

‘AACtion Heroes’: Exploring child-led
interactions and practices for hearing the
views of children who use hi-tech AAC

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PhD 2021

‘AACtion Heroes’: Exploring child-led
interactions and practices for hearing the
views of children who use hi-tech AAC

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A thesis submitted in partial fulfilment of the
requirements of Manchester Metropolitan
University for the degree of Doctor of
Philosophy

Faculty of Health and Education

2021

Abstract

This research is underpinned by the principle that all children have the right to express their views (United Nations, 1989) and have those views taken seriously (UNICEF, 2021). This includes children who use minimal or no speech to communicate who may express themselves through other modes. This thesis presents an exploration of practices for hearing the views of children with complex communication needs (CCN) who may use augmentative and alternative communication (AAC) systems. In addition, it details the characteristics of interactions mediated through hi-tech AAC whilst interlocutors are engaged in child-led practices.

The thesis describes the development of 'AAction Heroes': a child-led approach for exploring the views of children who use hi-tech AAC and their peers with CCN in a special education setting. The research then uses a qualitative lens to explore child-led practices for hearing the views of children who use hi-tech AAC and examines the participants' interactions when engaged in these child-led practices. It also explores how adults in a special education setting contribute to the process of being child-led and examines the viability of AAction Heroes from the perspective of the participants.

The findings offer broad ethnographic insight into how participants heard and acted on the views of a child who uses hi-tech AAC while participating in AAction Heroes. They also provide a detailed, visual, investigation into the minutiae of the child's interactions with various interlocutors. Subsequently, this thesis has two contributions to knowledge: (i) it adds to child-led participatory methods for hearing the views of children who use AAC in research and in their everyday school setting (ii) it adds to what is known about interactions mediated through hi-tech AAC in a special education setting.

Acknowledgements

I would like to begin by conveying my thanks to all the children and adults who participated in this study. It involved giving time and energy to try something new within your already busy lives and I am truly grateful.

I would like to thank my Director of Studies Professor Janice Murray. I have been inspired by your considerable skill in making the esoteric appear accessible, and seemingly effortless ability to provide exactly what is needed at just the right time: academic insights, instruction, reflection, motivation, reassurance, and empathy. You are an excellent mentor, and I will miss our discussions. I have huge admiration and respect for all my supervisory team Professor Janice Murray, Professor Juliet Goldbart and Dr Jen Whittle. Thank you for offering different but always constructive perspectives on my PhD journey. I would also like to thank Dr Yvonne Lynch for her academic and emotional support at the beginning of this project.

My family and friends have been unerring in their support for me. I would like to thank my husband James for his patience and problem-solving so I could give this PhD the time required whilst enjoying our life together with our daughter Gwenna. I would also like to thank my daughter's grandparents for putting in a considerable number of childcare hours to make undertaking a PhD possible for me: Jenny Roberts and Anthony Price, Gail Hrastelj, Peter Hrastelj and Alison Hrastelj. Thank you also to aunty Rhi for the office space, coffee, and moral support. I am also grateful to all my friends who have listened to my ideas and spurred me on. I would like to extend a special thanks to my good friend Dr Scarlett Brown for her endless proof reading, as well as being an ideological sounding board, emotional rock, and crafter of the famous 'Get It Done' playlist.

Finally, I would like to dedicate this thesis to Poppy Jones who first introduced me to the concepts underpinning this research. Thank you for always saying what you think and acting on your ideas.

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1.0. Chapter 1: Introduction

The United Nations Convention on the Rights of the Child (UNCRC) (United Nations, 1989) enshrines children's rights to freedom of expression which includes the expression of personal views and participation in decisions about their lives (Gillett-Swan and Sargeant, 2018). These concepts are expressed clearly in articles 12 and 13:

Article 12. Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.

Article 13. The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice.

(UNCRC, 1989)

These articles make an important connection between having your views heard and the variety of media children may use to express themselves (Bradwell, 2019). The UNCRC (United Nations, 1989) makes it clear that vocal speech is not the only way in which children's views can be heard and that children who use limited or no speech to communicate have the same rights as all children (Gallagher et al., 2018). Nevertheless, children who do not use natural speech to communicate are at risk of being ignored or silenced despite having unique views and perspectives of their own. Augmentative and Alternative Communication (AAC) systems are designed to provide modes of expression that do not rely on speech abilities. However, numerous barriers remain for children who use AAC to express their views (Baxter et al., 2012). This research is an exploration of child-led interactions and practices which may begin to address these barriers.

1.1. Structure of the thesis

The thesis is structured in seven chapters. Chapter one introduces the context and impetus for this study, summarises the research problem and purpose, provides my background as a researcher and key terminology relevant to this study. Chapter two describes AAC and communication through hi-tech AAC systems. It presents a review of the literature underpinning the study including participatory research with children who use hi-tech AAC, and studies of interaction mediated through hi-tech AAC in the special education setting.

Chapter two concludes by summarising the literature before setting out the pilot study question. Chapter three details the pilot study in full, revisits the literature, and subsequently provides context for the main study aims and research questions. Chapter four details the main study methodology. It sets out the philosophical position and theoretical underpinnings of the research; it then outlines the rationale for research methods before describing the procedures for data collection and analysis. Chapter five will present the findings of the study and is structured around the four main study research questions. Chapter six discusses this study's findings in relation to the existing literature. Chapter six concludes by detailing the strengths and limitations of the study. Chapter seven will outline the conclusions and associated recommendations from this study and summarises some avenues and potential questions for clinical practice and future research. Chapter seven concludes with my personal reflections on this research journey.

1.2. Context and impetus for the study

In recent years, AAC stakeholders' views have informed approaches to research delivery and clinical intervention more explicitly. In the UK the Identifying Appropriate Symbol Communication (I-ASC) project was a ground-breaking study funded by the National Institute for Health Research (NIHR) carried out between 2016 and 2019 (Murray et al., 2020). It explored the recommendation processes involved in the assessment and provision of communication aids across the UK. Findings described how current recommendations were informed by the views of AAC users, families, and professionals (Murray et al., 2020). I-ASC also had two co-researchers with lived experiences of the processes being explored in the research. These individuals supported the conceptualisation and delivery of the I-ASC research. The research study presented here was borne out of a desire to build on the work of the I-ASC project, to go beyond the assessment process, by exploring AAC interventions from the perspectives of school-aged children who use communication aids. Through an initial exploration of the literature in this area, it became apparent that children who use AAC are rarely consulted about any aspect of their lives and when they are it is largely in research studies related to their disability (Wickenden and Kembhavi-Tam, 2014). In contrast, it is increasingly common and expected that typically developing school children will be asked their views on a range of topics and be included in decision making (UNICEF,

2021). For example, many schools in the UK and across the world have adopted the UN Convention on Children's Rights (UNCRC) (United Nations, 1989) and aim to be 'Rights Respecting': ensuring school-aged children understand they have the right to say what they think, participate in decisions about their lives, and influence wider society (UNICEF, 2021). This led me to reconsider asking children who use communication aids about their AAC interventions and think more broadly about how they might express their views on their everyday lives as their typically developing peers do. Consequently, I began exploring the ways in which children who use hi-tech AAC may have their views heard in their school setting from a children's rights perspective.

1.3. Research problem and purpose

Children who use hi-tech AAC have the same rights as all children to express their views and be taken seriously. However, for school-aged children who use hi-tech AAC, there are many barriers to having their views heard including their complex communication needs (CCN), the beliefs of the adults who support them, and the wider expectations associated with the school culture and society's values. Further research is needed to establish how to overcome these barriers and ensure children who use hi-tech AAC can have their views heard and taken seriously in their everyday lives. This research aimed to explore the processes involved in taking a child-led approach to hearing the views of children who use hi-tech AAC in their special education setting.

1.4. Research approach

This research was qualitative and exploratory. Participants were recruited to both a pilot and main study and included children who use hi-tech AAC (n= 3), their peers with CCN (n= 4), and familiar support staff (n= 5). The pilot study developed and refined 'AAction Heroes', a child-led group approach to hearing the views of children who use hi-tech AAC and their peers with CCN. The main study was a quasi-naturalistic experiment, in that it asked participants to trial potentially novel child-led practices in their everyday special school setting as a means of hearing the children's views. The main study sought to qualitatively examine the participants' interactions within the child-led context, establish what adults in a

special school setting needed to contribute to the process of being child-led, and explore the viability of AACtion Heroes from the perspective of the participants.

1.5. Researcher perspective

At the time of conducting this study, I was a practicing speech and language therapist (SLT) working for the NHS specialising in supporting children with complex communication needs (CCN). Part of this role involved training learning support assistants (LSAs) in CCN and AAC across four special education settings. Before qualifying as a SLT I was a LSA in a mainstream school for a child with CCN who used a hi-tech AAC system. I also worked as a community support assistant for children and young adults with CCN in their homes. However, I did not know the participants in this study before conducting the research and did not recruit via my role as an NHS SLT.

My background has been beneficial in terms of understanding the research problem and bringing practical experience and insight to the research design and special education setting. These same background experiences will have impacted the research design and influenced my planning of the research and interpretation of the findings. I have attempted to overcome potential pre-conceptions and assumptions, or bias that could be caused by them, through reflexivity and writing personal critical reflections. I have considered the implications of my own identity within the research, as an able-bodied, articulate, white, Welsh woman in her thirties, conducting research with children with CCN who may use AAC. I have attempted at every stage to maintain qualitative rigour, triangulating my data, and having frequent discussions with my supervisory team and colleagues regarding processes of data interpretation. However, the interpretations remain my own and I recognise that other interpretations are possible and valid.

1.6. Key terminology

Various terms are used to describe communication impairments and difficulties in using vocal speech to communicate. For example, Severe Speech Impairment (SSI), and Complex Communication Needs (CCN). Whilst terms such as SSI intimate a difficulty with (vocal) speech, CCN is an umbrella term for severe speech, language, and communication impairments which may include difficulty understanding and using spoken language as well

as intellectual, physical, or sensory difficulties which impact communication. The term CCN recognises that people who use AAC may have other communication needs beyond that of using vocal speech. Nevertheless, it is not ability focussed and some authors (and AAC users) prefer terms such as 'aided communicator', 'child who uses AAC' and 'AAC user' which do not describe an impairment or deficit but emphasise what a person can do and recognises the skills involved (von Tetzchner, 2018). In this thesis, the term 'child/ren with CCN' is used to describe children who might have difficulties with more than one facet of communication, including vocal speech. Ability focussed terms such as 'child who uses AAC' are used to describe children with CCN who use AAC systems.

Various authors and disciplines define 'hearing children's views', and the concept of 'the child's voice' differently (Murray, 2019). In this thesis, the concept of child/ren's voice/s denotes agency. Views are not just heard but taken seriously and acted on by adults who are attempting to listen. This study aimed to ensure children experienced the power of their communication by seeing that having their voices heard resulted in some change or difference to their lives. In this way, this thesis echoes Murray's (2019) sentiment; hearing 'the child's voice' is important for their personal identity, agency and empowerment. For children who use AAC, hearing the child's voice means listening to *and acting on* multiple modes of communication and is not limited to vocal speech. It involves paying attention to what is important to the child through their multi-modal expression as well as understanding that issues which appear small or insignificant to an adult should not be ignored or discounted as they may be meaningful to a child. Other terms pertinent to explaining this study are included in the glossary (8.0). They are offered for ease of reference whilst reading the thesis.

2.0. Chapter 2: Literature Review

2.1. Introduction

This chapter will present a review of the literature that underpins this study and the context for the development of the research questions. The chapter is structured across five sections. The first section (2.2) describes the context for the study. It begins by explaining the study's underlying principle: that all children have the right to express their views, including those who have complex communication needs (CCN) and may use augmentative and alternative communication (AAC). Section 2.2. also outlines the complexity of communicating through hi-tech AAC devices. Section 2.3. will outline contemporary research studies which have sought the views of children who use hi-tech AAC and presents a structured review of methods identified within these studies for ensuring these children can participate in research about their lives. Section 2.4. describes the characteristics of interactions involving children who use hi-tech AAC and includes a structured review of AAC interactions in the special education setting. The chapter concludes with a synthesis and summary of the participatory and interaction literature (2.5) and the research questions (2.6).

2.2. Hearing the views of children who use hi-tech AAC

2.2.1. Children's right to express their views: rhetoric and realisation

Children have the right to express themselves and be heard; say how they feel, be listened to, and taken seriously (United Nations, 1989; UNICEF, 2021). There is a recognition that all children, including those with CCN who may use AAC have a right to express their views (McLeod, 2018). However, significant barriers remain in realising the rhetoric of children's

rights to expression (Gillett-Swan and Sargeant, 2018; Bradwell, 2019) especially for children with CCN (Gallagher et al., 2018).

Gillett-Swan and Sargeant (2018) argue that although children spend a significant amount of time at school, children's right to participation is limited by educational settings partly due to the attitude and knowledge of adults. For example, adults in the educational setting have control over "what, when and how children can communicate, and the extent children's views and opinions are sought, considered or incorporated" (Gillett-Swan and Sargeant, 2018, p. 120). Traditional pedagogies place the teacher and student in a hierarchical relationship where children receive an education, rather than participate in its delivery, meaning children's views may not be sought or incorporated into school practice (Gillett-Swan and Sargeant, 2018). Furthermore, adult educators may privilege spoken word and written texts over other means of expression (Gillett-Swan and Sargeant, 2018; Bradwell, 2019) suggesting that children with CCN are at increased risk of not being consulted or having their views taken seriously (Gallagher et al., 2018; McLeod, 2018). Some of the barriers for hearing the views of children with CCN is due to a lack of knowledge and approaches for consulting them (Bailey et al., 2015). That is, adult educators may be aware of and recognise the rights of children with CCN to voice their views, but little guidance exists on how they might achieve this in their education setting (Gallagher et al., 2018).

Researchers are beginning to suggest ways in which children might actively participate in decisions about their lives in the school setting (Gillett-Swan and Sargeant, 2018; Bradwell, 2019) including children with CCN (Gallagher et al., 2018; Ware, 2019). Gallagher and colleagues (2018) suggest that Speech and Language Pathologists/Therapists¹ have an integral role in ensuring children with CCN can participate in decision making at school, which begins by embedding children's right to participation in everyday practice. That is, SLTs can support children's decision making and agency by working collaboratively with the adults who support them every day. Central to their suggested approach is for SLP/Ts to move away from a top-down 'expert' model of working where they withdraw children from class for intervention and give teachers advice, and instead move toward a collaborative model of working whereby SLP/Ts and teachers are partners in the everyday work of the classroom, and barriers for children's participation are identified together

¹ SLP is the North American term

(Gallagher et al., 2018). The authors suggest using a framework of questions to guide collaborative discussion with the teacher, but detail is lacking in terms of how children themselves might be consulted beyond having multiple conversations using multi-modal communication (Gallagher et al., 2018). Similarly, Gillett-Swan and Sargeant (2018) argue that education settings need to recognise children's communication potential beyond linguistic expression so that their views can be heard through multi-modal means. However, there is a lack of detail as to what this might look like in the everyday school setting. Ware (2019) highlights the need to find ways of hearing the views of children with CCN in the school setting so that they can genuinely contribute to their health and education plans. Ware (2019) stresses that investment in training and resources for educators and professionals may be required and methods may need to be as diverse as the children themselves. For example, whilst some children with communication impairments could respond multi-modally to abstract questions about their general school experience, children with profound and complex difficulties may need to be supported to participate in a specific educational activity before gathering their views about whether they would want to repeat the experience (Ware, 2019).

Children who use AAC have the right to express their views and participate in decisions about their lives. There is agreement on the rhetoric surrounding children's rights and the need to uphold these rights in the education setting. However, there is little consensus on how this might be realised for children with CCN who may use AAC, and it is not clear how barriers to hearing their views may be overcome. Recommendations to date involve collaborative working between SLTs and educators (Gallagher et al., 2018), identifying multi-modal methods for hearing children's views (McLeod, 2018; Bradwell, 2019; Ware, 2019), and addressing the wider school culture and pedagogy, including the attitude and knowledge of adults (Gillett-Swan and Sargeant, 2018). Hearing the views of school-aged children who use AAC, on any topic, is not a simple task. It is impacted by the child's CCN, the beliefs of adults who support them at school, and the wider expectations associated with the school culture and society's values.

2.2.2. Children who use AAC

It is estimated that approximately 97 million individuals worldwide have a disability which impacts the development of natural speech (Light et al., 2019a). The term augmentative and alternative communication (AAC) describes any method of communication which supports (augments) or replaces (alternative) spoken language. Research suggests that in the UK, 536 people in every 100,000 (0.5% of the population) have a communication difficulty and may benefit from AAC (Creer et al., 2016). This number is likely to increase with an ageing population and increased survival rates of children with CCN (Enderby et al., 2013). Whilst AAC can be beneficial for a wide range of children and adults (Creer et al., 2016), this study focuses on children with developmental rather than acquired disabilities, i.e., disabilities that are present from birth, rather than because of injury or childhood illness. CCN are associated with a range of medical diagnoses including Down's Syndrome, cerebral palsy, learning disabilities (LD), autism spectrum disorders (ASD), rare genetic syndromes, and various other developmental disabilities. Having minimal or no speech arises for a range of reasons and can be associated with motor, neurological, cognitive, and social communication difficulties (Beukelman and Mirenda, 2013). This means that children who use AAC may have age-appropriate understanding of language or, have varying degrees of impaired understanding and expression of language, in concurrence with varying degrees of impaired sensory functions (seeing and hearing); mobility functions; and intellectual functions (Pennington et al., 2007). These factors will all influence the reasons why children may benefit from using AAC, as well as impacting their ability to access and use AAC systems.

2.2.3. AAC modes

There are various modes of AAC systems which are broadly described as: no-tech, low-tech, light/mid-tech and hi-tech (ACE Centre, 2021). No-tech systems rely only on bodily movements including gesture and eye-pointing but can also include systems with linguistic structure and form, such as signing. Low-tech systems utilise material artefacts and include photographs, symbol and word boards; light-tech systems are typically battery operated with an inbuilt microphone for recording anywhere between 1 and 128 messages (Communication Matters, 2021) and a paper-based overlay representing the message

stored at each key (ACE Centre, 2021); hi-tech systems are computer-based technologies with complex speech output capabilities known as VOCAs (Voice Output Communication Aids) in the UK and SGDs (Speech Generating Devices) in the USA (Murray and Goldbart, 2009a). The taxonomy around AAC modes can be contentious as terms such as ‘low’ and ‘hi(gh)’ connote a hierarchy. In reality, no single AAC mode is intrinsically superior, and many people use a combination of AAC modes depending on the context of the interaction. To emphasise this some clinicians and researchers use the terms ‘paper-based’ and ‘power-based’ systems (Judge et al., 2017). All possible terms are used within this thesis but the use of low-tech and hi-tech are not hierarchical and are only used to distinguish between AAC modes.

2.2.4. Hi-tech AAC systems and access methods

Hi-tech AAC technologies have dynamic screen displays, usually organized as a grid, whereby each button (or cell) can be pressed and either ‘speaks’ a word or links to another page (Waller, 2019). Language is represented by linguistic graphic symbols (Pampoulou, 2017) usually as a picture with an orthographic word written below: typically, a standardised set of symbols such as Wigit, SymbolStix, or Picture Communication Symbols (PCS) are used (Liberator, 2021). The device is usually a dedicated communication aid with specific software packages designed for different stages of language development (Waller, 2019) and methods of communication.

Children who use hi-tech AAC may access the system directly, for example, by pressing the device touchscreen with their finger. For children with physical impairments direct access may be possible through using eye-gaze technology whereby an infra-red camera monitors the child’s direction of eye-gaze and selects a cell when the child holds their gaze in a fixed position (Karlsson et al., 2021). If a child has good head control, a lightpointer can be worn on their head which transmits a beam to the communication aid and selects a cell (Communication Matters, 2021). Indirect access with a switch is also possible for hi-tech AAC users with physical impairments that restrict direct access of a device. For example, a switch can be used to initiate a scanning interface which will scroll through blocks, rows, or single cells on the device screen until the user presses the switch again, subsequently selecting that cell (Communication Matters, 2021).

2.2.5. Utterance construction

It is tempting to assume that a VOCA is a simple replacement for speech; however, there are stark differences between producing spoken utterances and aided utterances. Howery (2018) articulates this disparity in her phenomenological study into the lived experiences of teenagers who use VOCAs at school:

For those who speak there is not thinking about speaking, there is only speaking what we are thinking. Navigating in the time stream of spoken language seems quick, easy, and effortless. Yet this hardly seems to be the case for people who must use an SGD [VOCA] to speak their thoughts aloud.

(Howery, 2018, p. 40)

The following series of video stills illustrates a child using a VOCA to build a sentence independently (figure 2.1) and goes some way to explaining the processes involved in constructing an AAC utterance.

