communication, including the hosting of a school calendar and a reading log to ensure everything could be accessed via the DD. This point was supported by PK:

The thing with our physical diary at school is that it has a whole host of other information in it as well, so, I mean, I think you can get round that in terms of it not being necessarily a diary, but a little handbook that could be given at the beginning of the year and then they use Evernote as their diary … Yeah, so basically, it's got a whole pile of pertinent information for parents and students, as well as for the school (Post interview, November 2014).

The program chosen should have undergone some thorough testing from another school and/or a small trial group within the school to ensure it meets the schools' needs.

Shared vision

If a decision was made by the school's leadership team to adopt a DD communication system, adequate time and resources would need to be allocated to ensure the changeover from current methods to the new one was seamless and didn't impede on the home-school communication already taking place. The outcomes from the innovation suggest all communicators need to be committed to using the DD in order for the new method to be successful, as PY shared:

I suppose it really … because it's such a two-way thing, or three-way thing, how many teachers are involved, both parties have to be totally on board with it to

probably get the maximum out of it, so it depends on the outlook by people on whether they like it or not and whether they're going to use it (Post interview, November 2014).

Training and support

Prior to the start of the DDs being introduced, professional development would need to be provided to all users, including teachers, parents and the children. This would be a time to show the capabilities of the program to generate shared enthusiasm. PA shared, *"you know, if I knew more about it then … it's capacity, then I probably would use it a lot more"* (Post interview, November 2014). Parents and teachers would also need to take an active role in supporting the children. During the innovation, PJ believed their child was far more engaged in the DD because the teacher had taken time to support the child in its use:

CJ's primary enjoyment was just the fact that she had her teacher at the other end, you know, the fact that she was there, and I don't think she quite realised that when she was a few times with me sorting out emails and I'd send the email off, I think because this was her protocol and because her teacher had spoken to her about it and shown her at her end what she was doing, and encouraged CJ to use it, that it was a personal interaction between the two of them, and I think that that … if anything won the day I think that had quite a large part to play in getting CJ on board … Whereas if dad had just said, listen, you've been told to use this, you'd better use it, I don't think that would have quite had the same clout really (Post interview, November 2014),

Further training should then be given at regular intervals to help users build up their confidence and skills to use the program at its full potential. This should involve lots of hands on practice for people to explore the program:

I think with practice, if I was to … be a bit more confident with, you know, hopping on and doing the videoing, I think I would, I would probably improve. I mean, it's the same with anything, isn't it? (TD, Post interview, November 2014).

It was suggested by one parent that a school based service desk was set up to provide support in person and over the phone, "*if there was like an IT department that was able, you know, with some kind of permanent support then … I would have felt okay just to front up to their desk and say: 'I'm having a problem with this.'*" (PH, Post interview, November 2014).

During the initial stages of the DD implementation, there should be a period of adjustment when users are given time to move across to the new system. This would be important, as the new system of communicating would be very different to what people were used to, as TJ explained:

Well, it's actually a whole new way of thinking and communicating, so it would take a … it would take a bit to get used to because, you know, we're used to just a note in the diary or a date in the diary, and the emails separately (Post interview, December 2014).

Once the period of adjustment was over, the DD would be the expected way to communicate.

Access for relevant parties

During the DDI, only the parent, teacher and child had access to the diary, along with the researcher; however, if the DD was to be fully implemented, all teachers working with the child should be included in the DD, as they would have valuable contributions to make, as PY shared:

Well, I would … I reckon it would have actually been really good for the support teacher to be involved too, because she's taking CY out of the classroom for, like, 3 on 1, for like little group lessons, and sometimes you would like to hear about that as well (Post interview, November 2014).

Having the additional staff involved in the DD communication would also reduce any additional communication happening outside the DD.

Guidelines

When introducing the DD as a new system of communicating, it would be advisable to revisit the home-school communication protocols. Children should be actively encouraged to be part of the communication process as it has shown to benefit the child and their learning, as shared by PY: "*Well, it's all part of a learning journey isn't it, and I think perhaps if you included that, included them in that, then that could be a benefit*" (Post interview, November 2014).