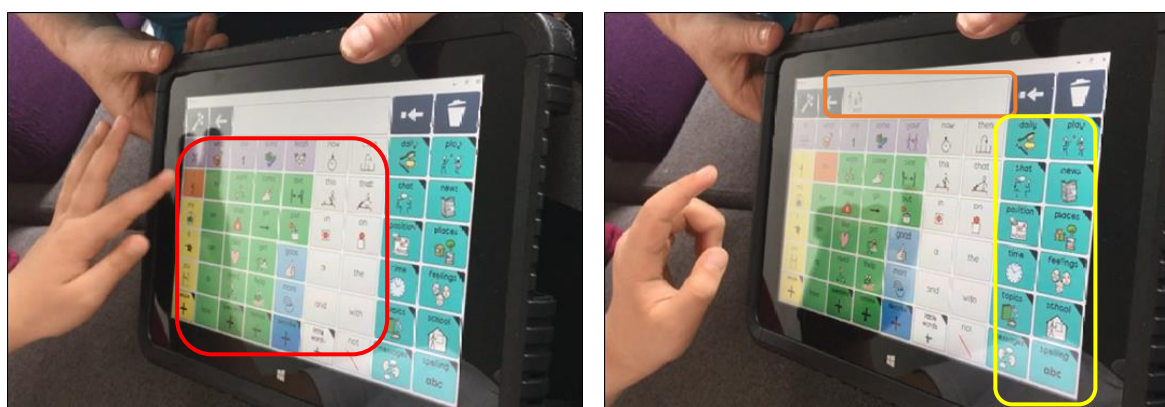
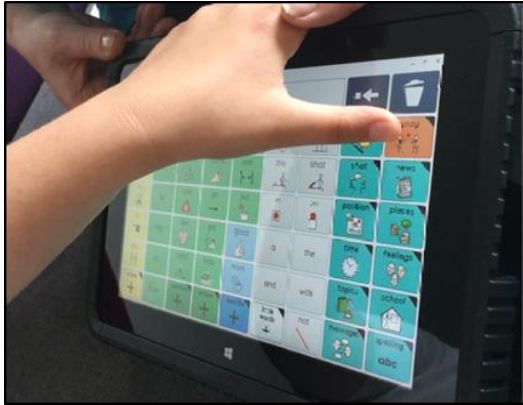


Figure 2.1: VOCA home screen

Figure 2.1 shows the VOCA home screen. This is where the child starts to build his sentence. The red rectangle highlights core vocabulary such as pronouns, verbs and prepositions. This means the child can generate the sentence *“I want to read”* using one screen. The orange rectangle in the adjacent photograph indicates the sentence window where the chosen words are put together. The VOCA speaks each word as they are selected. However, on completing the sentence, the child may press the sentence window and the whole sentence will be spoken together. The yellow rectangle highlights folders of vocabulary such as feelings, school, and places. These buttons will not generate speech output but will move on to another screen so that the child can choose the next word. So far, in this example, a four-word utterance has been constructed navigating a single screen.

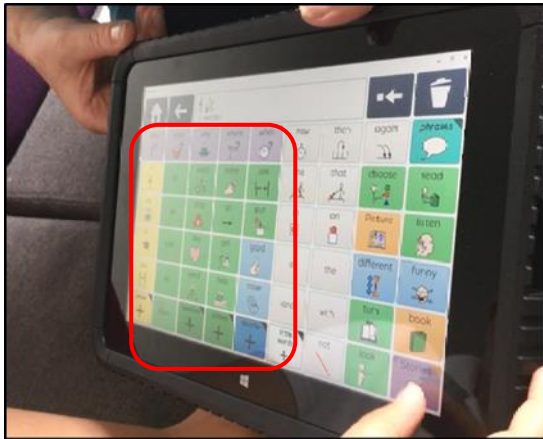
Figure 2.2. should be viewed from left to right and shows how the child must navigate through folders of vocabulary to find the next word in the sentence.



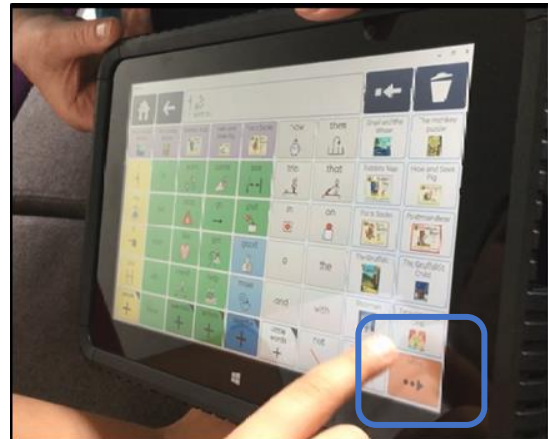
1. PLAY



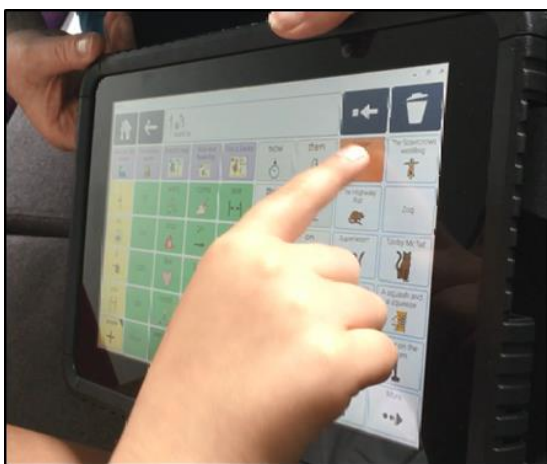
2. READING



3. STORIES



4. MORE



5. "Tiddler"

Figure 2.2: Navigating folders on the VOCA

The child now navigates through four more screens before finding the word he wants. Notice that the core vocabulary (highlighted in red) remains the same whilst the topic vocabulary changes as he navigates through the folders PLAY, READING and STORIES. However, because the screen contains his core vocabulary, the space for topic vocabulary options is constrained meaning he uses the 'more' arrow (highlighted in blue) to find more vocabulary in the STORIES folder. He has now found the story title 'Tiddler' which is added to the sentence window and spoken. He has now generated a five-word utterance navigating five screens: *"I want to read Tiddler"*. A natural speaker may have constructed this sentence in around 2 seconds: it took this child 13 seconds to construct this sentence using hi-tech AAC.

2.2.6. The unique achievement of expression through hi-tech AAC

Communicating through AAC is not only more time consuming. The sequence in figure 2.2. illustrates the unique processes involved in communicating through hi-tech AAC systems. Consider the multi-faceted cognitive, linguistic, pragmatic, and motor processes involved in expressing the sentence *"I want to read Tiddler"*. They include: thinking about and forming the mental representation of the intended message; switching attention from the communication partner (the intended recipient of the message) to the AAC system; seeing and searching for the desired vocabulary; understanding/decoding the symbol and/or orthography of each cell; activating the cell through gross and fine motor movements; remembering the location of words in the AAC system's folders; applying the grammatical rules of the language (in this case English) to the word/symbol order; activating the completed sentence through moving a finger; switching attention from the AAC system back to the communication partner to monitor their response; and perhaps sharing attention with the communication partner to the subject of the utterance, for example, the book 'Tiddler'. Communicating through hi-tech AAC therefore requires a range of skills including: attending to and visually scanning the screen (Ratcliff, 1994; Robillard et al., 2013; Perrin et al., 2017); language comprehension (Murray and Goldbart, 2009a); joint attention between the communication partner, the AAC system, and object of interest (Benigno and McCarthy, 2012; Clarke, 2016); visual perception and scanning skills (Murray and Goldbart, 2009a; Stadskleiv et al., 2018); graphic symbol knowledge (Batorowicz et al., 2018; Deliberato et al.,

2018); working memory (Light and Drager, 2002; Murray and Goldbart, 2011; Thistle and Wilkinson, 2013); knowledge of syntax and grammar (Murray and Goldbart, 2009b; Solomon-Rice et al., 2017); physical mobility (Raghavendra et al., 2007) including postural control and dexterity (Murray and Goldbart, 2009a); and pragmatic and social interaction skills (Ganz et al., 2017).

Children with CCN experience a range of cognitive, linguistic, pragmatic and mobility differences to communicate through hi-tech AAC (Murray and Goldbart, 2009b; Raghavendra et al., 2007; von Tetzchner, 2018). Becoming an aided communicator is not an easy journey (Smith and Murray, 2011) and the development of aided language is a dynamic process, “not a deficit but rather an achievement” (von Tetzchner, 2018 p. 4). Therefore, any research which aims to hear the views of children who use hi-tech AAC must take communication differences into account and should not be guided by perceptions of deficits and impairments but be underpinned by respect for children’s achievements.

2.2.7. Summary

All children have a right to have their views heard, regardless of their communication needs. Vocal speech is not the only way that children’s views can be heard, and children with limited or no speech have the same rights as their typically developing peers; however, there are barriers to realising this rhetoric. In school settings, the rights to be heard and taken seriously are limited partly due to adult attitudes and knowledge. Further to this, some adult educators may respect children’s rights to have their views heard, but do not have guidance on how to achieve this with children with CCN in their education setting. There is little consensus on how barriers to hearing their views may be overcome. AAC systems are not a simple replacement for speech and asking children who use hi-tech AAC their view on any issue is not straightforward (von Tetzchner, 2018). This makes hearing the views of hi-tech AAC users more complex than simply ‘asking’. An exploration of ways in which we might hear the views of children who use hi-tech AAC seems purposeful to ensure they experience the same right to being heard as their typically developing peers. It is helpful therefore, to explore existing methods for hearing the views of children who use hi-tech AAC in participatory research.

2.3. Child-led and participatory research with children who use hi-tech AAC

2.3.1. Participatory research with children

Participatory research with children has its philosophical roots in the sociology of childhood (Christensen and James, 2008). Historically, children have been viewed as vulnerable, irrational, and incapable of reliably expressing their experiences, so their views have been sought through proxies such as parents and teachers (Dockett and Perry, 2007). Modern shifts in the sociology of childhood challenged these concepts and proponents of the paradigm argue that children are competent social actors (James and Prout, 1990; James and Prout, 2014) with the right to choose and take actions independently of adult caregivers (Lloyd-Smith and Tarr, 2000). Thus, participatory research aims to be child-led and ensure research is conducted *with* rather than *on* children (Alderson and Morrow, 2011).

Participatory research with children is underpinned by a children's rights perspective (Wickenden and Kembhavi-Tam, 2014). Adult researchers aim to hear children's views and perspectives by ensuring participants can express themselves through child-friendly media (Barker and Weller, 2003; Greene and Hogan, 2005). Nevertheless, there are varying levels of participation with different studies using the term differently (Rix et al., 2020). For example, some studies define themselves as participatory if they consult children on a pre-defined issue, whilst others involve children at each stage of planning the project including setting the topic for investigation (Groundwater-Smith et al., 2015). Groundwater-Smith *et al* (2015) caution that although consultation and participation are related in terms of valuing children's perspectives, they are not synonymous terms. The authors offer useful definitions of consultation and participation which highlight the differences:

Consultation elicits information from children and young people that can be used by adults to influence policies and practices that directly affect children and young people. Consultation tends to be driven and controlled by adults.

Participatory processes seek to develop partnerships between children and young people and adults and provide opportunities for children and young people to shape the project, both in terms of the processes and the outcomes.

(Groundwater-Smith et al., 2015, p. 13)

Studies that consult children are interested in hearing children's perspectives to inform adult-led practices. However, participatory research facilitates children to co-create the

research in partnership with the adult researcher/s (Clark, 2017). Both may be underpinned by a children's rights perspective and aim to be child-led to some degree, yet the level to which children can lead and shape the research processes and outcomes differs.

2.3.2. Participatory Action Research with children

Participatory Action Research (PAR) has underlying democratic and participatory principles and aims to help people understand their local situation by facilitating them to resolve the issues they believe are important through dialogue (Kagan et al., 2008; Guba, 2014). PAR does not just consult its participants, rather, participants *co-produce* the research through engaging in a reflective cycle with the researcher, so that the participants themselves are researchers who identify the research problem, gather and analyse the data and use the findings to take action on their local situation (Baum et al., 2006). PAR has been conducted with typically-developing children but it is recognised that adaptations to the PAR methods used with adults are required to ensure children can participate meaningfully (Dale and Roberts, 2016; Clark, 2017). For example, Clark and Moss' Mosaic Approach (Clark, 2017; Clark and Moss, 2011) is a three-stage cycle methodology based on PAR in which children and adults; gather and construct documentation together, reflect on and discuss the information gathered, and decide on what should be continued or changed (Clark, 2017). This is done using multi-methods that do not require verbal skills such as: child-led tours of the space, children's photography, map-making, and adult observations of the children in their nursery setting (Clark and Moss, 2011; Clark, 2017). The authors do not describe research as *co-produced* as it is the adults who wish to redesign the nursery setting and are initiating the child-led research activities. Yet the processes of finding out what is important about the setting and what the outcomes should be are *co-created* with the children (Clark, 2017). PAR has been conducted with typically-developing children, including those who are young and pre-verbal using co-creative research methods (Clark and Moss, 2011; Clark, 2017).

2.3.3. Participatory Action Research with children who use hi-tech AAC

Whilst PAR studies conducted with typically developing children are increasing (Dale and Roberts, 2018), similar projects with children with communication and other disabilities

remain scarce (Wickenden and Kembhavi-Tam, 2014). To date, most participatory studies involving children and young people who use hi-tech AAC have *consulted* them about their experiences of; social participation (Batorowicz et al., 2014), leisure activities (King et al., 2014), social media and online experiences (Hynan et al., 2014; Hynan et al., 2015; Caron and Light, 2017). Some researchers report long-term ethnographic research encounters with children who use hi-tech AAC which allowed them to forefront child-led topics in their research outputs, i.e., school experience (Howery, 2018) and friendships (Wickenden, 2011a). All of these participatory studies represent a considerable step forward in attempts to be child-led and hear the views of children who use minimal or no speech. However, unlike PAR with typically-developing children, they do not explicitly aim to co-create the research with the participants so that changes or actions can be taken based on their views. This may be due to a lack of co-creative methods available for conducting PAR with children who use hi-tech AAC. Nevertheless, as with very young children who do not use speech to communicate, it may be that children who use hi-tech AAC could engage with co-creative PAR methods with the relevant adaptations. To explore this further, I conducted a structured literature review of participatory studies that have been conducted with children who use hi-tech AAC.

2.3.4. Structured literature review- participatory studies with children who use hi-tech AAC

Aim - To explore the potential of using co-creative methods with children who use hi-tech AAC as a means of hearing their views.

Question - What participatory methods have been used in studies which have directly sought the views of children who use hi-tech AAC?

2.3.5. Search strategy and terms

I did not conduct a systematic literature review as part of this research project. However, this structured literature review, and the review reported in section 2.4.4., used the PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) (Moher et al., 2010; Moher et al., 2015) principles and checklist. Soilemezi and Linceviciute's (2018) guidance for new reviewers on adapting PRISMA-P for qualitative studies was also an

invaluable tool for primary study identification, screening titles and abstracts, determining eligibility of studies, and synthesising findings (Soilemezi and Linceviciute, 2018).

The initial review of the literature aimed to find contemporary studies which had involved children who use hi-tech AAC in participatory action research. EBSCO host was used to conduct the search and included the following databases: ERIC, CINAHL, PsycINFO, Child development and adolescent studies, and MEDLINE. The initial search was conducted in 2017 and included the preceding ten years of research and has been updated to include recent publications, i.e., January 2007 - August 2021. The following search terms were used in Boolean phrases:

- AAC/Augmentative and Alternative Communication OR Voice Output Communication Aids (VOCAs) OR Speech Generating Devices (SGDs)
- AND Child*/teenager*/adolescents/youth
- AND participatory research OR action research OR participatory action research OR PAR

This generated 8 records, however, on reading titles and abstracts none of the studies sought the views of children themselves and many were intervention studies rather than examples of PAR. Subsequently I widened my search strategy to include any study that had sought the views of children who use hi-tech AAC. The following search terms were used in Boolean phrases:

- AAC/Augmentative and Alternative Communication OR Voice Output Communication Aids (VOCAs) OR Speech Generating Devices (SGDs)
- AND Child*/teenager*/adolescents/youth
- AND Views/opinions/perceptions/attitudes/beliefs/experience
- NOT parents/caregivers/professionals/teachers/speech and language therapists/pathologists

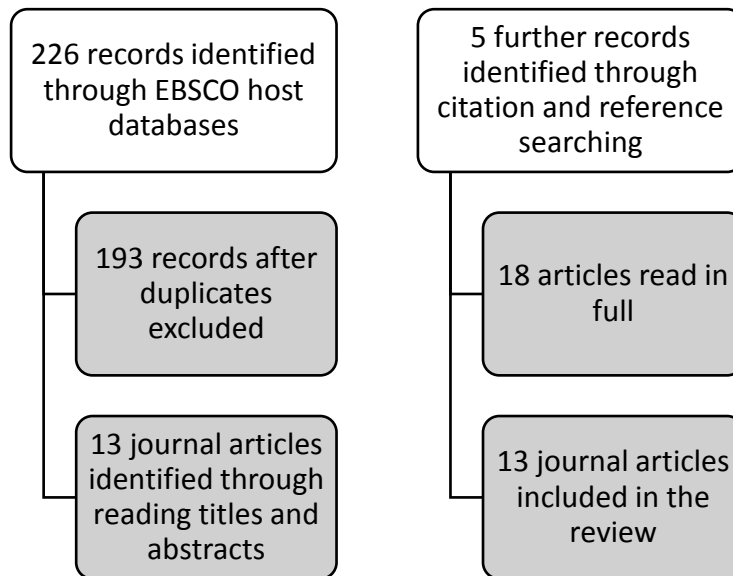


Figure 2.3: Identifying studies for review

Articles were included if they were primary studies that had sought the views of young AAC users directly, or if they had a methodological focus and described methods for accessing the views of children who use hi-tech AAC. Articles were excluded if they described interventions rather than people’s perspectives. Articles were excluded if they sought the views of proxies only, i.e., parents, professionals, typically developing peers or only the views of adults who use hi-tech AAC. However, the views of some young people over the age of 18 are represented within the participant cohorts in some studies (see table 2.1.). As shown in figure 2.3., 226 records were identified initially, 18 articles read in full, with a final 13 articles included in the review. The 13 studies included in this review are summarised in table 2.1. Two studies do not state the involvement of children who use hi-tech AAC, rather they describe using participatory methods with children who have CCN. However, they are included as they are the only examples of studies which describe PAR methodologies and/or using co-creative methods in research with children with CCN. This has specific relevance to the review question and no other study which consulted children who use hi-tech AAC described explicitly PAR or co-creative methods.

Table 2.1: Summary of studies included in participatory methods review

Authors and date	Title	Type of study and analyses	Participants	Setting
Ajodhia-Andrews, A. (2016)	Reflexively conducting research with ethnically diverse children with disabilities	Researcher's reflections on conducting participatory and narrative research with a group of children with CCN.	n= 6 aged 10-13 (group)	Non-profit centre.
Batorowicz, B., Campbell, F., von Tetzchner, S., King, G. and Missiuna, C. (2014)	Social Participation of School-aged Children Who Use Communication Aids: The views of children and parents	Face to face semi-structured interviews. Thematic content analysis.	n= 10 aged 5-15 (individual) (also interviewed parents separately)	Not described specifically – a quiet location.
Caron, J. G. and Light, J. (2017)	Social media experiences of adolescents and young adults with cerebral palsy who use augmentative and alternative communication	Online focus group. Thematic analysis.	n= 7 aged 14-21 (group)	Online.
Howery, K. L. (2018)	Out of Time: The Experience of Speech Generating Device Users	Phenomenological study of school experience. Phenomenological analysis of face-to-face interviews, online responses, and participant observation.	n= 7 age not specified - secondary school-aged	Education setting.
Hynan, A., Goldbart, J. and Murray, J. (2014)	'Happy and excited': Perceptions of using digital technology and social media by young people who use augmentative and alternative communication.	Grounded theory of face-to-face semi-structured interviews with participants and additional sources.	n= 25 aged 14-24 (individual)	Educational setting.
Hynan, A., Goldbart, J. and Murray, J. (2015)	A grounded theory of Internet and social media use by young people who use augmentative and alternative communication (AAC)	Grounded theory of face-to-face semi-structured interviews with participants and additional sources.	n= 25 aged 14-24 (individual)	Educational setting.

King, G., Gibson, B. E., Mistry, B., Pinto, M. and Goh, F. (2014)	An Integrated Methods Study of the Experiences of Youth with Severe Disabilities in Leisure Activity Settings: The Importance of Belonging, Fun, and Control and Choice	Mixed-methods; qualitative interviews with participatory methods and quantitative self-report questionnaire. Case-by-case (single-case) and integrated thematic analysis (case-series).	n= 12 aged 15-22 (individual)	At home or rehabilitation centre.
Midtlin, H. S., Tact, T. and Karlsen, A. V. (2015)	What communication strategies do AAC users want their communication partners to use? A preliminary study	Face-to-face Talking Mats™ interviews. Quantitative descriptive analysis of three possible responses to 28 questions.	n= 8 aged 10-17 (individual)	Educational setting.
Teachman, G. and Gibson, B. E. (2018)	Integrating Visual Methods with Dialogical Interviews in Research with Youth Who Use Augmentative and Alternative Communication	In-depth discussion of multi-method interviews used in authors' other study. (see below)	n= 13 aged 15-24	At home.
Teachman, G., McDonough, P., Macarthur, C. and Gibson, B. E. (2020)	Interrogating inclusion with youths who use augmentative and alternative communication	Multi-methods qualitative design using participant's photos and graphic representation of a 'Belonging Circle' to elicit views on inclusion in face-to-face interviews. Single-case and integrated case based narrative analysis.	n= 13 aged 15-24	At home.
Wickenden, M. (2011a)	Talking to Teenagers: Using Anthropological Methods to Explore Identity and the Lifeworlds of Young People Who Use AAC	Distributed ethnographic study utilising multi-methods (qualitative) across multi-sites. Iterative and inductive thematic analysis.	n= 9 aged 10-15	Home, educational settings, and extra-curricular clubs.
Wickenden, M. (2011b)	'Talk to me as a teenager': Experiences of Friendship for Disabled Teenagers who Have Little or No Speech	Narrative research utilising participant observation and narrative conversations with visual supports (part of larger study described above).	n= 9 aged 10-15	Home, educational settings, and extra-curricular clubs.

		Iterative and inductive thematic analysis.		
Wickenden, M. and Kembhavi-Tam, G. (2014)	Ask us too! Doing participatory research with disabled children in the global south	Researcher's reflections on methods used in two case studies conducting participatory research with groups of children with disabilities including those with CCN.	n= 37+ aged 8-11 aged 12-18 (group discussions involving 3 - 6 participants from each age group).	Educational setting, community, and NGO centres.

2.3.6. Type of studies and analyses

Most studies included in this review were qualitative, and utilised thematic or narrative analysis methods to forefront the perspectives and views of children who use hi-tech AAC (Wickenden, 2011a; 2011b; Batorowicz et al., 2014; Hynan et al., 2014; 2015; Caron and Light, 2017; Howery, 2018; Teachman and Gibson, 2018; Teachman et al., 2020). Two exceptions were Midtlin *et al's* (2015) study which used quantitative coding and analysis of symbol supported interviews to describe the views of 8 children (aged 10-17) on what strategies they wanted their communication partners to use, and King *et al's* (2014) study which integrated qualitative and quantitative methods for exploring the views of 12 young AAC users (aged 15-22) on their leisure activities. Most of the studies consulted children who use hi-tech AAC (Batorowicz et al., 2014; King et al, 2014; Hynan et al., 2014; 2015; Midtlin et al., 2015; Caron and Light, 2017; Teachman and Gibson, 2018; Teachman et al., 2020), two authors described long-term ethnographic approaches (Wickenden 2011a; 2011b; Howery; 2018), and two studies described methods for conducting participatory research with children with CCN (Wickenden and Kembhavi-Tam, 2014; Ajodhia-Andrews, 2016). Though children who use hi-tech AAC (or other AAC modes) participated at different levels in these studies, they were underpinned by a participatory ethos and all aimed to be child-led to differing degrees. Below, I will present a summary of the ways that researchers have taken a child-led approach to engaging children who use hi-tech AAC in research about their lives.

2.3.7. 'Hearing' visible actions as well as VOCA talk

Semi-structured interviews are commonly used in qualitative research with a range of participant groups and were used successfully by 5 studies in this review to ascertain the views of children and young people who use hi-tech AAC (Batorowicz et al., 2014; Howery, 2018; Hynan et al., 2014; King et al., 2014; Hynan et al., 2015). The participants were able to answer questions using their VOCA, yet all authors advise that video recording the interviews was essential to capture other non-verbal modes of communication. It is important that as well as talk, all aspect of the child's communication is considered in the data analyses as the VOCA is just one tool with which a child might communicate (Batorowicz et al., 2014). Indeed, Wickenden (2011a) highlights that the teenagers in her study expressed views using relatively few words even over a long-term (18 months) study. Ensuring children who use hi-tech AAC can participate in research about their lives means consideration of their communication modes including and beyond the VOCA (Teachman et al., 2020).

2.3.8. Using orthographic research methods

Communicating through a VOCA can be a slow process and lots of extra time is needed for children to express their ideas in face-to-face interactions (Howery, 2018). To overcome these issues, some studies have utilised online media where children can respond to questions at their own pace via an online focus group (Caron and Light, 2017) or in text-based chat forums with the researcher, e.g., Facebook Messenger (Howery, 2018). Hynan *et al* (2014; 2015) caution that using social media chat forums such as Facebook Messenger raises ethical issues regarding the relationship between the young participant and the adult researcher as these forums are typically used by friends, rather than professionals (Hynan et al., 2014). Arguably, email does not raise the same ethical questions and can help AAC users contribute their views without the time pressure of face-to-face interaction (King et al., 2014) or when meeting in person is not possible (Hynan et al., 2014). Nevertheless, online media require typed, orthographic responses. Studies which used online media included participants aged 14 and over which may be indicative of a good level of literacy (Hynan et al., 2014; King et al., 2014; Hynan et al., 2015; Caron and Light, 2017; Howery, 2018). Other

methods may be required for younger children or those who cannot convey their ideas adequately in writing.

2.3.9. Using non-vocal/symbol-based rating scales

Two studies in this review used quantitative analysis of rating scales to explore the views of children who use hi-tech AAC (King et al., 2014; Midtlin et al., 2015). King *et al* (2014) used a written questionnaire with a 7-point rating scale using oppositely labelled end points, e.g.: I had a say in things versus I didn't have a say in things. This meant participants did not have to construct responses via a VOCA but indicated their views from multiple, pre-determined choices. Nevertheless, all participants in their study were aged 15-22 and a written questionnaire with a 7-point scale of complexity may not be suited to younger participants.

Talking Mats™ (Murphy, 1998) is a symbol-based interview system that does not rely on strong literacy skills. The tool provides symbols representing positive, negative, or neutral feelings, e.g., like/maybe/don't like, and children are asked to place symbols relating to aspects of their lives in proximity to the feeling symbol that represents their view. In this way, symbols provide a visual reminder of the topic, can be used as an utterance (instead of the child's existing AAC system), and as a visual rating scale (Midtlin et al., 2015). However, Midtlin *et al* (2015) point out that there is a 33.3% chance the AAC user will guess or point to any of the symbols, so a child's answer may not actually reflect their opinion (Midtlin et al., 2015). In theory, children could elaborate on their answers using their other communication modes which may clarify their answers. Nevertheless, this approach requires the researcher to come to the child with pre-determined questions represented on visual cards and assumes the child has a pre-formed opinion about the topic. Visual symbols may support a child's understanding and ability to answer questions, but another means of determining the topic of discussion may be required to reflect the interests of the child, rather than adult researcher.

2.3.10. Using creative and visual methods

Photography

Photography was used as a means of exploring and eliciting the views of children who use hi-tech AAC (Wickenden, 2011a; Wickenden, 2011b; King et al., 2014; Teachman and

Gibson, 2018; Teachman et al., 2020) and those with CCN (Wickenden and Kembhavi-Tam, 2014). For example, Teachman and Gibson (2018) used photo elicitation to prompt discussion in interviews with adolescents and young adults who use hi-tech AAC. They provided the participants with disposable cameras and supported them to take photographs of things that were important to them before the interview so that their own images could be used to set the topic of discussion (Teachman and Gibson, 2018). The authors note a number of benefits to using the participant's own photographs including: taking photographs together facilitates collaborative interaction between the researcher and participants which establishes rapport; images represent things which are difficult to articulate; and participants can add captions to their images which help researchers understand their meaning (Teachman and Gibson, 2018). Wickenden and Kembhavi-Tam (2014) reported using photographs to discuss participant's feelings in focus groups by purposefully asking them to take photographs of things that made them happy, sad, angry, or things they would like to change before they attended the group discussion. Two groups of children with CCN (aged 8-15) were involved across two studies and the authors advocate the use of photographs to facilitate group discussion (Wickenden and Kembhavi-Tam, 2014). Photography can be used to visually indicate what is important to groups of children with CCN and individuals who use hi-tech AAC and may facilitate children to set the topic for discussion with the adult researcher.

Drawing

Ajodhia-Andrews (2016) advocates the use of drawing, alongside the child's verbal interpretation (which in theory could be a hi-tech AAC utterance), to give children time to reflect on how they wish to convey their thoughts and emotions. Conversely, Wickenden and Kembhavi-Tam (2014) caution that drawing is not always an enjoyable activity for children whose impairments may inhibit their ability to physically manipulate the materials. Hynan *et al* (2014) did not use creative methods with children who use hi-tech AAC because they must physically operate a VOCA and accessing creative research methods may have introduced a novel disabling factor (Hynan et al., 2014). Arguably, activities such as drawing may precipitate negative feelings of frustration and failure and lead to the child's unwillingness to participate in the research (Wickenden and Kembhavi-Tam, 2014).

Adaptations such as supportive seating, non-slip mats and large grip pencils can assist drawing, or adults may draw something as directed by the child (Wickenden, 2011). However, authors also advise using ready-made graphics (Teachman and Gibson, 2018), images, stickers, or computer-based drawing (Wickenden and Kembhavi-Tam, 2014). In summary, creative and visual methods may be beneficial to elicit the views of children who use hi-tech AAC, but adaptations need to be considered and a choice of methods should be available.

Ownership

As the only two studies reporting PAR, both Wickenden and Kembhavi-Tam (2014) and Ajodhia-Andrews (2016) emphasised the importance of ensuring their child participants felt a sense of ownership and genuine involvement in the study: researching *with* participants as co-researchers is a central tenant of PAR (Reason and Bradbury, 2008). One way the authors strived to achieve this was giving the participants independent control of the data collection research resources, for example, giving them disposable cameras (Wickenden and Kembhavi-Tam, 2014) or 'research kits' containing a camera, personal journal, and pencil case (Ajodhia-Andrews, 2016). In some cases, adult gatekeepers such as teachers voiced their concerns that the children may damage the cameras or would not be able to operate them yet both studies concluded that the children were proud of the equipment, kept them safe and personalised the resources they had been given (Wickenden and Kembhavi-Tam, 2014; Ajodhia-Andrews, 2016). Ownership and personalisation of research resources may be a tangible indication that the research is 'owned' by the child participants, and that research is being conducted with, rather than on, them.

2.3.11. Extending and repeating opportunities

Both Howery (2018) and Wickenden (2011b) argue that participant observation over many months and in some cases years, was vital in ensuring they understood the experiences and perspectives of their participants. However, such extended periods of engagement are not always possible or practical in participatory research with children who use hi-tech AAC. Nevertheless, time is a major consideration and even studies utilising semi-structured interviews note that interviewing children who use hi-tech AAC may take hours and/or

require more than one meeting (Batorowicz et al., 2014; King et al., 2014; Teachman and Gibson, 2018). Communicating ideas through hi-tech AAC may be fatiguing for some children and many encounters may be necessary for children to explore and articulate their views (King et al., 2014). In her phenomenological study into the experience of using a VOCA, Howery (2018) concludes that every child should be “given the gift of time to be heard” (Howery, 2018, p. 48). For children who use hi-tech AAC this may include extra time in a single research interview or activity, but also repeated opportunities (on different days) to express their views and experiences.

2.3.12. Valuing adult contributions

A central tenet of child-led research is to move away from using the views of proxies and caregivers and respect and value the views of the children themselves (Groundwater-Smith et al., 2015). Certainly, the same respect and value should be given to the views of children who use hi-tech AAC. Yet, at times, adults who know them well may be the very people who facilitate them to express their views. For example, children who use hi-tech AAC may also use naturally-spoken language which is not understood by the researcher but is clear to familiar people such as their parents (Teachman and Gibson, 2018). Some authors highlighted the need to respect this mode of communication, and stressed participants could choose to use a familiar communication assistant or partner to co-construct their responses in interviews if they wished, as this may be the child’s preferred method of communication (King et al., 2014; Teachman, 2018; Teachman et al., 2020). As well as co-constructing interview responses, some studies supplemented the data they gained from child participant interviews with other interview data from adults who knew them well such as parents (Batorowicz et al., 2014) or school staff (Wickenden, 2011b). Ajodhia-Andrews (2016) was the sole facilitator of a group of children with CCN and claimed her clinical SLT experience was sufficient to facilitate the children to talk about their school experiences. However, Wickenden and Kembhavi-Tam (2014) emphasised the importance of including parents and research assistants who knew the children well in their group discussion, both as means of reducing the children’s potential anxiety and ensuring their unique communication styles were understood. The views of children who use hi-tech should not

be sought solely through adult proxies, however, children may want and benefit from the presence of familiar adults who typically support their expressive communication.

2.3.13. Valuing peer contributions

Studies which sought the views of children and young people who used hi-tech AAC largely employed research methods on a one-to-one basis with an adult researcher or with another familiar adult present (Batorowicz et al., 2014; Gibson et al., 2014a; 2014b; Hynan et al., 2014; King et al., 2014; Hynan et al., 2015; Midtlin et al., 2015). This may be because children who use hi-tech AAC do not necessarily interact with other children who use hi-tech AAC in a group. For example, Caron and Light (2017) used an online focus group to explore the social media experiences of hi-tech AAC users because it could be accessed at any time and overcome the difficulty of the “geographical dispersion of the target population” (Caron and Light, 2017, p. 32). Wickenden (2011) described using data from small group discussions with her participants though it is not clear where these discussions were conducted or who was present for the discussions. Studies describing participatory action research with children with CCN promoted the exploration of the children’s ideas in a group as they could explore their thoughts and feelings together, i.e., the group context itself was a tool for exploring meaning (Ajodhia-Andrews, 2016). Wickenden and Kembhavi-Tam (2014) recommend establishing a group of children who all have CCN as they require extra time to express themselves and may find it challenging to voice their ideas in a group of children with diverse communication abilities. It may be that group exploration of ideas with peers (who also have CCN) would be beneficial for hearing the views of children who use hi-tech AAC.

2.3.14. Reflecting on adult authorship of children’s views

The studies in this review highlight that children who use hi-tech AAC co-construct the ‘telling’ of their views through their interactions with the researcher/s which may involve using their VOCA, natural gesture and actions, external artefacts such as photographs, and familiar communication partners. Indeed, as discussed above, adults have a valuable contribution to make as they may be the child’s preferred means of expressing their views. This raises considerations about authenticity of voice, and whether the views being

expressed are the child's own or influenced by the communication partner (Teachman and Gibson, 2018). However, VOCA utterances are typically short and lack detail (Batorowicz et al., 2014) or children may express their views non-verbally through gesture or with an image (Midtlin et al., 2015). This means researchers may have to interpret children's communication and translate their 'message' into more complex language so that they are understood by a wider audience (Ajodhia-Andrews, 2016). Thus, a tension exists between valuing the children's unique communication style and perspectives, and the requirement to 'share authorship' of the child's story (Wickenden, 2011b).

2.3.15. Summary of participatory research with children who use hi-tech AAC

Co-creating research with children who use hi-tech AAC is underexplored. Participatory research with primary-school aged children (ages 4 – 11) is limited with most studies consulting teenagers or young adults. Researchers in this field have gone to considerable lengths to find participatory research methods that do not rely on spoken data so they could genuinely consult children who use hi-tech AAC. Across studies which have consulted young people who use hi-tech AAC, there is a recognition that in addition to VOCA talk, the child's use of visible actions is essential to convey their views. Other material artefacts such as creative or visual methods should be provided with consideration of adaptations as necessary for individual participants. Further to the methods themselves, researchers note that children may require lots of time or many opportunities to express their views. Support from the people who know them well is required and the researcher needs to reflect on their interpretation and presentation of children's views when conveying them to a wider audience. Thus, tensions exist between the ethos of being child-led and the reality of adult-support required so that children who use hi-tech AAC can express their views and experiences. Finding a balance between adult-support and adult-control in participatory research with children who use hi-tech AAC may not be straightforward. Nevertheless, participatory, and child-led approaches need to be established for children who use hi-tech AAC. It is not enough to have progressive rights-based policy espousing the right for children with disabilities to have their views heard and taken seriously (MacAllister and Riddell, 2019). Real-world solutions for engaging people with communication impairments as partners in participatory research are required (Rix et al., 2020). Given the limited studies in

this area, exploring ways for school-aged children who use hi-tech AAC to engage with co-creative participatory research processes appears justified.

2.4. Interactions mediated through hi-tech AAC in the special education setting

2.4.1. Communication and interaction

Communication is understood as the sending and receiving of messages (Denes and Pinson, 2007). Typically, speech is thought of as the primary medium through which people communicate information to each other (Denes and Pinson, 2007). Yet, interactions are complex and involve much more than two (or more) people independently sending and receiving spoken messages. Conversations are collaborative and multi-modal. Co-construction in talk is the process by which two or more speakers anticipate and complete turns-at-talk together (Bloch and Beeke, 2008); this could be the joint construction of a single utterance, for example:

Adult A: We sometimes finish each other's

Adult B: Sandwiches

Here, two people collaborate in the co-construction of a single spoken message. Yet interactions depend on much more than spoken communication. In fact, everyday social interactions rely on the interplay between multiple communicative resources including talk, non-verbal actions, and material artefacts/objects in the interactional context (Higginbotham and Engelke, 2013). Interactions are the events in which people and things communicate with and respond to each other (Cambridge, 2021).

2.4.2. Co-construction in AAC interactions

Co-construction frequently occurs in everyday interactions between naturally-speaking people (Bloch and Beeke, 2008). However, in interactions involving an AAC user co-construction is a salient feature (von Tetzchner, 2018) with co-construction processes being more overt than in the conversations of natural speakers (Norén et al., 2013). Even aided AAC systems become a resource for both interlocutors to interpret (Norén et al., 2013) rather than a machine for sending one individual's message. Therefore, researchers tend to conceptualise the entire interaction as being *mediated through* AAC (Clarke et al., 2013),

rather than a conversation involving one AAC user and their naturally-speaking communication partner/s.

Research into AAC mediated interactions involving children who use hi-tech AAC frequently describe an asymmetric pattern of interaction as the naturally-speaking communication partner takes many more turns at talk (Sotiropoulou Drosopoulou et al, 2021), sets or changes the topic of conversation (Norén et al., 2013), and gives instructions, commands, or asks questions which oblige the AAC user to respond (Chung et al., 2012). Consequently, the speaking communication partner maintains control of how the interaction unfolds (Smith, 2015). It has been suggested that children who use AAC learn to be passive communicators (Basil, 1992) because they have limited opportunities to exert control over the conversation (Andzik et al., 2016). Understandably, concerns have been raised that children who use hi-tech AAC may come to rely on the support of communication partners rather than attempt to communicate themselves (von Tetzchner, 2018) and ways of encouraging children's active participation in their interactions need to be found (Sundqvist et al., 2010). Nevertheless, it has also been argued that children who use AAC may actively co-construct their interactions through modes other than aided talk, for example, through vocalizations, gaze, and bodily actions (Pilesjö, 2013; 2014). Furthermore, there may be some interactional situations where children and young people who use hi-tech AAC can exert more conversational control, for example, in multi-party (rather than dyadic) interactions (Sotiropoulou Drosopoulou et al., 2021) or at home with close family members (Savolainen et al., 2020).

2.4.3. Interactions in the special education setting

Special education settings in the UK provide education for children who have been identified as having Special Educational Learning Needs (SEND) or Additional Learning Needs (ALN) (Department for Education, 2019). Classroom sizes tend to be smaller than mainstream education provisions with a higher ratio of staff members to children (Obiakor and Bakken, 2019). Children are supported by their teacher and Learning Support Assistants (LSAs) who may attend to their learning and health needs in the classroom. As with mainstream education provisions, staff with a variety of roles will be on site, for example, the headteacher, senior management staff, administrative staff, classroom teachers, LSAs,

cafeteria and facilities staff (Welsh Assembly Government, 2015). However, special education settings also need to provide for the children's health needs therefore nurses and allied health professionals (e.g., SLTs, physiotherapists) may also be on site. Therefore, interactions mediated through AAC in this environment may involve adult educators and support staff, health professionals, and peers with a diverse range of health, learning and communication needs. The range of conversation partners in the everyday special education setting was considered when conducting a literature search of AAC interaction studies. This structured literature review is detailed below.