It would be important to set guidelines around what should be contributed, to ensure the DD remained relevant and easy to navigate through. As PD explained: "*the downside of technology is you do get a lot of emails and lot of junk, you know, people get overloaded with information that they don't necessarily need to have*" (Post interview, November 2014). TI also discussed her concerns with being overloaded with information:

Well as a teacher, if you're looking through 20, you probably just want the parents' quick one line, 'CH's not feeling well', or 'CH hasn't slept or something like that', because you can't be watching five minute videos that every kid wants to show you of their animal or their parties (Post interview, November 2014).

This concern was also raised by TJ:

Yeah, I mean, you would do your best to make it manageable, wouldn't you? Or you'd set restrictions like you can only, you know, 'let's only share about certain things, like not just little messages like, hi, how are you going?', like, you know, you'd cut all those sorts of things out [Laughs]. I mean, you might let them initially do that to get used to the program and see it as something fun, but yeah, like, I don't know if you'd use it for, 'Oh, I'm not going to be at school today.' Absences and things like that, I think you'd cut all that out and just make it just for learning, so you'd have strict rules about that, so then it makes it more manageable (Post interview, December 2014).

A suggested design feature for a DD could explore the use of zones where those using the DD only use their own zones. For examples notes between parents and the child could be kept separate from notes between teachers, parents and children so only the relevant people would have access to them.

It would be important to establish what the purpose of the DD was. When speaking to one parent following the innovation, she was very focused on the grammar and punctuation of messages:

I mean, you've read many emails and there's some real glaring typos in them and you forgive them because you know how easy it is to do, but editing, re-editing, thinking about things, even if you just go and do the washing-up, and while you're doing the washing-up you're thinking about what you've actually communicated, and then things you've left out and the things perhaps you should leave out, because it's very easy to innocently offend people via, you know, simple communications (PJ, Post interview, November 2014).

If the DD only comprised of people's 'best writing', it would quickly lose its appeal as people would be discouraged from writing in it. It would need to be

stressed that the DD was a working document that captured learning and other comments on the go; therefore, the writing used in the DD would be largely informal.

The steps needed to ensure effective implementation of a digital communication system have been shared, from the viewpoints of the participants involved in the DDI. These were *establishing a program, shared vision, training and support, access for relevant parties* and *guidelines*. Each of these steps was carefully considered by several of the participants as necessary steps to ensure a smooth transition from paper based communication to a digital communication system.

Key Finding Five

Recommendations for digital diary software

From the analysis of the data, participants had clear ideas about what they felt was needed from digital diary software to facilitate an effective home-school communication system. These were categorised into eight features: *adding a new note, notifications, read receipts, broadcast messages, locked channels, front page, linking applications* and *user friendly*. These eight features will be discussed in the following section, with suggestions and ideas directly quoted from the participants of the DDI.

Adding a new note

One of the parents felt adding new entries was a bit challenging in Evernote as the 'Add note' button wasn't particularly clear and she found it difficult to add to a note already in progress. As she shared:

I mean, what I did find hard was the, sort of the thread of conversations' (PY, Post interview, November 2014). It was more the … so you do it in notes, and I was sort of labelling it like Tuesday, you know, a date, Tuesday the whatever,

and then of course when they replied to that, perhaps the next day, and I wasn't really sure about whether I should be starting … which would be a new note for every day, or whether … I know you can just continue in that conversation, but when to start up a new note and whether just to go in the same note (Post interview, November 2014).

It may be easier to have an image such as a '+' button to add a new note and once the note has been made and sent, then not allowing anybody to add to that note as this is what made it confusing for some of the users, as PA explained: "*And replying I think was another one. When you replied on the bottom of some … when you tried to reply on the bottom of someone else's message it wasn't clear, I thought*" (Post interview, November 2014).

Notifications

As previously highlighted, most parents and teachers agreed being notified when they were sent a new note was an essential aspect of an effective DD. During the innovation, participants found it frustrating having to manually check if they had been sent a message, and preferred the notification feature on programs such as email and Facebook that would pop up to inform them that a new message had arrived. As PK explained:

For me to use it, I think that I would want to have some sort of notification, or some sort of way of knowing that there's something waiting for me on mail or a little one, or a little, you know, 'You've got mail', or something like that (Post interview, November 2014).

This idea was reiterated by PC:

So that you can look online to find out when their lessons are, but it would be fun to have a notification; you don't have to actually go and look for it, yeah …

Or, 'Your lesson for this week is on Tuesday at 2.40' (Post interview, November 2014).