2.4.4. Structured literature review – interactions mediated through hi-tech AAC in the special education setting

Aim - To establish what was already known about interactions mediated through hi-tech AAC in the special education setting.

Question - What talk, visible actions, and material artefacts have been observed in the interactions between children who use hi-tech AAC, their peers, and adults in the special education setting?

2.4.5. Search strategy and terms

The literature search strategy described in section 2.3.5 was repeated here. The initial search was conducted in 2017 and included the preceding ten years of research and was updated to include recent publications, i.e., January 2007 - August 2021. In this updated search, the following search terms were used in Boolean phrases:

- AAC OR Augmentative and Alternative Communication OR Voice Output
Communication Aids OR VOCAs OR Speech Generating Devices OR SGDs
- AND Child*/teenager*/adolescents/youth
- AND interaction OR co-construction
- AND special* education OR special* school

Articles detailing the characteristics of AAC interactions were excluded if they described interactions at home or mainstream school, or, only reported on interactions using low-tech or paper-based AAC.

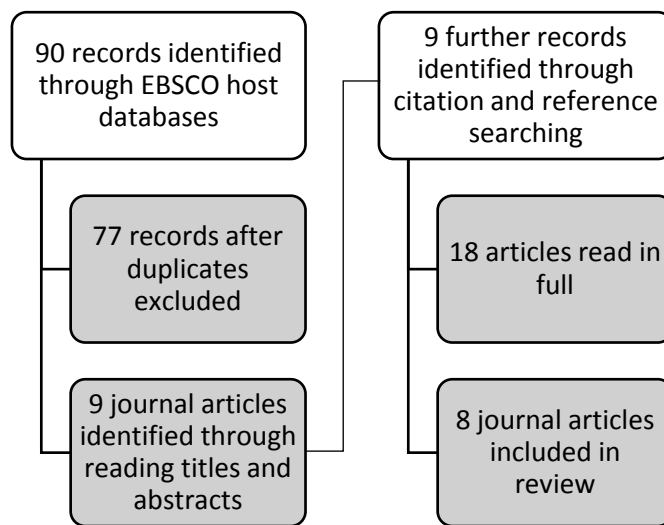


Figure 2.4: Identifying studies for review

As shown in figure 2.4., 90 records were initially identified and screened with 18 articles read in full. A final 8 articles are included in the review which report on the characteristics of interactions involving hi-tech AAC in a special education setting. One article did not specify the specific educational context of the interactions but was included due to the relatively high number of participants (n=8) using hi-tech AAC in interactions with a teacher. As this small number of studies shows, little is known about interactions involving children who use hi-tech AAC in the special education setting. However, with at least two studies published in the last year (2020), it is a growing area of interest which could inform how to support aided conversations in the special education setting (Savolainen et al., 2020; Tegler et al., 2020).

Table 2.2. provides a summary of the journal articles included in the review. Research findings were synthesised thematically to answer the specific review question (Soilemezi and Linceviciute, 2018) using NVivo12 software.

Table 2.2: a summary of articles included in the review

Authors and date	Title	Type of study	Participant/s using hi-tech AAC	Communication partner/s	Setting
Clarke, M., Soto, G., and Nelson, K. (2017)	Language learning, recasts, and interaction	Sequential analysis based on Conversation	(n= 8) age range 8 - 14 years	Teacher (dyadic interactions)	Not reported

	involving AAC: background and potential for intervention	Analysis (CA) of videoed interactions taken from a wider study of a conversation-based intervention.			
Clarke, M. and Wilkinson, R. (2007)	Interaction between children with cerebral palsy and their peers 1: Organizing and understanding VOCA use	CA of a videoed informal interaction with a peer nominated by the AAC user with no adult present.	(n= 2) age 7 and 10	Naturally-speaking peers also aged 7 and 10 (dyadic interactions)	Mainstream school and Special education setting
Clarke, M. and Wilkinson, R. (2008)	Interaction between children with cerebral palsy and their peers 2: Understanding initiated VOCA mediated turns	CA of a videoed informal interaction with a peer nominated by the AAC user with no adult present.	(n= 2) age 7 and 10	Naturally-speaking peers also aged 7 and 10 (dyadic interactions)	Mainstream school and Special education setting
Clarke, M. and Wilkinson, R. (2009)	The collaborative construction of non-serious episodes of interaction by non-speaking children with cerebral palsy and their peers	CA of a videoed informal interaction with a peer nominated by the AAC user with no adult present.	(n= 2) age 10 and 14	Naturally-speaking peers also aged 10 and 14 (dyadic interactions)	Special education – dining room and therapy room
Norén, N., Svensson, E., Telford, J. (2013)	Participants' Dynamic Orientation to Folder Navigation when Using a VOCA with a Touch Screen in Talk-in-Interaction	CA of everyday interactions.	(n= 1) age 13	Teacher and mother (dyadic interactions)	Special education and home

Savolainen, I., Klippi, A., Tykkyläinen, T. and Launonen, K. (2020)	Linguistic and temporal resources of pre-stored utterances in everyday conversations	CA of videoed interactions highlighting how interlocutors use AAC pre-stored utterances in their everyday interactions.	(n= 4) age range 7 - 18 years	peers and SLT (dyadic interactions)	Special education
Solomon-Rice and Soto (2011)	Co-Construction as a Facilitative Factor in Supporting the Personal Narratives of Children Who Use Augmentative and Alternative Communication	Case study discourse analysis of a videoed interaction during a personal narrative and storytelling intervention.	(n= 1) age 8	SLP/T (dyadic interaction)	Special education classroom in mixed mainstream and special setting
Tegler, H., Demmelmaier, I., Johansson, M. B. and Norén, N. (2020)	Creating a response space in multiparty classroom settings for students using eye-gaze accessed speech-generating devices	Descriptive observational study utilising CA of videoed interactions during an everyday classroom activity.	(n= 2) age 14 and 18	Peers, class teacher, learning support assistant. (multi-party interaction with one AAC user present)	Special education - classroom

2.4.6. Type of studies and analyses

All studies included in this review were single case or case-series studies involving primary and secondary aged children (7 – 18 years) in the special education setting. With only one exception (Solomon-Rice and Soto, 2011) the studies drew on the principles and practices of Conversation Analysis (CA) which is an inductive, rather than deductive, means of coding videoed interactions to identify which aspects of talk or actions the participants themselves treat as communicative resources (Clarke and Wilkinson, 2009). Thus, the researcher does not approach the video data with their own pre-determined codes or categories but uses

next turn proof procedure (Hutchby and Wooffitt, 1998) meaning after one person has spoken, the next person's response will be evidence of how they interpreted the previous speaker's turn (Clarke and Wilkinson, 2007). CA focusses on the talk between real people in their everyday contexts, rather than controlled or contrived experimental conditions (Hutchby and Wooffitt, 1998). The term *everyday* context therefore relates to an environment where naturally-occurring interactions can be video-recorded as they unfold in real-time (Hutchby and Wooffitt, 1998). This is different to video-recordings of laboratory contexts where people are doing an activity or interacting in a way that has been designed by a researcher.

In-keeping with the CA research agenda and procedures, the majority of studies in this review videoed, transcribed and analysed naturally-occurring conversations in their special school context (Jefferson, 1984). That is, within the limits of the current search strategy, the naturally-occurring interactions that children who use hi-tech AAC were involved in within their *everyday* school setting conversing with peers or adult educators (Clarke and Wilkinson, 2007; 2008; 2009; Norén et al., 2013; Savolainen et al., 2020; Tegler et al., 2020). In two studies, video recording occurred during a conversation-based intervention (Solomon-Rice and Soto, 2011; Clarke et al., 2017). However, the studies were included in the review as both studies took place in the everyday setting (school) as opposed to clinical/laboratory environment, and neither study reported a change in the child's performance due to the intervention but focussed on the nature of interaction between the student and the educator; findings which have relevance to this review question.

The small number of participants and qualitative nature of the studies means generalising the findings across all special education settings is not appropriate. Nevertheless, cumulatively, the studies represent 19 different participants² interacting with different communication partners, and across different contexts within the special education setting (see table 2.2). The interactional extracts are illustrative of the co-construction processes that might be observed in interactions involving school-aged children who use hi-tech AAC. By synthesising the findings, some tentative theories regarding the characteristics of aided interactions in the special education setting can be

² not 22 as some participants feature in more than one study

made. For example, why a question-and-answer pattern of interaction may be observed in interactions mediated through hi-tech AAC, and why visible actions and material artefacts, in addition to talk, may be accentuated in interactions involving children who use hi-tech AAC. The characteristics of talk, visible actions and material artefacts in interactions mediated through hi-tech AAC in the special education setting will be explored in detail in the following sections 2.4.7 – 2.4.10.

Another outcome from this literature review was the identification of practical/viable transcription conventions. Excerpts of interactions from the studies in this review have been adapted to use a consistent transcription convention to ensure consistency and clarity, for example, *naturally-spoken utterance* (italicization), “AAC utterance” (italicization and quotation marks) (Higginbotham and Engelke, 2013; von Tetzchner and Basil, 2011). Detailed transcription conventions for this study are outlined in section 4.7.2. of the methodology in table 4.8. Other conventions adopted for consistency include: the term LSA (Learning Support Assistant) is used to describe any classroom assistant/paraeducator, and SLT is used to describe any speech and language therapist or pathologist.

The following sections detail the various characteristics of interactions mediated through hi-tech AAC in the special education setting. These characteristics informed the design of the present study which was undertaken in a special education context.

2.4.7. Talk

Adult and child co-constructed talk

The knowledge and skills of adults in the special education setting who co-construct interactions with children who use hi-tech AAC whilst facilitating their learning was emphasised by four studies in this review (Solomon-Rice and Soto, 2011; Clarke et al., 2017; Savolainen et al., 2020; Tegler et al., 2020). Knowledge and skills were recognised through observations of how adults used their own talk to scaffold the child’s aided utterances through asking questions, recasts, elicitation, and praise. Elements of adult talk will now be discussed with evidence from the studies in this review.

Asking questions

A sequence of questions-and-answers is a predictable pattern of interaction which can facilitate a VOCA mediated turn (Solomon-Rice and Soto, 2011). Indeed, every study in this review involving an adult in conversation with a child has an example of the question-and-answer pattern in their transcriptions even if the pattern is not the focus of their analysis (Norén et al., 2013; Savolainen et al., 2020; Solomon-Rice and Soto, 2010; Soto and Clarke, 2018; Tegler et al., 2020). Solomon-Rice and Soto (2011) conducted a single case study of a SLT and an 8-year-old hi-tech AAC user engaged in a personal narrative intervention. They coded the frequency and percentage of the co-construction strategies used by the SLT and concluded that questioning was used most frequently (36%) (Solomon-Rice and Soto, 2011). Similarly, Clarke *et al* (2017) note that a question-and-answer pattern of interaction was very common across all 8 teacher-pupil interactions in their study. Questions are used by adults to elicit different kinds of information, for example, open-questions elicit more information about a topic whilst closed-questions clarify the meaning of a VOCA utterance:

SLT: “Why were you nervous?” (open-question)

Child: “*My birthday*”

SLT: “Were you nervous because it was your birthday? (closed-question)

Child: ((vocalisation))

(Adapted from Solomon-Rice and Soto, 2011)

Teachers may ask children who use hi-tech AAC a question both to accommodate a VOCA mediated turn and demonstrate their learning regarding the curriculum (Tegler et al., 2020). For example, in Tegler *et al's* (2020) study the teacher was noted to initiate the AAC mediated interaction by calling the student's name and asking her a curriculum-based question, “Anna can you say something about Mercury?” (Tegler et al., 2020, p. 207). Anna had to demonstrate her knowledge of the subject by using the VOCA as visible (non-verbal) actions would not provide an adequate response. The teacher was aware that Anna had access to a pre-stored utterance regarding Mercury (and the other planets) on her VOCA, therefore an open, rather than closed yes/no question, was used to simultaneously elicit knowledge, and prompt a VOCA mediated turn.

Although the question-and-answer pattern typically sees the child who uses hi-tech AAC as a responder, Savolainen and colleagues (2020) note an example of a child and SLT discussing vacations in which the child asks a question: “*what are you going to do on vacation?*” (Savolainen et al., 2020, p. 204). This was a prestored utterance stored under a single button, so the child did not have to build the sentence symbol-by-symbol. The authors argue that prestored utterances assist the fluency of AAC mediated interactions as they decrease the amount of time required to produce an AAC utterance and allow for increased linguistic complexity (Savolainen et al., 2020). In this case, a prestored utterance allowed the child to exert more control over the conversation and initiate a question, rather than take the role of responder. It may be that that question-and-answer patterns of interaction are influenced by how messages are stored in the VOCA, for example, prestored utterances may allow the child to ask rather than respond. Nevertheless, teacher/student interactions may be largely geared towards eliciting information from children who use AAC. Teachers may ask questions, as they would with any child in class, to check the child’s understanding of the curriculum topic, yet they may also ask questions that they know the child can answer, i.e., the answer is available on their VOCA. Subsequently, a question-and-answer pattern of interaction may be observable in interactions involving adult educators and children who use hi-tech AAC in the special education setting.

Elicitation, recasts, and praise

Teachers play an active role in supporting the communication development of children who are learning to become aided communicators. As well as supporting the child’s learning across the curriculum, many educational activities may acknowledge the need to have a specific goal of teaching the child to use their AAC system. Elicitation is a teaching strategy which has been used to scaffold the narratives of typically-developing school aged children and can similarly be used with children who use hi-tech AAC (Clarke et al., 2017; Solomon-Rice and Soto, 2011). In Solomon-Rice and Soto’s (2011) study, elicitation made up 5% of the total scaffolding practices used by the SLT. As a means of eliciting further information, for example “tell me about who came to your party” or to prompt the use of the child’s VOCA directly, “tell me with your Vantage™” (Solomon-Rice and Soto, 2011, p. 75). Educator’s use of scaffolding practices in their co-constructed talk with school-aged children who use hi-

tech AAC has both similarities and differences to the types of scaffolding that might be expected between educators and typically developing children. Clarke and colleagues' (2017) study used qualitative sequential analysis (based on CA) to analyse extracts of dyadic conversations between teachers and child AAC users aged 8 -14 (n=8). They found that teachers recast the child's AAC utterances in a variety of ways including: expanding the child's utterance, using interrogatives, declaratives, and clarifying potential meaning (Clarke et al., 2017). They found that children who use hi-tech AAC, like typically-developing children, treat these recasts not just as prompts to repair their previous utterances, but also as requests for clarification of meaning (Clarke et al., 2017; Clarke, 2016). Therefore, children who use hi-tech AAC may respond using another AAC utterance, or through non-verbal means, for example, nodding/shaking head to confirm or deny. Also of note is educators' use of praise specific to the child's use of aided language, for example "this is a great sentence" (Clarke et al., 2017, p. 47) and knowledge of the VOCA, "you knew exactly where to find it [the word]" (Solomon-Rice and Soto, 2011, p. 76); teaching staff seek to positively reinforce attempts at expression via an AAC system, which may not appear in conversations between teachers and typically-developing 8–14-year-olds. Overt references to the use of language via an AAC system and specific strategies such as elicitation, recasting, and praise may be evident in the interactions between teaching staff and children who use AAC, as 'teaching' also includes the acquisition and use of language through an AAC system.

[Child-led and adult-led co-construction strategies](#)

Solomon-Rice and Soto (2011) argue that there is a difference between child-led and adult-led co-construction strategies used by educators. For example, child-centred strategies may involve watching the child's attempts to communicate, allowing sufficient time for them to respond, giving positive praise, and asking open-questions (Solomon-Rice and Soto, 2010; Soto and Clarke, 2017). Conversely, adult-led strategies may involve leading the topic of conversation (Norén et al., 2013), correcting or drilling AAC utterances, and asking predominantly closed-questions (Tegler et al., 2020). However, levels of adult control may also be related to the type of task the interlocutors are engaged in. Both Solomon-Rice and Soto (2011) and Soto and Clarke (2017) aimed to support children's personal narrative skills,

thus the task involved talking about an event that was important to the child. It may be that child-centred co-construction strategies are easier to apply if the goal of the task is to hear more about the child's life. Conversely, curriculum-centred tasks may foster adult-led co-construction strategies as the adult wants the child to demonstrate their knowledge of pre-determined topics rather than a topic of the child's choosing (Norén et al., 2013; Tegler et al., 2020). Tentatively, personal narrative tasks may be facilitative of child-led co-construction in aided interactions. However, currently this is speculative as few studies into AAC interactions in the special education setting demarcate child-led from adult-led co-construction strategies. Further research into the nature of child-led co-construction processes in a special education setting is required.

Children's co-constructed talk

To date, there are no reported peer reviewed studies of children who use hi-tech AAC talking in a classroom or small group with peers in the special school setting. Tegler *et al's* (2020) study focusses on a teacher-led class discussion which involves peers, yet of note; the children do not speak to each other directly. The few dyadic studies of children interacting in a special education setting are included in this review and offer insight into how children's peer talk may unfold if they are left alone to chat together (Clarke and Wilkinson, 2007; 2008; 2009).

Clarke and Wilkinson's (2008) study describes how naturally-speaking peers might interpret VOCA mediated turns. As previously discussed, (2.2.5.) constructing an utterance on a VOCA is time consuming, meaning that VOCA turns are frequently single-word utterances:

Tina (AAC user): ((32 seconds pass as Tina operates her VOCA)) "*picture*"

Lucy: "picture"

Tina: ((nods))

Lucy: "you coloured in a picture"

(Adapted from Clarke and Wilkinson, 2008)

Lucy must interpret Tina's VOCA utterance which lacks grammar and specificity (Clarke, 2016). This is achieved by both girls via a process of repeating (Lucy), confirming (Tina), and extending (Lucy) the VOCA utterance. This is typical of co-construction processes in aided interactions: the naturally-speaking partner interprets and translates the VOCA utterance

and provides a gloss through a naturally-spoken utterance (von Tetzchner, 2018). For Lucy and Tina, fluent co-construction is possible because of their familiarity with each other which allows Lucy to interpret her friend's visible actions and single-word utterances correctly. However, even familiar peers are not always successful, and Clarke and Wilkinson (2008) offer a further example of Lucy misunderstanding Tina. In this case, Tina's use of the word "*greens*" is misinterpreted as an adjective (colours) rather than a noun (vegetables). Even familiar peers can misunderstand the communicative intentions of children who use hi-tech AAC. This may be further confounded if the child's peer has CCN themselves, which may be expected in a special education setting. Notably, the naturally-speaking peers in Clarke and Wilkinson's studies (2007; 2008; 2009) are described as having a mild learning disability, age-appropriate comprehension skills, and mildly affected speech abilities (Clarke and Wilkinson, 2009). Other children in the special education may have a diverse range of CCN and could find it difficult to interpret the nuanced actions and single-word utterances of peers who use hi-tech AAC, though this is purely speculative. From the current research, it is not clear how peers with CCN might interpret the actions and talk of children who use hi-tech AAC. In the special education setting, co-constructed peer interactions might involve children with diverse communication needs, including the use of AAC, and further research in this area is warranted.

Children and adults together (multi-party interactions)

One study in this review described two multi-party interactions, i.e., two examples of a child using hi-tech AAC in a classroom environment with a teacher, LSA, and peers with diverse communication and learning needs (Tegler et al., 2020). Although this is only one study, it is important as children in the special education setting may experience this type of whole-class interaction frequently throughout the school day. Tegler and colleagues (2020) emphasise that both the teacher and LSA actively defended the space for the hi-tech AAC user to contribute to the class discussion through "side-sequences" (Tegler et al., 2020, p. 209) of interaction with classmates who were interrupting. For example, by asking peers to wait whilst an AAC utterance was under construction:

Teacher: ((looking at peer)) "we will wait we will wait"

Peer: ((thumbs up))

Teacher: "maybe Steve can answer"

LSA: “what is that?”
Steve (AAC user): “*foot*”
(adapted from Tegler et al., 2020)

This example reveals how adults and children might collaborate to accommodate a VOCA mediated turn in the whole-class environment. It suggests that side-sequences of interaction may be required to ensure children who use hi-tech AAC can contribute to wider-discussions yet as the only study of its kind further research multi-party interactions is required to explore side-sequences further.

2.4.8. Visible actions

Children who use hi-tech AAC do not always use their VOCA in their interactions, relying instead on embodied visible actions such as gesture and facial expressions. Clarke and Wilkinson’s (2009) study highlighted that the VOCA is not always used by children who use hi-tech AAC in their conversations with peers. For example, the speaking peer may ask yes/no questions, then interpret and ‘voice’ their friends visible actions in response (Clarke and Wilkinson, 2009). In these instances, the child who uses hi-tech AAC need only indicate acceptance or rejection of the communication partner’s question and/or interpretation of their actions. Confirming or rejecting the communication partner’s interpretation of their vocalisations, non-verbal communication, or aided-utterances can be achieved quickly through visible actions such as a nod, smile or frown and are noted across interactions with both adults and peers in this review (Clarke and Wilkinson, 2009; Solomon-Rice and Soto, 2011; Savolainen et al., 2020). Visible actions may enhance the speed and efficiency of the interaction when compared with VOCA mediated turns. For example, Clarke and Wilkinson (2009) present a fluent example of peers having a playful and even risqué conversation when the VOCA is not used and the naturally speaking child provides the words for their peer’s preceding actions:

Martin (AAC user): ((eye gaze flicks down and back up to look at David))
((Martin and David look at each other))
David: “has she asked me out recently?”
Martin: ((smiles at David))
David: “well not exactly but we’re getting along” ((leans towards and looks at Martin))
(Adapted from Clarke and Wilkinson, 2009)

In the context of their conversation about a member of teaching staff, David interprets Martin's searching look up and down and their shared gaze as a question. David gives voice to Martin's questioning look, "has she asked me out recently?" and Martin aligns with and confirms David's interpretation by smiling. Here, all of the 'talk' is provided by the communication partner, yet Martin is active in co-constructing the conversation through his use of visible actions. The opportunity for Martin to be active in this interaction is perhaps facilitated by his friendship and bond with David who knows him well enough to interpret a fleeting glance and held mutual gaze.

Although visible actions can mitigate the need to use the VOCA at all, they are also important for maintaining and terminating a VOCA mediated turn in a conversation (Savolainen et al., 2020). For example, the child who uses hi-tech AAC may use gaze to look from the VOCA to the communication partner to indicate that they have completed their VOCA mediated turn, or indeed hold their gaze to the VOCA to indicate they have not yet finished their utterance-under-construction (Tegler et al., 2020). Similarly, a child may look at and point to symbols on their VOCA screen as they search for the vocabulary they need, indicating to the communication partner that there is an AAC utterance-under-construction (Norén et al., 2013). The child's actions in relation to the VOCA screen are visible to the communication partner potentially indicating that they should wait for the aided speaker's turn.

2.4.9. Material artefacts

VOCAs

A hi-tech AAC device is not just a source of audible voice output. It is a visible material artefact in the interactional context which could be used by anyone as a resource for establishing meaning (Norén et al., 2013). As part of their studies into the interactions of children who use hi-tech AAC and their naturally-speaking peers, Clarke and colleagues left the children alone in a room without the researcher and recorded their spontaneous interactions (Clarke and Wilkinson, 2007; 2008; 2009). In all cases, both the AAC user and the naturally-speaking peer spontaneously positioned themselves so they could see the VOCA. This meant the peer could indicate when the VOCA might be relevant to the ongoing

conversation, for example, by nodding towards the device whilst asking a question to indicate that the answer may be expressed through the VOCA (Clarke and Wilkinson, 2007). Clarke and Wilkinson (2007) argue this shows that both partners shared responsibility for the VOCAs use. However, it also highlights a perhaps unique facet of aided communication, whereby the device itself is orientated to and accommodated within the interaction by *both* interlocutors, as if it were another person in the room waiting for a turn to talk.

Noren *et al's* (2013) study of a dyadic interaction between a child and his teacher and Tegler *et al's* (2020) multi-party classroom interaction, describe how shared orientation to a child's VOCA screen can be utilised by teaching staff in the classroom setting. For example, when asked a question about the closest planet to the sun the child uses her VOCA but gives an incorrect answer, "*Mars is a terrestrial planet*" (Tegler et al., 2020, p. 208). The teacher then positions himself behind the child so he can see the VOCA screen, points at the symbol MERCURY and whispers "Up there, there" (Tegler et al., 2020, p. 208). Here, the visible nature of the VOCA display allows the teacher to scaffold and assist the child to find the correct answer through gesture (towards the VOCA) and whispered speech. Conversely, Norén *et al* (2013) caution that whilst shared orientation to a VOCA screen gives the communication partner a chance to collaboratively assist, it also leaves the child's utterances vulnerable to interference. The child in their case study attempts to talk to his teacher about his likes and preferences - his favourite movie, which is evident through his selection of folders: SPEAK – FAVOURITE MOVIE – "*my favourite movie is*" (Norén et al., 2013, p. 30). However, his teacher interrupts and changes topic despite seeing the child's intention to talk about films. Therefore, the VOCA as a shared material artefact leaves the progression of the conversation open to the dominant intentions of the naturally-speaking communication partner.

The VOCA is a physical, material artefact making it potentially accessible to anyone in the interaction. Therefore naturally-speaking communication partners in the special education setting may use the VOCA to mediate their interactions with the child AAC user, that is, not just as a voice output machine but in ways not intended by its original design (Pullin et al., 2017). Previous research has shown that naturally-speaking peers and teaching staff in the special education setting have done this in different ways (Clarke and Wilkinson, 2007; Norén et al., 2013; Tegler et al., 2020). Firstly, through broad gesture (nodding)

towards the device to indicate a VOCA turn could come next, and secondly through specific gesture (pointing) to symbols on the device screen to shape the AAC utterance-under-construction. Although these are a limited number of examples, together they raise an important consideration for children who use hi-tech AAC in the special education setting: do naturally-speaking conversation partners utilise the physical and visible nature of the VOCA to scaffold and collaborate with the AAC user's intentions, or direct and intervene with their own agenda?

Other material artefacts

Although the use of artefacts (other than the VOCA) in the environment was not the focus of any study in this review, three studies detail material artefacts in their analysis: worksheets (Tegler et al., 2020), photographs (Solomon-Rice and Soto, 2011; Clarke et al., 2017), a story grammar map and paper/easel (Solomon-Rice and Soto, 2011). In Tegler *et al's* (2020) classroom based study the teacher is stood at the front of the class and asks the child, Steve, a question whilst pointing to the HAND symbol on a worksheet, "Steve what's in the last picture?" (Tegler et al., 2020, p. 207). The use of the worksheet paired with a closed-question could have scaffolded Steve's timely contribution to the classroom discussion on anatomy. There is only one possible answer which makes a single-word utterance "hand" appropriate thereby mitigating the need for Steve to produce a time-consuming, complex utterance. However, Steve did not have HAND available on his device and a protracted sequence of interaction ensues as the LSA supports Steve to find another means of expressing hand (Tegler et al., 2020). In this case, the use of an additional material artefact in the form of a worksheet did not facilitate Steve's contribution to the classroom discussion as intended.

Conversely, photographs were used to good effect in the two studies that described interactions within a conversation-based and personal narrative intervention (Solomon-Rice and Soto, 2010; Clarke et al., 2017). Neither study explicitly focusses on the use of material artefacts, as previously discussed (2.4.7.) both aim to summarise the positive verbal scaffolding strategies employed by the teacher or SLT (Solomon-Rice and Soto, 2011; Clarke et al., 2017). Nevertheless, revisiting the transcriptions reveals the contribution of material artefacts in both studies. The use of photographs from personal events in the child's own

life is one activity used to promote the personal narrative skills of the child, though the results of the specific interventions are published elsewhere (see for example, Soto and Clarke, 2018; Soto et al., 2008). Contrary to the worksheet example in Tegler and colleagues' (2020) study, personal photographs provided a context for open-ended, rather than closed, questions which necessitate elaborated answers:

Teacher: "So tell me about this picture what happen that day? What's happening?"

Child: "*I to go my house cousin Alex Aby*"

(Adapted from Clarke et al, 2017)

Furthermore, if the child's linguistic skills were not sufficient to produce multi-symbol utterances, photographs supported the adult to elicit a range of other information from the child, such as how they felt or who was there:

SLT: "How were you feeling that day?"

Child: "*Nervous*"

SLT: "Who is the story all about?" ((pointing to Vantage™))

Child: "*me*"

SLT: "Okay, me." ((writing on easel)) "Anybody else? Who's that?" ((pointing on photo))

Child: "*Mom*"

(Adapted from Solomon-Rice and Soto, 2011)

As shown in the extract above, in Solomon-Rice and Soto's (2011) study, the SLT used other material resources in addition to the photograph to facilitate the child's personal storytelling including pointing to the VOCA, and writing down everything the child said on a large piece of paper/easel. The written record was visible to both the adult and the child and allowed them to review the child's narrative together. The authors note that co-constructing a detailed personal narrative through hi-tech AAC can take a long time (in this case 46 minutes) meaning the written record also served as a memory aid as the elements of narrative emerged (Solomon-Rice and Soto, 2011).

The use of material resources and artefacts external to the VOCA may be expected in interactions involving children who use hi-tech AAC in the special school setting. Educational resources such as worksheets could arguably be used in any subject. They may be used as a general teaching tool for the whole class, or to prompt a VOCA mediated utterance, though as this review has shown, problems can arise if the child does not have the relevant

vocabulary on their device. Similarly to findings of the participatory methods review (2.3.10.), personal photographs may help children who use hi-tech AAC to tell personal stories and talk about their experiences and views. However, examples of using photographs to support personal narratives are from conversation-based interventions rather than everyday interactions and it is not clear if photographs are routinely used to support AAC interactions in the special education setting.

2.4.10. Summary of interactions mediated through hi-tech AAC in the special education setting

Co-construction processes in the interactions mediated through hi-tech AAC rely heavily on naturally-speaking communication partners. However, much of the evidence is taken from dyadic interactions with studies on multi-party interactions just beginning to emerge. Through synthesising the evidence to date, it is clear that interactions mediated through AAC in the special education setting are complex. They involve the interplay between people's embodied communicative resources (naturally-spoken talk, vocalisations, and visible actions), external resources (worksheets, pen and paper, photographs) and the VOCA which as well as providing aided-talk, is a visible external artefact which could be utilised by anyone in the interaction. Furthermore, the nature of interactions may differ depending on the role of the communication partner and the activity that the interlocutors are engaged in. Peer interactions may be non-serious and social. However, interactions with adults are likely to be influenced by the teaching agenda and the task at hand. It may be, that curriculum-based activities foster adult-led co-construction processes as educators want children to demonstrate their knowledge of the pre-defined topic and/or use their VOCA. Tentatively, personal narrative tasks may foster child-led co-construction processes. Similarly to a participatory researcher, the adult educator is aiming to support the child to tell their personal story which will include their own experiences and views. However, further research is needed to explore what child-led co-construction might look like in interactions mediated through hi-tech AAC in the special education setting.

2.5. Synthesising the participatory and interaction literature

A specific, child-led group approach to hearing the views and experiences of children who use hi-tech AAC in the special education setting does not currently exist. However, theories for how this may be achieved can be drawn from two fields of research: participatory research with children who use hi-tech AAC and AAC interaction research in the everyday special education setting. The participatory research literature highlights *co-creative* methods and strategies with the potential to support children who use hi-tech AAC to express their experiences and views, for example: child participant's photographs, symbol-based rating scales. Participatory research emphasises the macro detail of this process, that is, the extended periods of time and multiple encounters required for children who use hi-tech AAC to explore and express their views. Conversely, a review of AAC interaction research highlights the micro-detail of *co-construction* processes which may support children who use hi-tech AAC to express their views second-by-second, for example, leaving time to respond, asking open-questions, and using positive praise.

In interactions mediated through AAC, all communication partners have important contributions to make so that the child who uses hi-tech AAC can express their views. The idea that familiar adults can assist children in expressing their views is somewhat at odds with the participatory research agenda which states that it is imperative to move away from adult proxies. However, for children who use hi-tech AAC, the presence of familiar adults may be essential for hearing their views. Reflecting on this tension and consideration of how to achieve child-led rather than adult-led interactions could be integral to hearing the views of children who use hi-tech AAC.

This review of the literature led to the planning and delivery of a pilot study to ascertain if children who use hi-tech AAC (and their peers with CCN) could engage with a child-led approach to hearing their views. The pilot study centred around co-creating children's personal storybooks (a multi-modal artefact detailing a personal narrative). The pilot was used to refine the methodology and methods used in the main study and will be described in the following chapter. The main study aimed to explore the processes involved in taking a child-led and participatory approach to hearing the views of children who use hi-tech AAC and their peers in a special education setting. This literature review led to the following research questions (2.6). Initially, these questions were speculative and required a

pilot probe. Although the final main study questions emerged later through revisiting the literature considering the pilot study findings, they are presented here to support the reader's comprehension of what emerged and what follows.

2.6. Research questions

2.6.1. Pilot study:

How do children who use hi-tech AAC and their peers with CCN engage with a PAR approach to recording information, forming ideas, and exchanging information?

2.6.2. Main study:

1. In the process of personal storybook *co-creation* (over six weeks) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?
2. In the process of message *co-construction* (in seconds) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?
3. What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use hi-tech AAC and their peers?
4. Is co-creating children's personal storybooks a viable way of working with children who use hi-tech AAC in the special education setting?

3.0. Chapter 3: Pilot study

3.1. Introduction

This chapter will present the pilot study's research question, methods, results, and discussion in full. The pilot study findings led me to revisit the literature detailed in the previous chapter as a means of evaluating the pilot. This process was integral to refining the main study's aims and finalising the four related research questions. Consequently, the main study's aims and associated research questions will be presented again at the end of this chapter.

3.2. Pilot study research objective

To explore if children who use hi-tech AAC (and their peers with CCN) could engage with a child-led approach to hearing their views. I named this approach AACtion Heroes.

3.3. AACtion Heroes: hearing every child

I designed AACtion Heroes to be a child-led, group approach for use in the everyday special education setting. In addition to hi-tech AAC users, children in a special education setting who have CCN may use other modes of AAC, for example, speech supported sign (no-tech) or paper-based AAC systems (low-tech). It was important that all participating children could engage with the AACtion Heroes approach and have their views heard. Therefore, although exploring ways of hearing the views of children who use hi-tech AAC remained central to the overall research project, the pilot study aimed to explore how children who use any mode of AAC could engage with AACtion Heroes. This would ensure that the focus of AACtion Heroes was on hearing the views of every child with CCN who participated. The pilot study research question was reworded to reflect the focus on children who use any mode of AAC (3.3).

3.3. Pilot study research question

How do children who use AAC engage with the AACtion Heroes approach to recording information, forming ideas, and exchanging information?

3.4. Pilot study procedures

3.4.1. Pilot study philosophical underpinnings

The pilot study was a qualitative and exploratory project underpinned by a participatory theoretical framework (see figure 3.1.). A detailed discussion of the ontological, epistemological, and theoretical framework underpinning this research (pilot and main study) is presented in the following methodology chapter (4.3.1).

The pilot study was not solely a PAR project involving children who use AAC. Rather, it aimed to explore *how* children who use AAC engaged with an adapted PAR methodology and methods. Therefore, it was important to analyse how children were able to express their views, rather than the content of the views themselves. Latent thematic analysis aims to theorise the sociocultural conditions which enable participant's accounts (Braun and Clarke, 2006). It was therefore a suitable data analysis method for answering the pilot study research question.

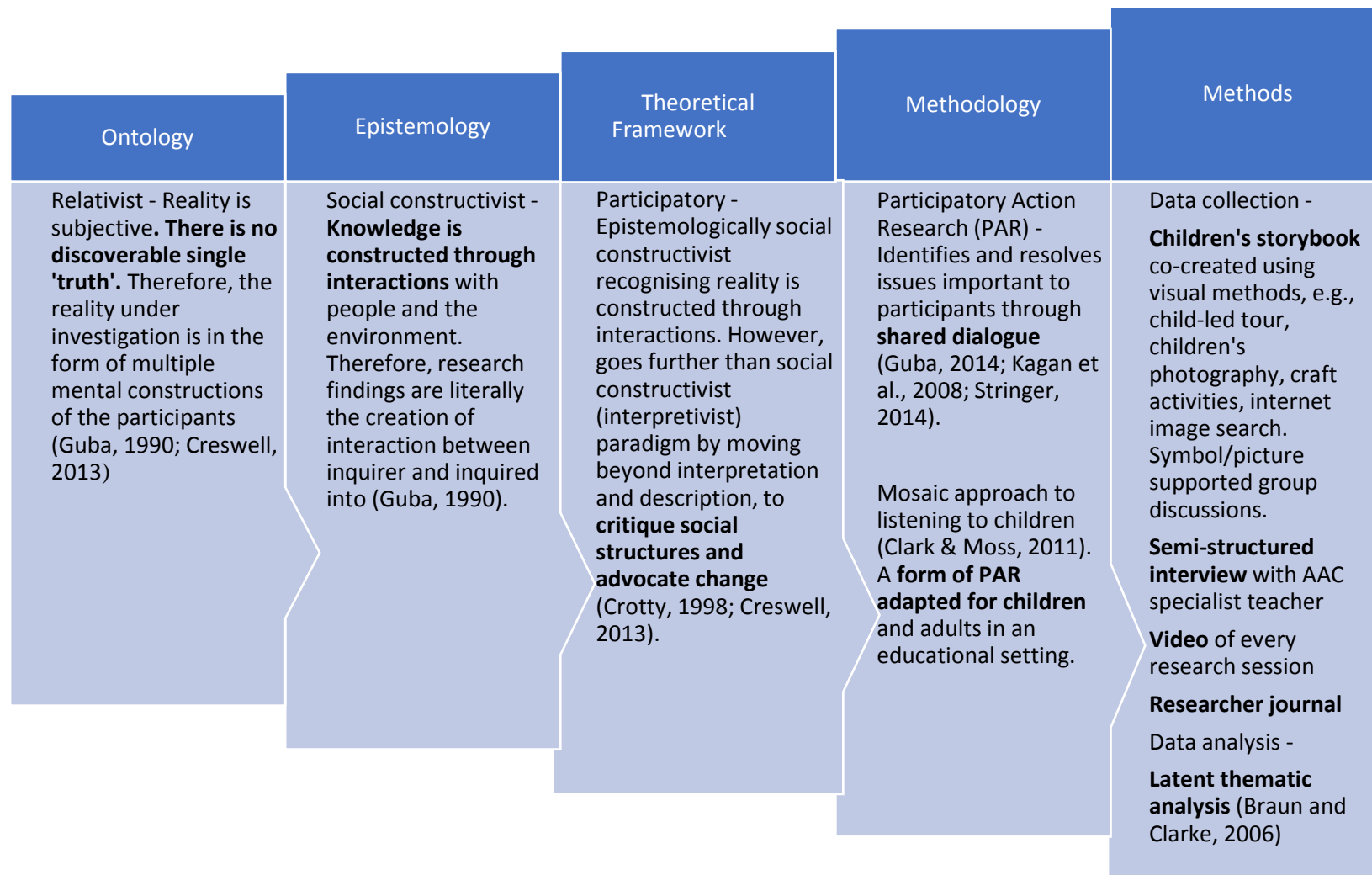


Figure 3.1: Philosophical underpinnings of the pilot study

3.4.2. Ethical approval

Ethical approval was gained from Manchester Metropolitan University's Research Ethics committee (Appendix A). The study involved children with CCN, therefore the Ethics committee required the following information:

- explanation and evidence of how children would be recruited via gatekeepers (Appendix B)
- the process and documentation for gaining parental consent (Appendix C)
- to increase accessibility of study information, symbol supported documents explaining the project (Appendix D)

Part of the approval process detailed the inclusion of ongoing observations of the children's assent or dissent to take part in research activities as well as consideration of how both the child and adult participants would be protected from risks and hazards including emotional distress.

3.4.3. Inclusion/Exclusion criteria

I recruited school-aged participants at primary-school stage - aged between 7;0 (years;months) and 12;11 from the same class, who used a low or hi-tech AAC system with an expressive vocabulary of at least 20 words. A minimum of one child in the group must have used a hi-tech AAC system for a minimum of 24 months. Adult participants were recruited if they regularly supported the children in the classroom.

3.4.4. Recruitment and consent procedures

Child participants were recruited via gatekeepers at a special education school for pupils aged 4 to 19. Informed parental consent was obtained prior to commencing the study. Children provided assent (Appendix D). Their ongoing assent for participating in the research activities was continually monitored throughout the study. No one withdrew their assent from the pilot study at any point. Adult participants were recruited via gatekeepers who approached learning support assistants (LSAs) who were highly familiar with the children. The study was explained to each adult participant and consent was obtained prior to commencing the study (Appendix E).

3.4.5. Pre-AAcTion Hero's information gathering

Once participants had been identified and ahead of the main pilot activity, I planned to undertake classroom observations of the children to ascertain their communication styles and physical and sensory support needs. I also planned to discuss the children's support needs with their classroom teacher and participating LSAs to ensure that the research sessions format and materials would support them as best as could be predicted. I would take this opportunity to emphasise the ethical differences between (compulsory) school-based activities and (optional) research activities with all adult participants before commencing the project. That is, I would ask adults not to persuade or force the children to engage in research activities as they might do with traditional class-based tasks.