Read receipts

Some of the teachers and parents were reluctant to write a note on Evernote as they didn't know if their teacher/parent counterpart was reading it, as PK shared: "I think TK was probably reluctant to put it on Evernote in case I didn't see it" (Post interview, November 2014). PA shared the same worry:

Email is probably the most direct because I, you know, that gets sent, and I don't know how often he checks, so the teacher checks … So I know the email will be on his desktop and he'll see it … And I think that's the thing. If you don't know … you know people are using email every day, you don't know they're using this everyday (Post interview, November 2014).

To help with this issue, PA suggested having a feature built into the program that allowed the sender to be notified when the receiving person had read their message: "*It's hard to know who sees what or, you know, there's no response, I suppose, system, or read receipt or anything like that, so then, you know, maybe if that was added then you'd know*" (Post interview, November 2014). Having a read receipts feature built into the DD program could also encourage more of the participants to reply to messages, as they would know the other person had seen the message had been read and would be waiting for a response, as PA explained: "*It would probably keep you a bit more on track too, and I think it would prompt you to actually communicate a little bit more if you know that people are waiting to hear from you*" (Post interview, November 2014).

Broadcast messages

In some cases, teachers send the same message to all parents in the class, and rather than re-writing the same message 20 times, it would be far more efficient if the diary had the capacity to broadcast group messages, where the teacher would write a message and press on a button to indicate they would like that same message to be sent to all the members in their class. PY shared an idea similar to this when discussing the additional features she would like to see in a DD: "*Yeah, and say this is what we've done today and take a few photographs and send it as, as a whole thing rather than to each individual child. Things like that I think would work quite well*" (PY, Post interview, November 2014). TG liked this idea too: "*if you could send it out to the whole class, that would be cool*" (Post interview, November 2014).   Most of the messages broadcast to the whole class would be administrational based and would therefore leave more time for meaningful conversations based around the child's learning.

Locked channels

Many of the parents and teachers expressed anxiety about children accessing notes that were more sensitive and not intended for children to see them. This is one of the reasons email was still used so frequently during the innovation.   As PY explained:

> *If there's something that you're concerned about I wouldn't put that down, you know, because if I knew CY was accessing it I wouldn't want her to see anything negative. But on the other hand, if it is a tool where you're just talking about great work and, you know, what she's done during the day and that sort of thing, then it's good, because she can see that and be proud of what she's done. But I think maybe any real concerns between the teacher and the parents, that's probably … yeah, I wouldn't use it for that* (Post interview, November 2014).

PK discussed the idea of having two separate lines of communication; one that involved the child and one that didn't involve the child:

I think, I think it might be a good idea to have two streams of information sharing, so one that CK has access to that's general, and one maybe where we can talk about things that obviously we don't necessarily need CK to read or to have any input in (Post interview, November 2014).

To ensure the line of communication between the parent and teacher couldn't be accessed by the child, some of the participants suggested having a locked channel of communication that could only be accessed by the teacher and parent, as described by PC: "*if you had one note that was accessible for CC and the teacher and me, and then you could change the access to the notes so that if you had a teacher/parent, and … maybe permissions, or something*" (Post interview, November 2014).

Front page

It was suggested it might be easier to navigate around the DD if the front page looked similar to a desktop, with icons representing different areas of the diary that the user can click on to go to, as PA tried to explain: "*If you could set it up to be quite…you know, almost like a little desktop for kids, I think that would be great…Or desktop for school, so you know, home or, you know, activities*" (Post interview, November 2014). This desktop look could then have images with links to represent sections of the diary the users could go to, with sections such as 'Chat' to send messages, 'daily updates', to share daily learning with photographs, 'Calendar' to look at school events coming up and 'Reading log' to fill in the reading log children were required to do at home.

Linking applications

Having other programs linked to the DD would be extremely beneficial so that all the information the user needed was accessed through the DD. One of the teachers commented about having the school calendar linked to Evernote:

Yeah, so if it was set up like that, I would ... I would prefer to use that than the PD so that you can all see, like, the week or the month in front of you, and then you could add notes to each day, like each day you want to share something you do it on that day of the diary. I'm very visual, I like to see it like that [laughs] like the week in front of me and go: 'Oh, CJ did well in a test that day so I'm going to write a note that day', you know, and we've got this coming up, this ... can you see, we've got swimming coming up on Friday (TJ, Post interview, December 2014).

This feature was also mentioned by one of the parents.

User friendly

The software selected would need to be user friendly, particularly for those who lacked confidence with technology. Although ongoing support and guidance would be available with the introduction and ongoing use of a DD, consideration must be given to the fact that many parents and teachers will be using the software on their own and it would be essential for them to experience success with the software to ensure their ongoing use of the DD. Once their confidence had been established, there should be provision for them to use the software at a more complex level. To illustrate this, it could be that new users just start by sending messages, then as time goes on and their confidence develops, they can then begin to add other aspects to their messages, such as pictures and video. This idea was discussed in detail by PJ:

It would need to have layers of complexity. It would need to have a layer which is very simple, very straightforward, and would include very obvious pages, perhaps that you could flick through, the way these screens work I know you just flick across them, but you'd need to have, and I did say this to you earlier, needs to have the timetable, it needs to have homework, and it needs to have a communication of this is what I've been doing and this is how much time I've been spending on it; it needs to be simple … And then if you need to have a more formal communication, then you need these other things, as your app seems to have, which is the ability to attach things, perhaps type in a more complex message, and so on (Post interview, November 2014).

An overview has been provided as to the features participants felt were important to support an effective digital diary system. These were *adding a new note, notifications, read receipts, broadcast messages, locked channels, front page, linking applications* and *user friendly*.

CHAPTER SIX: CONCLUSION

Importance of the Study

Educating children with AN is challenging because it is dynamic. Within Australia, children with AN may attend a specialist school or a mainstream school, with extra support or in a separate class, depending on the State lived in, need of the child and views of the parents and professionals involved.

Essential to the education of children with AN is home-school communication. Literature shows collaboration between home, school and the wider community are crucial to the success of the child and effective parental engagement makes a significance difference to the child's learning outcomes. Although little research has been conducted on the impact of home-school communication on the outcomes of children with AN, the extensive amount of research conducted on mainstream children show effective home-school communication is critical to the success of the child.

The most common means of home-school communication discussed in the literature was a paper diary (PD). The PD exhibited many weaknesses and research shows how traditional methods are no longer working effectively in schools. While some researchers suggest ICT could provide a more effective solution for supporting home-school communication, in general this was noticeably absent in the literature.

Research Questions and Key Findings

The research questions for this study were:

1. What do parents and teachers of children with additional needs want from home-school communication?

2. How does home-school communication compare between the use of a paper diary and a digital diary for teachers and parents of primary aged children with an additional need?

To answer these questions, a digital diary (DD) was introduced into eight classrooms and trialled for a period of eight weeks. Ten parents and eight teachers made up 10 case studies, which were looked at in detail over the course of the innovation period to find out how the DD compared to the PD in enabling effective home-school communication. Teachers and parents were interviewed and surveyed prior to the trial and their perceptions compared using data from post innovation interviews. Additionally, PDs used before the DDI were analysed and compared to the DDs used during the trial. This was a qualitative study that used a multiple case study approach.

Two stand out characteristics of the DD, which enhanced home-school communication were readily identifiable as the DD's accessibility and multimodal features. The accessibility characteristics enabled more regular contributions from many of the participants and the multimodal features allowed more detailed communication. The combination of these two features enabled parents and teachers to be better informed, facilitated greater collaboration between the key persons in the child's life, including parents and teachers, encouraged greater child participation in the communication and showed to improve parental engagement in their child's learning at home.

Findings the researcher did not expect were firstly, how much the content changed from being administrational to learning based, through the use of the DD. Secondly, the significantly more personalised learning that was shared and finally, how much more the DD involved the child in the communication process than the PD.

Implications

Implications for the researcher

As a teacher and consultant working in special education, this study has provided the researcher with a greater understanding of the importance of home-school communication and the ways in which a DD can provide an alternative and more effective tool for schools. Based on experience, the researcher knew PDs to be losing relevance in special education and that the DD would make an impact, but not to the extent it did. Additionally, the enthusiasm for the DD displayed by some of the teachers, parents and children was also unexpected. The research carried out highlighted the key barriers to communication, showing why home-school communication was failing in many schools. Finally, the study enabled the researcher to better understand the way in which an effective home-school communication system can be introduced and implemented successfully.