3.4.6. Pilot study design: AAcTion Heroes

Participants were asked to engage in 6 group sessions, over a 6-week period, with each session lasting approximately 1 hour. The structure of the pilot study would mirror Clark and Moss's (2011) three stage Mosaic Approach in which children and adults gather information together, piece it together through dialogue and reflection, then decide on changes to ensure the link between listening and action is emphasised (Clark and Moss, 2011; Clark, 2017). In this study, the three stages were conceptualised as 'look- think -act' and supported with symbols. Figure 3.2. shows which research activities corresponded to the three stages of 'look – think - act' in the pilot study.

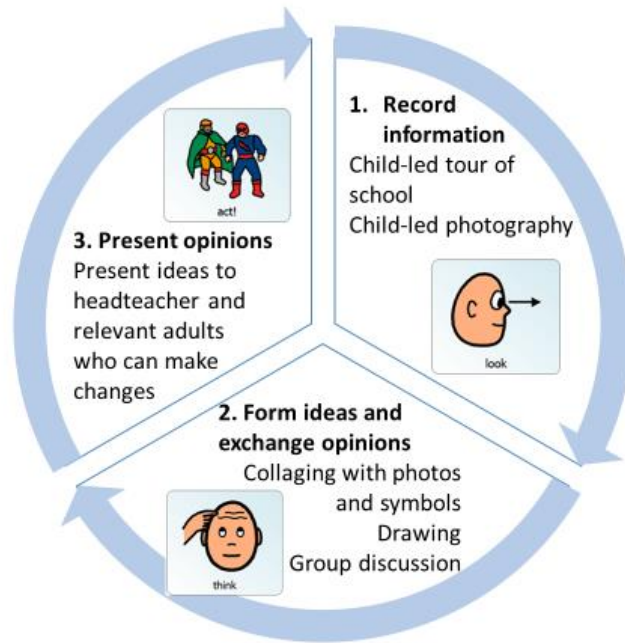


Figure 3.2: Three stage 'look – think – act' pilot study methodology

In sessions 1 and 2, ('look') the aim was for children to take photographs of things that are meaningful to them, using a school iPad or using their existing hi-tech AAC device. At the start of the session, they were also given the AAction Heroes research kit; a selection of items designed to foster children's ownership of the research (Ajodhia-Andrews, 2016; Wickenden and Kembhavi-Tam, 2014). Figure 3.3. shows the AAction Heroes research kit designed to be given to each participant comprising an action hero cape, pencil and pencil grip, action hero notebook, low-tech AAC symbol cards, and a photo ID badge.



Figure 3.3: Research kit

In session 3 and 4, ('think') the aim was for children and adults to explore ideas and express opinions together about the photographs taken in sessions 1 and 2. Child and adult participants developed child's 'storybooks', which included the photos taken in sessions 1 and 2 and used symbol strips to describe the pictures and how they felt about them. These were collated into a PowerPoint/storybook format by the researcher, and child and adult participants given the opportunity to confirm or change any information. In session 5 and 6 ('act'), participants developed a presentation of their work – including the description, images and a video message from each child. This included what they had been doing in the research sessions, their perspectives on the school and any ideas for change and a video message, that was presented to staff and other students in the school.

Tables 3.1., 3.2. and 3.3. below describe the aims, methods, materials, data recorded and evaluation of research activities at the three stages of the pilot study methodology.

Table 3.1: Stage 1 – ‘look’ - record information

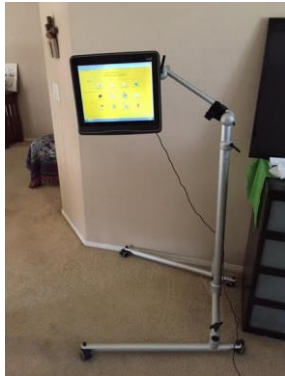
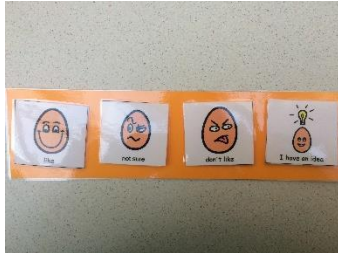

Activity	Aim	Methods	Materials	Data collection	Evaluation
<p>Child-led photography</p> <p>Photographs are a visual means of collecting data and will provide a focus for child-led topics for discussion in stage two.</p>	<p>LOOK - For children to take photographs of things that are meaningful to them.</p>	<p>Each child was provided with a school iPad or used their existing hi-tech AAC device to take photographs. Children were given verbal reminders of the task supported with the symbol strips from the research kit (see figure 3.3.), e.g., “you can take a photo of something you like, don’t like, you’re not sure about, or you have an idea about”.</p> <p>For example, Joanne was facilitated by a familiar adult who moved her device around on a stand until the camera was pointed at something she was interested in. The adult asked yes/no questions, e.g., “Is this right? Shall I move it left a little bit?” etc. Joanne smiled when the picture was correct and then gazed at a button on the screen to take the photograph.</p>	<ul style="list-style-type: none"> 2 x iPads Children’s own hi-tech AAC systems (e.g., eye-gaze device on wheeled stand)  <ul style="list-style-type: none"> Low-tech symbol strips  <ul style="list-style-type: none"> Video camera 	<p>Video footage of session detailing interactions and independent activities.</p> <p>My observations and reflections recorded in journal after each session.</p>	<p>It was unclear if the children were taking photographs of things they like/don’t like etc, or if they just enjoyed taking photographs. Some images were blurred and it was unclear if they were taken by accident or were of something meaningful. Further exploration of this was needed through discussing the children’s images with them.</p> <p>PLAN: print out each child’s photographs for review next session. Include any blurred images as these may be important to the child.</p>

Table 3.2: Stage 2 – ‘think’ - form ideas and exchange opinions

Activity	Aim	Methods	Materials	Data recorded	Evaluation
<p>Picture description</p> <p>Pictures are a visual artefact to support children with CCN to set the topic of discussion</p>	<p>THINK - For children and adults to explore ideas and express opinions together about a child-led topic.</p>	<p>Child and adult participants built child ‘storybooks’: they described their pictures using symbol strips in the research kit or their existing AAC systems. Sentence completion tasks supported with a choice of symbol adjectives expanded this further, e.g., I like the library because it is X. Child participants used their own AAC systems or adjective symbol-cards provided to fill-in the blanks. Adult participants also used the symbol-cards and assisted children to find vocabulary on their own systems when needed.</p>	<ul style="list-style-type: none"> • Velcro symbol cards • Choice board • E-Tran frame (perspex frame used so Joanne could eye-point to vocabulary)  <ul style="list-style-type: none"> • Video camera <p>Added mid-session</p> <ul style="list-style-type: none"> • Felt pens • Glue sticks • Adapted scissors • Blue tack 	<p>Video footage of session detailing how adults and children interacted together.</p> <p>Researcher observations and reflections recorded in journal post-session.</p> <p>Photographs of the participants’ final picture (originals given back to children)</p>	<p>Children spontaneously tried to stick symbol cards onto the printed photographs which a digital screen would not have allowed. One child asked if she could draw on her pictures, so an adult got some felt-tips. Adults also drew pictures and stuck on symbols whilst talking with the children. Adult participation in the task allowed them to support the children to express their ideas but felt more relaxed than if they were watching (i.e., not participating) and supporting the children.</p> <p>PLAN: Provide a range of hi and low-tech materials and structure the environment in the main study so that everyone has a seat around the table for a creative task. This facilitates a conversational tone rather than ‘question and answer’ style activity.</p>

<p>Researcher-led reflection and interpretation</p>	<p>To provide a weekly opportunity for all adult and child participants to confirm or change the researcher's interpretation of their messages.</p>	<p>I collated children's pictures and/or videos into a PowerPoint presentation and reviewed it with them at the beginning of the next session. The presentation was also printed in storybook form, so that the children could look through their work every week. Adult and child participants could then comment on the pictures and had an opportunity to confirm or change any information.</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Print outs of presentation • Audio/visual equipment 	<p>My observations and reflections recorded in journal post session.</p>	<p>Children enjoyed looking at their work, so weekly reflection provided a positive start to each session.</p> <p>PLAN: continue to reflect and interpret weekly in a storybook format (electronic and hard-copy) in the main study.</p>
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Table 3.3: Stage 3 – ‘act’ - presenting opinions

Activity	Aim	Methods	Materials	Data recorded	Evaluation
Final presentation	ACT - To ensure that people who could effect change heard the children’s views. To emphasise the link between listening to children and taking action.	The children invited their classmates and various members of teaching and therapy staff from around the school. They attended the presentation in the library, as per the children’s request. The presentation included a description/images of the children’s work and a video message from each child. The head-teacher then spoke to each child about their request/comment and told them what he planned to do next.	<ul style="list-style-type: none"> • PowerPoint presentation • Audio/visual equipment 	Researcher reflections in journal post session which included details of the headteacher’s response.	<p>Getting feedback directly from the head-teacher was largely a new experience for the children and perhaps more emotional for them than I had previously considered. It was important for the children to hear how their views would be acted on. They appeared to understand the practical measures that would be taken.</p> <p>PLAN: Presenting ideas to the head-teacher should be an integral element of the main study.</p>

3.4.7. Pilot study participants

Four children meeting the inclusion criteria were recruited from the same class (see table 3.4. for description of child participants). This included two hi-tech AAC users and two users of low-tech AAC. An AAC specialist teacher and two LSAs from the children’s class participated in each research session with the children. The AAC specialist teacher also took part in a semi-structured interview when the research sessions were completed to reflect on the approach. In-keeping with the PAR agenda, I was a researcher-practitioner (Baum et al., 2006) who both facilitated and engaged with the participants and the research activities.

Table 3.4: Child participants

Participant* Pseudonym	Age	Medical Diagnosis	Expressive communication, including AAC system	Mobility
Daisy	8;4	Global Developmental Delay, ADHD, Epilepsy.	Spoken single words/short sentences. Points to symbols. Natural gesture. Occasional Makaton ** user.	Ambulant
Joanne	10;0	Quadriplegic Cerebral Palsy, Developmental delay, Visual Impairment (wears glasses).	Facial expressions. Eye-points to communication board with low-tech symbols. Hi-tech AAC systems: Eye-gaze access to communication aid on stand with Grid Player 3 (6x3 grid) and predictive text. iPhone fixed to chair with photos and music (requires adult assistance to access with left hand).	Electric wheelchair user (adult propelled)
Holly	8;6	Global Developmental Delay, Learning Disability.	Makaton. Natural gesture and facial expressions. Single word approximations. Points to symbols if prompted.	Ambulant
Adele	10;9	Rare genetic condition, Global Developmental Delay, moderate bilateral hearing loss.	Makaton. Facial expressions. Humming with intonation. Hi-tech AAC system: Liberator 7 with Chatpower 48 vocabulary.	Walks with assistance Manual wheelchair user (adult propelled)

*All participants identified by the gatekeeper (AAC teacher) were female, but this was a coincidence and was not a requirement of the study.

**Makaton is a speech supporting signing system in which key words are signed alongside spoken words.

3.4.8. Pilot study data collection methods and types of data

The pilot study elicited various kinds of data for analysis. The children's storybooks which included their photographs or other creative images; video recordings of every session (6 hours of video); transcripts and recordings of the semi-structured interview with the specialist AAC teacher at the end of the study which was recorded and transcribed (see appendix F for interview schedule); and my own observational and reflective journal which documented the 6-week process from my perspective.

3.4.9. Pilot study data analysis

Latent thematic analysis (Braun and Clarke, 1996) of all these data was conducted using Thematic Networks Analysis (TNA) described by Attride-Stirling (2001). I began by exploring the adult data and my own reflective journal. I then reviewed the video data related to the child's responses, and also considered the material artefacts they produced during the sessions. Analysis commenced by line numbering the interview transcript and reflective journal and coding each segment of text. As outlined by Attride-Stirling (2001), this was followed by extensive memo-ing and iterative coding of basic themes. I then repeatedly watched the video footage. I transcribed excerpts of video using notation for AAC interactions (Higginbotham and Engelke, 2013; Von Tetzchner and Basil, 2011). Basic themes from the interview and journal analysis were expanded and collapsed based on the emerging video data. Further reviewing of the journal, interview, children's personal storybooks, and video data was required to ensure the basic themes were representative of the data before identifying organizing and global themes (Attride-Stirling, 2001). The results are described below using Thematic Networks (Attride-Stirling, 2001).

3.5. Presentation and discussion of pilot study findings

Analysis revealed four areas that impacted the children's ability to record information, form ideas and express opinions (global themes): school environment, people's interaction style,

resources, and participatory philosophy (see figure 3.4.). The organizing themes encompassed both barriers and facilitating factors to the children’s engagement in the AAction Heroes approach. Whilst thematic analyses identified the themes occurring throughout the data, thematic networks visually illustrate the themes (Attride-Stirling, 2001). Each thematic network will be depicted and discussed below, with examples from the pilot study, to provide evidence of their importance in informing the main study.

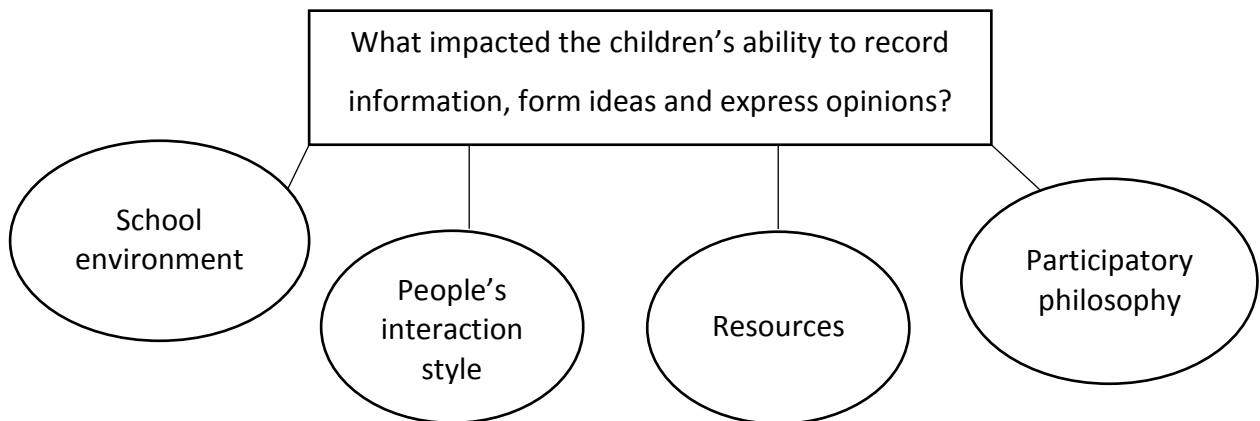


Figure 3.4: Pilot study global themes

3.5.1. Thematic network 1 Global theme: School environment

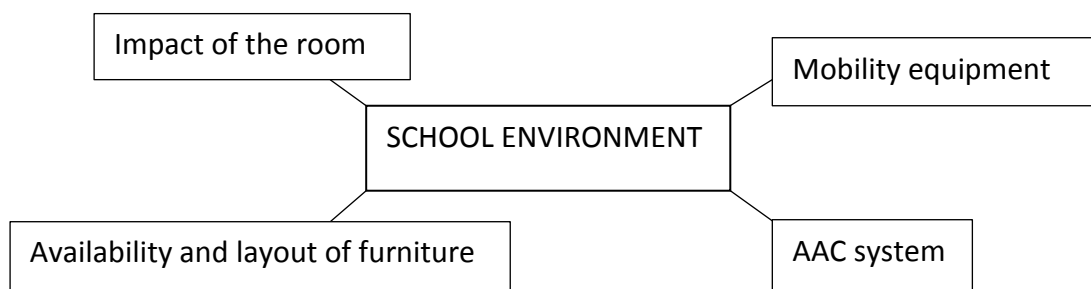


Figure 3.5: Thematic network, Global theme: School environment

The first thematic network that emerged from the pilot study was school environment. This covered aspects such as the impact of the room, mobility equipment, availability and layout of furniture, and the AAC systems. Child participant, Joanne, used an eye-gaze communication aid; the arrangement of existing objects within the school environment, such as furniture, and mobility and communication equipment, affected her opportunity to

convey her ideas in a group. Figure 3.6. shows the difference in flow of interaction between participants when the room is arranged in a typical group activity (sitting in a circle), compared to participants standing around Joanne and her communication aid. In the sitting arrangement, Joanne's view of the group interactions is blocked by her communication aid, which is on a tall stand, in line with her gaze. This means it is difficult for her to respond to questions or engage in group discussions. Higginbotham *et al* (2007) note that the hi-tech AAC device itself can become a barrier to social interaction particularly when access is through eye-gaze technology and the AAC user cannot utilise eye-gaze for establishing intimacy or social closeness with their communication partners (Higginbotham et al., 2007). In everyday interactions in the special education setting, both naturally-speaking peers and adult educators have been observed to spontaneously position themselves so they can see the VOCA (Clarke and Wilkinson, 2007; Tegler et al., 2020) suggesting that shared orientation to the device facilitates the interaction with the child who uses hi-tech AAC (Norén et al., 2013). However, in this case, I had set the room up in a circle so that the adult and child participants were prompted to orientate themselves to the box of objects on the floor. As the researcher-practitioner I needed to suggest that participants move towards Joanne, rather than stick to the planned activity layout. Participants then moved around the communication aid and took an object to Joanne. This meant that she could see the resources, other participants' faces, as well as her communication aid screen and she was consequently able to contribute to the group discussion. Rearranging the position of both objects and people the environment around the VOCA (on a stand) gave Joanne the opportunity to convey her perspective as well as facilitate her social interaction with the group.

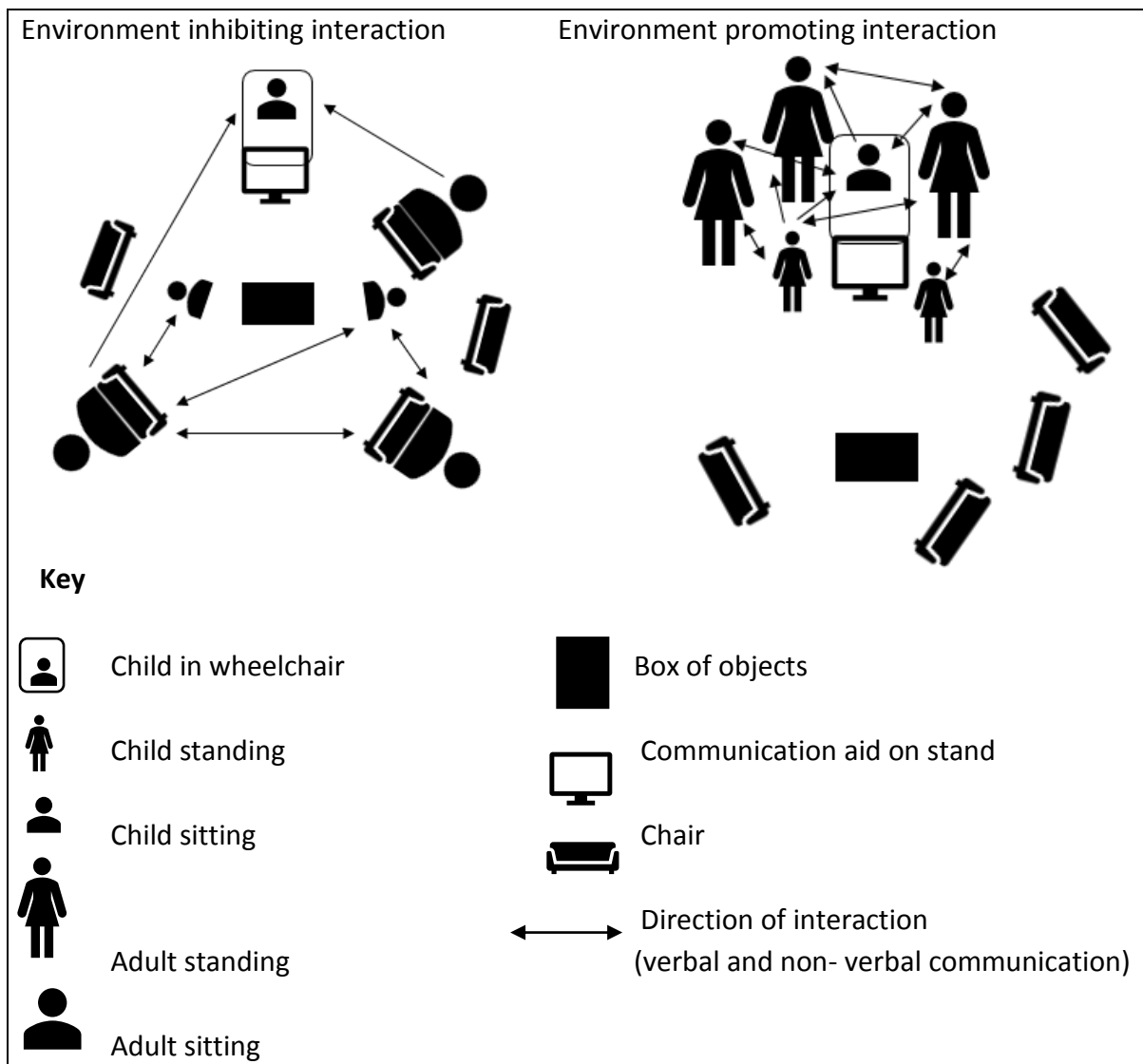


Figure 3.6. Flow of interaction impacted by the arrangement of the environment

3.5.2. Thematic network 2 Global theme: People

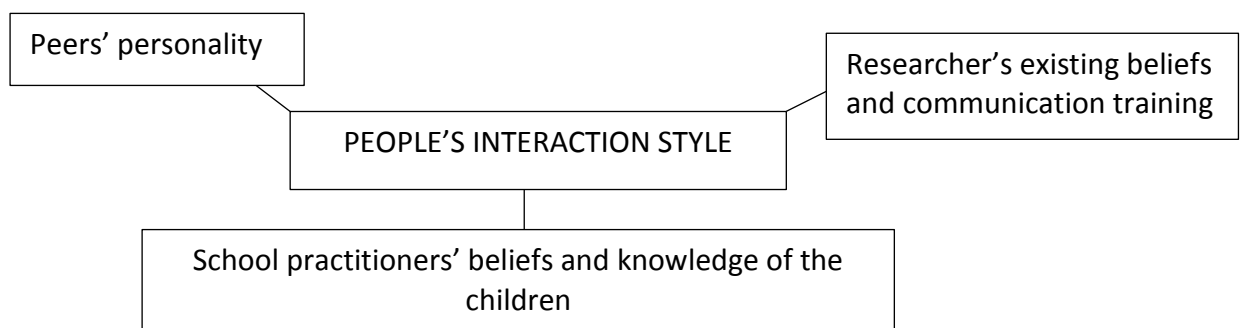


Figure 3.7: Thematic network 2 Global theme: People

Another area that impacted the children's ability to contribute was other people's interaction style. This included the idiosyncratic personalities of the child participants, the school practitioners' personalities, beliefs and knowledge of the children, and the researcher's (my) existing beliefs and communication training. Linda, an adult participant felt that the group design and inclusion of peers of children who use hi-tech AAC was positive and worked well:

Linda: I like that way of group working. I think it worked better for them. Cos, you know coming into a room and sitting one-to-one is a bit dull. It's dull for them. They're going to get bored of it and they are not going to want to use it [VOCA].
(Interview transcript)

Linda believed that the inclusion of peers promoted the use of a VOCA when compared with interacting one-to-one with an adult. Similarly, in her group-based participatory study, Ajodhia-Andrews (2016) concluded that the children were better able to explore their thoughts and feelings in a group with other children than would have been possible in a one-to-one conversation with the researcher. This may be because the interactions themselves were more fun and therefore motivating. Further analysis of participant interactions in this pilot study's video data supported this view. For example, there were instances of reciprocal laughing and smiling, suggesting shared enjoyment between Joanne who was using hi-tech AAC, and the other participants. Figure 3.8. shows the flow of interaction between participants completing a picture collaging and description task around the table. For approximately four and a half minutes communication remained in child/adult dyads, despite all participants being able to see each other around the table. However, at 4 minutes and 26 seconds the flow of interaction shifts as one of the children playfully sticks craft materials to her nose and tummy, rather than the paper.

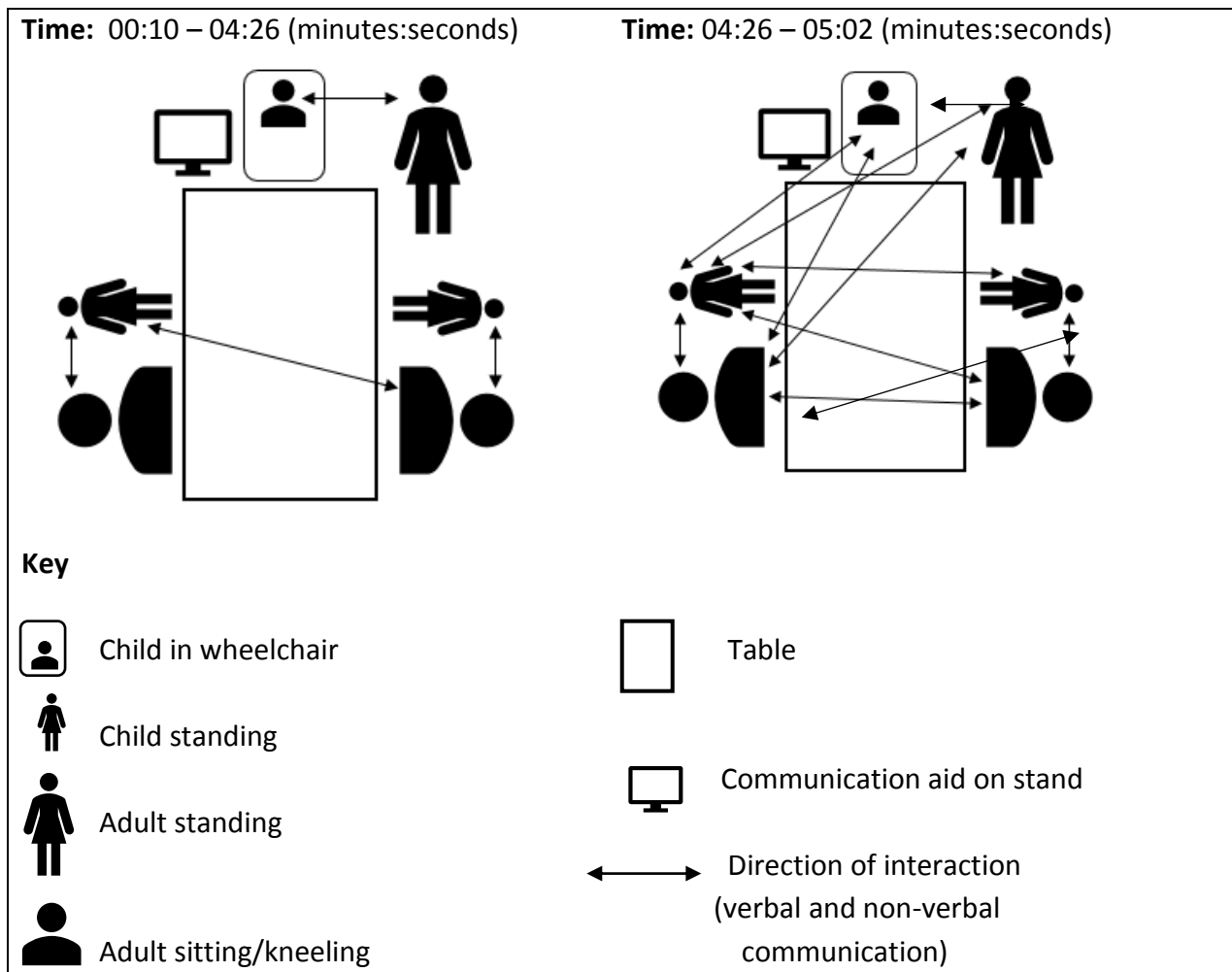


Figure 3.8: Impact of peers on the flow of interaction.

Both adults and children then engage in playful social interaction, as a child directs the interaction, rather than the adults. Clarke and Wilkinson (2007; 2008; 2009) note that children who use hi-tech AAC actively co-construct positive informal interactions with naturally-speaking peers and they laugh, tease and joke together despite significant communication difficulties. Conversely, teacher/student dyads might be orientated towards a goal which requires specific information related to the task rather than humour (Norén et al., 2013; Tegler et al., 2020). This can be seen in figure 3.8. when comparing the communication between child/adult dyads as the task of describing photos is carried out, compared to the child-led and playful social interaction that follows. Tentative evidence from the pilot study therefore suggested that the inclusion of peers with CCN positively affected interactions for children who use hi-tech AAC. Furthermore, for peer-to-peer interactions occur, adults needed to allow children the freedom to lead interactions in a playful way rather than solely focus on task completion.

3.5.3. Thematic network 3 Global theme: Resources



Figure 3.9: Thematic network 3 Global theme: Resources

The availability and type of resources also impacted the participants' interactions. Structuring the research sessions around the co-creation of each child's storybook (electronic and hardcopy) was perceived positively throughout the sessions by the adult participants. Solomon-Rice and Soto (2011) note that narratives mediated through hi-tech AAC unfold slowly. They recommend that SLTs keep a shared, written record of the hi-tech AAC user's personal narrative which can be used as a memory aid and revisited over the course of the interaction which lasted 46 minutes in their study (Solomon-Rice and Soto, 2011). In this pilot study, the multi-modal storybook played a similar role over several sessions and allowed the children to review what they had done in previous weeks and therefore focus on what they could do/say next.

As in previous studies including children with CCN, providing a choice of multi-modal resources for research activities was important for the children to contribute (Ajodhia-Andrews, 2016; Wickenden and Kembhavi-Tam, 2014). In this pilot study, this view was shared by the participating AAC teacher:

Linda: The resources were brilliant they were pitched right. Especially for Joanne, you brought the E-Tran, the symbols, she had her eye-gaze there if she wanted to use it. Adele had her communication aid. They had options there and if they didn't want to use it, they had another option. So, I just liked the fact that it was completely sort of multi-modal.

(Interview transcript)

A range of resources was therefore identified for inclusion in the main study: AACtion Hero kit (cape, ID badge), AAC symbol cards (opinions/adjectives), iPad/photo technology, collaging materials and the child-led tour of the school.

3.4.4. Thematic network: Participatory philosophy and resources

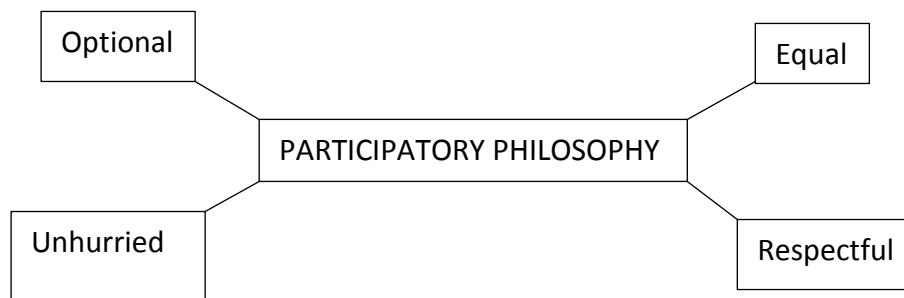


Figure 3.10: Thematic network 3 Global theme: Resources

Optional participation: Child decides to take part or not

The idea that adults should respect a child’s disengagement from a task, i.e., their decision to take part in an AAction Hero activity or not, was perhaps the largest departure from typical school activities for both the child and adult participants. In session one, child participant Daisy seemed surprised by this new philosophy, “Can I say no?” she said, when I asked if she liked bubbles. This suggested that child participants may need reassurance and support to ensure they understood participation was optional and they could say whatever they chose. Furthermore, pilot study data revealed tensions in maintaining a philosophy of optional participation as adults attempted to balance the needs of individual children with the needs of the group.

Linda: With Daisy, it kind of, she almost took over the running and how it was going because obviously she was so busy that it was preventing some other things happening, but I don't know how you could deal with that issue because if you put more control on it, then it doesn't become a child-led activity which is what I liked about it. And if you start controlling it, it then becomes an adult-led activity which it's not meant to be.

(Interview transcript)

I also noted an example of this conflict in my reflection journal:

We left Daisy to wander around the room and kept our eyes on Holly and Joanne. When she attempted to distract one of the group with something else, I spoke to her quietly, “We are not talking about bubbles at the minute Daisy, we are talking about sausage dogs” and continued to look at Joanne who was trying hard to say something about sausage dogs (i.e., activate her communication aid through eye-gaze). My response to Daisy was mirrored by Linda who whispered the same message when Daisy approached. This was a real balancing act of allowing Daisy the

freedom to leave the conversation but ensuring that Holly and Joanne's efforts were given the respectful attention of the group.

(Researcher reflection journal)

Facilitating the *group* of children was important for allowing the child who used hi-tech AAC to contribute. My interactions with Daisy whilst trying to facilitate the contributions of the whole group mirrored the findings of Tegler *et al's* (2020) study who observed interactions mediated through hi-tech AAC in a special education classroom where peers with CCN were also present. Tegler *et al* (2020) describe quieter side-sequences of dyadic interaction whilst the group discussion was ongoing, in which the teachers sensitively managed the interruption of peers to allow children who use hi-tech AAC to contribute (2.4.7). In this pilot study, quieter side-sequences of interaction were quickly followed by focussing on the group discussion and the child attempting to communicate through hi-tech AAC. This allowed me to model continuously behaviours and language which respected each child's opinion, including their choice to disengage and re-join the group when ready. This would be an important element to reflect on for the adult participants in the main study as it is unfamiliar and potentially difficult territory for them.

Equal: All using AAC; Sitting together at the table; Everyone gives their opinion

The notion of equality between adult and child participants was deemed a positive experience by Linda:

Linda: I liked how everyone was equal. Staff and pupils, everyone was equal, everyone had to use the same things, everyone had to use the symbols. [...] it made them feel as a team.

(Interview transcript)

Many aspects of the procedure aimed to reinforce the philosophy of equality, including visual reminders ('Action Hero' research kit); symbol-supported turn-taking (all participants give their opinion with AAC symbols); and the structure of the environment (all participants have a seat at the table). My communication and conduct were also important. Arguably, the researcher-practitioner is never truly equal to the participants, as they have initiated the group and set the rules and expectations; however, the principle of equal participation guided my interactions with the participants. For example, by ensuring that everyone could

contribute their ideas and allowing everyone to answer. This also involved slowing the pace of interactions to allow each child to contribute, and asking them, for example, “What do you think?”, followed by an expectant pause. Teaching communication partners to wait with an expectant pause is a common feature of communication partner training and is thought to support the expressive communication for individuals who use AAC (Kent-Walsh et al., 2015; Mathis et al., 2011). Nevertheless, this pause may be uncomfortable for the adult participants as it is longer than would typically be expected in spoken interactions (Mathis et al., 2011). Consequently, I had to maintain a relaxed appearance, being comfortable with long silences until everyone had the opportunity to contribute. This suggests that facilitating the pace of group discussion is integral for individual children who use hi-tech AAC to take a turn. In this way, the philosophy of children and adults as equals is linked to the next area for consideration: unhurried message building.

Unhurried: Structure of the session; long pauses in interactions; finish talk not tasks

The philosophy of unhurried message building was important both at the micro level of interaction, for instance waiting for children to contribute to a discussion, and at the macro level, for instance the overall structure of the participatory sessions. This slow message building was highlighted as a positive aspect of the study procedure:

Linda: I like how it gradually built up to gather the information at the end. So even though it was in sort of small parts every week it all sort of culminated.
(Interview transcript)

The structure of the sessions aimed to ensure that the child’s message was built on week by week. Communicating views through hi-tech AAC can be fatiguing and time-consuming for child participants (Batorowicz et al., 2014; Teachman and Gibson, 2018) therefore there were usually two or more opportunities for children to engage in each activity. Knowing this may have helped adult participants slow down and wait in interactions, rather than prompt the child quickly through the activity (finishing talk, not tasks). Being comfortable with a slow pace of interaction was a new experience for LSAs who are typically responsible for pupils completing curricular tasks. Therefore, I needed to offer reassurance where necessary that completion of tasks by the end of the session was not a priority.

Respectful: Accepting any communication mode; Presenting ideas to headteacher; Real consideration of the child's message

Being respectful of children's messages means respecting whatever communication mode the child wants to use to convey their ideas. For example, in the pilot study Joanne was given a choice of using either low-tech AAC symbols on an E-Tran frame or her eye-gaze VOCA. This highlighted that different AAC modes may be suited to different interaction situations for Joanne:

Linda: The nature of my job is to get them to use communication aids, the hi-tech stuff, but I haven't been including the lower-tech stuff. But now I'm thinking I should because what if they need a bit of both? So, I'll change that and include that into mine.

(Interview transcript)

Respect for all communication modes was a promising theme arising from the pilot study as concerns about privileging hi-tech AAC over low-tech have been raised by adult AAC users (Pullin et al., 2017). For eye-gaze users, hi-tech AAC may facilitate independent communication as the user need not rely on the communication partner to produce an aided-utterance. Conversely, a partner is needed to interpret and voice the messages accessed by eye-gaze towards paper-based systems. In this instance, paper-based AAC might be considered interdependent. However, at times, interdependent social interactions may be a more desirable outcome (Pullin et al., 2017) as well as being quicker and less fatiguing than independently communicating a message via a machine (Teachman and Gibson, 2018). Working collaboratively in AAction Heroes, may have helped the adult participants discover the variety of AAC modes that the child can utilise in interactions, emphasising that the child's perspective, not the mode, is most important.

Respect also comes in the form of managerial respect for the group's endeavours. In this research, participants were recruited through a gatekeeper (the headteacher). This was primarily an ethical consideration; however, it established the headteacher's interest and support for the project at the outset. Both the adult and child participants understood that the children's ideas would be presented to the headteacher who had the power to act on them if appropriate. This knowledge helped to facilitate new types of interactions

between the adult and child participants. Teachers and LSAs do not always have the power to make changes and act on the children's messages. Schools are hierarchical organisations which can serve to limit children's agency (Gillett-Swan and Sargeant, 2018) yet adults are subject to the same hierarchy as the children. For example, Daisy loved the library and, when we arrived, repeatedly asked to take a book home. The LSA replied: "No not home, we're here to take photos of things you like." McLeod (2018) suggests that children with CCN are at risk of not having their ideas taken seriously at school as the rules and expectations of the setting are set by adults. However, it may be that LSAs do not feel able to take children's ideas seriously if they are not able to make the suggested changes themselves. In the pilot study, the adult participants were able to reflect on Daisy's idea and agreed that she could put her suggestion (to take library books home) to the headteacher. Questioning the way things are within a well-established hierarchical system, like school, is only possible if you believe that the person/s at the top will consider your suggestions. Therefore, it is pivotal that the headteacher in the school is open to the respectful philosophy of the approach and is willing to hear and consider the group's perspective which may include ideas for change.

3.5. Pilot study conclusions

Implementing an approach underpinned by child-led participatory principles in a special education setting was impacted by the physical arrangement of the school environment, the talk and visible actions of the participating children and adults, as well as the material resources available. Co-creating the children's storybooks over a period of six weeks provided a central focus for the group's endeavours with the underlying aim of hearing the children's perspective on school. The storybook format allowed flexibility for each child to include the material resources which they found most helpful in telling their story, for example, Holly included her collage and drawings, whilst Joanne included photographs and symbols. In this way, the storybook was an adaptable, multi-modal artefact for conveying each child's personal narrative and detailed their views on school and, if relevant, their ideas for change. The ongoing contributions of the adult participants were identified as integral to being child-led in a special education setting. This was true in terms of macro time (co-creating storybooks over weeks) and micro time (co-constructing interactions

second-by-second). For example, by reflecting on the children's engagement in the child-led activities, adults could make adaptations to resources for the following session to ensure each child could actively participate. Furthermore, adults were able to trial new, child-led ways of interacting with the children such as using symbols themselves, slowing down, and pausing more in interactions. Given the importance of the adult's contributions, a formal 30-minute reflection session for the adult participants was included in the main study and structured with a crib-sheet adapted from the pilot study's global and organizing themes: themes which emerged as elements of the approach that impacted the children's ability to convey their perspective (see table 3.5.). The pilot study findings allowed me to refine the procedures within the three stages of the AAction Heroes approach, but also led me to reconceptualise the main study's aims and research questions. Refinements to the main study and the emergent research questions will be discussed in section 3.7.

Table 3.5: Crib-sheet for adult reflection in main study using pilot study themes

	What impacts the child's ability to convey their perspective?	What can we change next time?
School Environment Impact of room Availability and layout of furniture Mobility equipment AAC system		
Research Resources Action hero kit (cape, ID badge) AAC symbol cards (opinions/adjectives) iPad/photo technology Collaging materials Child-led tour of school		
People's interaction style Peers School practitioners Researcher		
Participatory philosophy <i>Optional</i> Child decides to take part or not <i>Equal</i> All using AAC Sitting together at the table Everyone gives their opinion <i>Unhurried</i> Structure of the session Long pauses in interactions Finish talk not tasks <i>Respectful</i> Accepting any communication mode Presenting ideas to head-teacher Genuine consideration of child's message		

3.6. Dissemination of the pilot research

There was an opportunity to present the pilot study design and findings at the British Educational Research Association (BERA) conference “Inclusion for all: the power of pupil voice for learners with SEND” on 24th March 2021. (See Appendix G for presentation slides). Although by this point the pilot investigation had been superseded by the main study, some attendee feedback was given via an online chat forum and emailed to presenters by the organising committee included:

“Thank you! Very interested to see how this could look as a viable pedagogy in classrooms going forward.”