Implications for schools

The implications of this study are that ICT clearly has features, which can significantly improve home-school communication; therefore, there is a strong case for schools replacing PDs with DDs. From the research conducted, there were challenges that would need considering should schools make the decision to explore the use of the DD for communication. The primary areas that would need consideration would be the software or application to use and the development of a shared approach with parents and teachers to enable shared enthusiasm for a change in methods. A final requirement would be the development of an on-going school-wide professional development plan that caters to the ranging abilities in ICT knowledge and application.

Limitations

Although the data collected from this study has shown benefits in using a DD instead of a PD to support home-school communication, the limitations of this research must be noted. The innovation period was short at just eight weeks. The number of participants was small, with a total of 18 participants taking part, making up 10 case studies. Additionally, the study took place in one independent school in Perth. And finally, the school and the participants were based in a high socio-economic area. These limitations demonstrate the data obtained from the study cannot be used to generalise across different contexts.

Recommendations for Further Study

Opportunities for further research in this field would be using a large sample size, across multiple schools. It would also be interesting to base a similar study at a specialist school/s where children travel greater distances to school, so parents are not seen as regularly as they were at the study school. Additionally, it would be beneficial to see the outcomes from a longer innovation period. And finally, valuable data would be from areas contrasting to the one in the study; therefore, focusing on low or medium socio-economic areas, or looking at schools in areas where English was primarily an additional language. For these studies, there would be a need to recognise that participants may not have any Internet or even ICT at home and so the innovation would need modifying to accommodate these differences.

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Appendices

Appendix A - Presentation Slides Used During the Information Session

Appendix B - Parent Questionnaire

Section A: Use of Technology

1. Do you own a phone that can connect to the internet?

    ☐ Yes   ☐ No

2. Do you have a computer or tablet at home?

    ☐ Computer   Number of computers: _____

    ☐ Tablet   Number of tablets: _____

3. Do you have access to the internet at home?

    ☐ Yes   ☐ No

4. How often do you use the internet each day on average? (Do not include work use).

    ☐ Less than an hour a day   ☐ 1-3 hours

    ☐ More than 3 hours

5. What do you regularly use technology for?

    ☐ Emailing   ☐ Social networking

    ☐ Online shopping   ☐ Word processing

    ☐ Entertainment   ☐ News and Education

    ☐ Other. Please state: _____

Section B: Communication between home and school

6. Do you think communication between home and school is important?

    ☐ Strongly agree   ☐ Agree

    ☐ Disagree   ☐ Strongly disagree   ☐ Unsure

7. Please indicate how often you communicate with school (on average).
    (Eg., 3 times a week, once a week, once a fortnight, etc.)

    _____

8. How often do you receive communication from the school (on average)?

    _____

9. Are you satisfied with the current level of communication between home and school?

☐ Yes

☐ No   If no, what would you like to change?   _____

10. How have you communicated with the school in the past?

☐ Face to face   ☐ Communication book / diary

☐ Telephone   ☐ Individual notes

☐ Email   ☐ Other – Please state:

_____

11. What is your preferred method of contacting the school?

_____

12. What is your preferred method of receiving communication from the school?

_____

Section C: Demographic Information

13. What is your postcode?

_____

14. What is your gender?

☐ Male   ☐ Female

15. What age bracket are you in?

☐ 20-29   ☐ 30-39   ☐ 40-49   ☐ 50 or over

16. What is your marital status?

☐ Single   ☐ Married / De-facto

☐ Separated / Divorced   ☐ Would rather not say

17. How many children under 16 live in your household?

☐ 1   ☐ 2   ☐ 3   ☐ 4 or more

18. What is your current occupation? _____

19. How many hours per week do you usually work at your main job? _____

Appendix C - Teacher Questionnaire

Section A: Use of Technology

1. Do you own a phone that can connect to the internet?
   ☐ Yes   ☐ No

2. Do you have a computer or tablet at home?
   ☐ Computer   Number of computers: _____
   ☐ Tablet   Number of tablets: _____

3. Do you have access to the internet at home?
   ☐ Yes   ☐ No

4. How often do you use the internet each day on average? (Do not include work use).
   ☐ Less than an hour a day   ☐ 1-3 hours
   ☐ More than 3 hours

5. What do you regularly use technology for?
   ☐ Emailing   ☐ Social networking
   ☐ Online shopping   ☐ Word processing
   ☐ Entertainment   ☐ News and Education
   ☐ Other. Please state: _____

Section B: Communication between home and school

6. Do you think communication between home and school is important?
   ☐ Strongly agree   ☐ Agree
   ☐ Disagree   ☐ Strongly disagree   ☐ Unsure

7. Please indicate how often you communicate with home (on average).
   (Eg., 3 times a week, once a week, once a fortnight, etc.)

   _____

8. How often do you receive communication from home (on average)?

   _____

9. Are you satisfied with the current level of communication between home and school?

☐ Yes

☐ No   If no, what would you like to change?

_____

_____

11. How have you communicated with home in the past?

☐ Face to face   ☐ Communication book / diary

☐ Telephone   ☐ Individual notes

☐ Email   ☐ Other – Please state:

_____

12. What is your preferred method of contacting home?

_____

13. What is your preferred method of receiving communication from home?

_____

Section C: Demographic Information

14. What is your gender?

☐ Male   ☐ Female

15. What age bracket are you in?

☐ 20-29   ☐ 30-39   ☐ 40-49   ☐ 50 or over

19. What is your teaching position? (Role within school, age group taught etc.)

_____

Appendix D - Pre-interview Questions for Parents

Date of interview: **Venue:**
Name of interviewee: **M / F**

a. Thank you for agreeing to be part of this research. Have you had a chance to look at the information sheet?

b. My name is Dawn Hallett.   I am a teacher and am currently studying a Masters at Edith Cowan University.

c.   Today we will spend about half an hour discussing issues around home-school communication. I would like to gain your thoughts and perspectives on this area.

d.   With your permission, I would like to record the interview for research purposes. Are you happy for me to do this?

Qu.1	**Describe a typical day at school for you.**
Qu.2	**Do you think communication between home and school is important?** *- Why do you think communication is important?* *- What other benefits could it have?* *- Do you think it has any impact on a child's learning? In what way?*
Qu.3	**What do you think of the communication systems currently set up at the school?** *- What do you like?* *- What do you dislike?* *- How does it compare with previous systems?* *- What does it do well?* *- What are its limitations?*
Qu.4	**What information is shared between school and home using this communication tool?** *- Is there anything else you'd like to share/receive information about?*
Qu.5	**Have you had any problems communicating with home?**
Qu.6	**What do you think of the idea of using technology to support communication?** *- What benefits could it have?* *- What problems may arise?*
Qu.7	**Is there anything else you'd like to share that you haven't already?**

Appendix E - Pre-interview Questions for Teachers

Date of interview: **Venue:**
Name of interviewee: **M / F**

a. Thank you for agreeing to be part of this research. Have you had a chance to look at the information sheet?

b. My name is Dawn Hallett.   I am a teacher and am currently studying a Masters at Edith Cowan University.

c.   Today we will spend about half an hour discussing issues around home-school communication. I would like to gain your thoughts and perspectives on this area.

d.   With your permission, I would like to record the interview for research purposes. Are you happy for me to do this?

Qu.1	**Describe a typical day at school for you.**
Qu.2	**Do you think communication between home and school is important?** *- Why do you think communication is important?* *- What other benefits could it have?* *- Do you think it has any impact on a child's learning? In what way?*
Qu.3	**What do you think of the communication systems currently set up at the school?** *- What do you like?* *- What do you dislike?* *- How does it compare with previous systems?* *- What does it do well?* *- What are its limitations?*
Qu.4	**What information is shared between school and home using this communication tool?** *- Is there anything else you'd like to share/receive information about?*
Qu.5	**Have you had any problems communicating with home?**
Qu.6	**What do you think of the idea of using technology to support communication?** *- What benefits could it have?* *- What problems may arise?*
Qu.7	**Is there anything else you'd like to share that you haven't already?**

Appendix F - Recording Rubric used to Collect Data from the Paper and Digital Diaries

Name:		Pre-innovation / Post- innovation

Week	Day	Who? (P-Parent, T-Teacher, C-Child U-Unknown)	Communication Type (HW-Handwritten, T-Typed, VR-Voice recorded, V-Videoed, I-Image uploaded, AN-Attached note)	Content (A-Daily achievements, M-Medical, C-Calendar Events, R-Reminders, T-Test Results, HW-Homework, DD-Day to day organisation)	Additional Comments	