“Thank you. That was so interesting! I’m now considering how I could try a similar approach to get pupils views on the rights respecting school and how we can use similar processes in our pupil council discussions.”

3.7. Refining the main study: a quasi-naturalistic experiment

The pilot study findings suggested that the child-led participatory philosophy and practices of AAction Heroes offered a different way of working in the everyday special education setting and may have changed the ways in which children and adults interacted together. In the main study, I wanted to explore these ideas further and examine the participant’s interactions within the child-led (AAction Heroes) context. This led me to revisit approaches for analysing videoed interactions. In their paper on work-based research, Heath and Luff (2018) describe the implementation of *quasi-naturalistic* experiments in which people may be asked to try something new in their everyday contexts, for example, trial a new set of practices in the workplace (Heath and Luff, 2018). Analysis of video recordings, participant interviews, and the researcher’s situated observations and reflections, are then used to reveal the processes involved in complex workplace activities, for example, how health professionals interact with each other and exchange implements to complete surgical procedures (Heath et al., 2018). Though Heath and Luff (2018) are discussing the social interactions of adults within organizations, comparisons can be drawn with this study which is also exploratory in nature and asked participants to trial something new (AAction Heroes) in their everyday school context. Like the quasi-naturalistic experiment, this study aimed to “explore the consequences of particular ideas and developments, [and] demonstrate their

potential contribution” (Heath and Luff, 2018, p. 483). That is, explore the consequences and potential contribution of taking a child-led and participatory approach for hearing the views of children who use hi-tech AAC, by analysing the participant’s interactions in an everyday special education setting.

Drawing on the findings of the pilot study, the main study was reconceptualised as a quasi-naturalistic experiment. That is, whilst the child-led approach was designed by the researcher, it is situated in the participant’s everyday context so that their interactions might still be considered naturally-occurring. The main study continued to focus on hearing the views of children who use AAC, with a focus on those who use hi-tech AAC³. Specifically, it sought to explore how participants co-created a personal storybook to hear the views of children who use hi-tech AAC (across six weeks), what happened to co-construction in interactions mediated through hi-tech AAC when adults attempted to be child-led (in seconds), and what contributions the adult participants would identify as important to the process. This would be important to see what, if anything, AAction Heroes might offer children who use hi-tech AAC in a special education setting, and if participants believed it to be viable approach given its novel and potentially challenging participatory philosophy.

Four research questions for the main study emerged from the pilot study findings and existing literature (3.8). The methodology and methods used to address the main study’s research questions will be detailed in the following chapter.

³ Every child participating in AAction Heroes (in the pilot and main study) co-created a storybook as a means of adults’ hearing and responding to their views within their special education setting. This approach was important to explore if participating in AAction Heroes was a potentially valuable experience for all child participants with CCN, or indeed all children outside of a research experience. As previously indicated, the original focus of this research was on hearing the views of hi-tech AAC users. Consequently, the main study’s research aim, questions and subsequent data collection and analyses reflects this focus on hi-tech AAC users.

3.8. Main study research questions

1. In the process of personal storybook *co-creation* (over six weeks) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?
2. In the process of message *co-construction* (in seconds) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?
3. What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use hi-tech AAC and their peers?
4. Is co-creating children's personal storybooks (AAction Heroes) a viable way of working with children who use hi-tech AAC in the special education setting?

4.0. Chapter 4: Main study: Methodology

4.1. Introduction

This research was underpinned by the principle that all children have a right to express their views (United Nations, 1989) including those who use minimal or no speech who may express themselves through other media (Gillett-Swan and Sargeant, 2018; Bradwell, 2019). As demonstrated in the literature review, hearing the views of children who use hi-tech AAC is not straightforward. Participatory and child-led research with children who use hi-tech AAC is limited and ways of exploring their views need to be established. Previous research into interactions mediated through AAC in the special education setting has highlighted the characteristics of co-construction in interaction between children who use hi-tech AAC and their communication partners. Some tentative theories of what child-led co-construction might look like have been made yet continuing research into this is warranted.

Drawing on the AAC participatory and interaction literature, I developed a child-led and participatory approach for hearing the views of children who use AAC and their peers in their special school setting. In the pilot probe, AACtion Heroes was developed and refined. In the main study, AACtion Heroes was repeated, but reconceptualised as a quasi-naturalistic experiment addressing four research questions (3.8). This chapter will present the aim (4.2) and philosophical underpinnings of the main study (4.3). It will provide a rationale for the methodology and methods chosen to address the research questions. The study's procedures detail the data collection (4.6) and analysis methods (4.7) used to address each research question.

4.2. Main study aim

The main study aimed to explore the consequences and potential of taking a child-led, and participatory approach to hearing the views of children who use hi-tech AAC in an everyday special education setting. Specifically, it aimed to explore the macro and micro processes of interactions mediated through hi-tech AAC whilst participants were aiming to be child-led, and examine if taking a novel, participatory approach was viable in an everyday special education setting.

4.3. Philosophical underpinnings of the research

The philosophical underpinnings of the research are outlined in brief in figure 4.1. This includes ontological and epistemological assumptions and the theoretical framework which underpin the methodology (see also pilot study figure 3.1). This is then expanded under the following sub-headings: Ontology, epistemology and theoretical framework; Methodology: the quasi-naturalistic experiment; Methods: data collection and analysis.

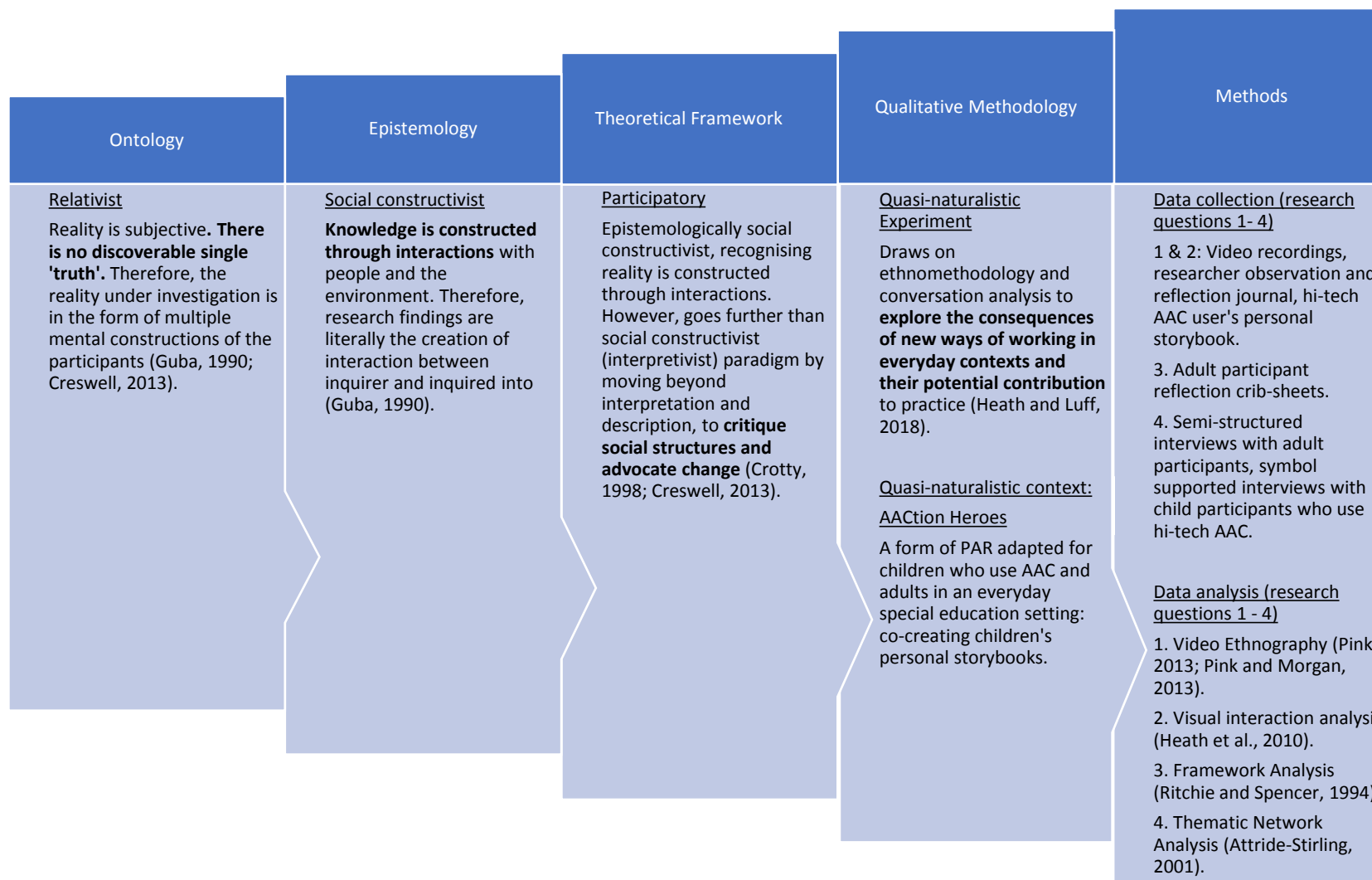


Figure 4.1: Main study philosophical underpinnings

4.3.1. Ontology, epistemology, and theoretical framework

Qualitative research is concerned with exploring and understanding the meanings that individuals or groups attribute to their social situation or problem (Crotty, 1998; Creswell, 2009). Conversely, quantitative research is concerned with testing a hypothesis by controlling the context of the study and measuring variables (Creswell, 2009). The main way that qualitative and quantitative approaches differ is that they assume different philosophical perspectives about the nature of reality (ontology) and the nature of knowledge (epistemology) (Crotty, 1998). Quantitative research holds a positivist philosophical position whereby reality is governed by immutable laws which can be objectively studied and measured (Guba, 1990). Generally, qualitative research tends towards a relativist and constructivist philosophical position. This means that reality is not constant and immutable but *relative* depending on who perceives it (Crotty, 1998; Guba 1990).

AAC invention studies typically set out to measure changes in individual children's communication across pre- and post-therapy conditions or to compare one intervention to another (Baxter et al., 2012a; Schlosser and Koul, 2015). By contrast, this study would be highly exploratory in nature: it would not aim to use controlled conditions to test an objective theory; rather, to explore ways to hear the views of children who use hi-tech AAC in an everyday special education setting. This would be done through collaboration with child and adult participants in their everyday setting. In keeping with a socially constructivist epistemology, this study would not assume that knowledge was there to be discovered: rather that knowledge is socially constructed through the research process (Guba, 1990). Further, this research's theoretical framework was participatory. Therefore, knowledge would be constructed through social interactions with the participants whereby the researcher and the participants collaborated to look at how things were, consider new ways of doing things, and advocate potential change in ways of doing things (Crotty, 1998; Creswell, 2013). Therefore, a qualitative research design was considered appropriate for addressing the research problem.

4.3.2. Qualitative methodology: the quasi-naturalistic experiment

Through evaluating the pilot study findings, I theorised that participating in AACtion Heroes may have changed the ways in which adults and children interacted together. In the main study I aimed to examine this further. Subsequently, I revisited the literature regarding the analysis of everyday social interactions (3.7). Heath and Luff's (2018) quasi naturalistic experiment draws on ethnomethodology and conversation analysis (CA) to analyse participant's social interactions and explore the consequences of applying new ways of working in everyday contexts, rather than controlled laboratory conditions, thereby assessing their potential contribution to real-world practice (Heath and Luff, 2018). AACtion Heroes would create a child-led context, notably one in which the contribution of talk, visible actions and material artefacts on interactions mediated through hi-tech AAC could be analysed. Similarly to quasi-naturalistic workplace experiments, this study was not "solely concerned with exploring the use of a specific set of practices, techniques, or technologies but rather with exposing the unknown or unexpected aspects of social organization that enables the concerted accomplishment of particular actions and activities" (Heath and Luff, 2018, p. 469).

4.3.3. Methods: data collection and analysis

To meet the aims of the main study, the AACtion Heroes approach would need to be assessed against four research questions, each necessitating a different methodological framework. Methods were needed to investigate social interactions on two levels: over macro time; how talk, visible action and material artefacts contributed to the wider *co-creation* of a storybook with a child who used hi-tech AAC over six weeks (RQ1), and secondly in micro time; a fine-grained exploration of the *co-construction* processes in specific fragments of interactions mediated through hi-tech AAC in seconds (RQ2). Methods were also required that could establish what adult contributions helped facilitate the co-creation of children's personal storybooks, from the perspective of the adult participants themselves (RQ3). Finally, it needed a way to examine the viability of AACtion Heroes from the perspectives of the participating educators and children who use hi-tech AAC (RQ4). In the following sections I outline the explanation of data collection and analysis methods that

were considered in answering research questions 1 – 4 and a rationale for the procedures chosen.

Consideration of ethnographic approaches: Research question 1

Research question 1⁴ necessitated an examination of participant's interactions over macro time. To do so, the research would need to capture the lived experience of co-creating personal storybooks with children who use hi-tech AAC and their peers in an everyday special school setting whilst focussing on *how* the co-creation of storybooks was accomplished through participant's talk, visible actions, and material artefacts (Heath and Luff, 2018).

As detailed in the literature review (2.3.3.) previous authors have captured the lived experiences of young people who use hi-tech AAC (Wickenden 2011a; 2011b) including their experience of school (Howery, 2018). Both Wickenden (2011a; 2011b) and Howery (2018) observed and were involved the lives of their participants for many months and in some cases years to create ethnographic accounts from an anthropological (Wickenden; 2011a) and phenomenological (Howery, 2018) perspective. An ethnographic account may have allowed me to forefront the macro detail of several research encounters, but I would not have the rich detail of several months/years of participant observation on which to base my account. Subsequently, I investigated short-term or 'focussed' ethnography as a potential method (Pink and Morgan, 2013). Pink and Morgan's (2013) paper on the benefits and limitations of short-term ethnography suggests that close analysis of video recordings and/or other images can create a "depth of data and immersion" (Pink and Morgan, 2013, p. 353) when long-term research encounters are not possible or practical. However, Pink (2013) also cautions that video recordings are not themselves 'ethnographic' and do not faithfully record an event from the perspective of the participants. Rather, close analysis of video by the ethnographic researcher allows them to reflect on and construct a version of how the participants lived and performed certain tasks *from the perspective of the researcher* (Pink, 2013). Unlike long-term anthropological and phenomenological

⁴ In the process of personal storybook *co-creation* (over six weeks) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?

ethnographic approaches, the researcher cannot claim to be immersed in and/or experiencing the lives of their participants (Wickenden, 2011b; Howery, 2018). It is important therefore to recognise the limitations of visual/video ethnography and ensure readers of the ethnography understand that it is the researcher's, rather than participant's perspective.

Video ethnography is suitable for short-term research encounters as close analysis of videoed participant interactions can be contextualised by the researcher's detailed observation and reflective fieldnotes (Pink and Morgan, 2013; Pink 2013). Detailed and faithful dialogue can be identified in the video data and embedded in the ethnographic account (Ghodsee, 2016). However, in this study, video of interactions mediated through hi-tech AAC would require a specific approach to transcription to capture visible actions in addition to talk. Therefore, I required AAC specific notation and transcription (Higginbotham and Engelke, 2011; von Tetzchner and Basil, 2013) to capture detailed interaction (rather than dialogue alone) which could then be embedded within my ethnographic account. The procedure I followed for conducting video ethnographic analysis is detail in section 4.5.6.

Consideration of micro-analysis approaches: Research question 2

Research question 2⁵ necessitated a fine-grained micro analysis of participant interactions in micro time. I wanted to examine co-construction processes mediated through hi-tech AAC when participants were interacting in a child-led (quasi-naturalistic) context. As discussed in the literature review (2.4.3.) the majority of AAC interaction studies in the everyday special education setting have used Conversation Analysis (CA) to analyse fragments of videoed interaction (Clarke and Wilkinson, 2007; 2008; 2009; Norén et al., 2013; Savolainen et al., 2020; Tegler et al., 2020). CA has been instrumental in revealing the characteristics of co-construction processes in everyday interactions mediated through hi-tech AAC (Higginbotham and Engelke, 2013). CA allows the researcher to examine the nature of talk and visible actions in detail and inductively code what participants themselves treat as communicative resources (Clarke and Wilkinson, 2009). That is, CA aims to reveal "how

⁵ In the process of message *co-construction* (in seconds) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?

participants themselves play a central role in establishing and reproducing the context specific nature of their interactions” (Hutchby, 2019, p. 15). Forefronting the participants’ skills and role in establishing meaning in their interactions is arguably in-keeping with a participatory and participant-led perspective and a potentially suitable approach for this study.

CA is a well-established method in the field of AAC interaction research. However, through my investigation of Heath and Luff’s (2018) quasi-naturalistic experiment, I explored Heath *et al*’s (2010) related methods for analysing everyday interactions. Quasi-naturalistic experiments draw on ethnomethodology and CA for understanding how organisational activities and actions are achieved through the participant’s social interactions (Heath et al., 2010). As in AAC interaction studies which utilise CA, Heath *et al* (2010) conduct an inductive microanalysis of participant’s videoed interactions to see what the participants themselves treat as meaningful. However, their *visual* analysis places more emphasis on the visual aspects of the interactions such as the participant’s visible actions and use of material artefacts (Heath et al., 2010). In this study, participants would be engaging in activities where visual, material artefacts were central, for example, collaging with photographs (see table 4.4.). A visual analysis drawing on the principles and practices of CA could be an ideal method with which to examine interactions mediated through hi-tech AAC within an experimental context utilising material artefacts. Therefore, I used Heath *et al*’s (2010) visual approach to interaction analysis in this study. The procedure I followed for conducting visual interaction analysis is detailed in section 4.5.6.

Consideration of content analyses: Research question 3

Research question 3⁶ necessitated a method of analysing the adult participant’s ongoing reflections and views during their participation in AACtion Heroes. Adult participants would be invited to contribute to a 30-minute reflection session after sessions 1-5 (with the children) to reflect on what they needed to maintain or change to support the children to convey their perspectives. This reflective discussion was to be facilitated by a pre-prepared

⁶ What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use hi-tech AAC and their peers?

crib-sheet developed using the pilot study themes (see 3.5.). In theory, I could use the crib-sheet in a process of deductive analysis, that is, use the existing pilot study themes to code the new data (Hsieh and Shannon, 2005). However, in-keeping with the participatory theoretical framework, I wanted to ensure the beliefs and experiences of the adult participants in the main study were explored and fully represented in the research findings. Therefore, I would need to approach data analysis from both a deductive and inductive perspective.

Framework Analysis (Ritchie and Spencer, 1994) has been used across qualitative research and allows researchers to employ an existing framework to deductively analyse data, whilst at the same time, adding new concepts through an inductive analysis of new data (Gale et al., 2013). Therefore, I used framework analysis as a means of deductively coding to the existing pilot study themes (as represented in the crib-sheet, table 3.5.) whilst openly exploring the views of the adult participants in the main study. The procedure I followed for conducting a framework analysis is detailed in section 4.5.6.

Consideration of interviews and analysis: research question 4

Research question 4⁷ necessitated an exploration of the views of the adult participants and the children who use hi-tech AAC on the whole approach. Reflecting on the pilot study, I concluded that interviewing one adult participant limited the information I gained as I only explored the specialist AAC teacher's views: the participating LSAs may have had different perspectives on the approach. Consequently, in the main study, I decided to conduct semi-structured interviews with all adult participants. Furthermore, in-keeping with the participatory philosophy, I wanted to ensure the views of children who use hi-tech AAC on the AACtion Heroes approach were also included in examining its viability. Interviewing both adults and children who use hi-tech AAC would ensure I explored the viability of the AACtion Heroes approach from the perspective of participants who may have diverse views.

In addition to conducting semi-structured interviews with the adult participants, I required a method of interviewing which was suitable for children who use hi-tech AAC. As

⁷ Is co-creating children's personal storybooks (AACtion Heroes) a viable way of working with children who use hi-tech AAC in the special education setting?

detailed in the literature review (2.3.7.) semi-structured interviews have been used to explore the views of children and young people who use hi-tech AAC on a range of issues including their social participation (Batorowicz et al., 2014), leisure activities (King et al., 2014), inclusion (Teachman et al., 2020), and social media experiences (Hynan et al., 2014; 2015). However, semi-structured interviews can take many hours and/or require multiple encounters so that children who use hi-tech AAC can express their views (Teachman and Gibson, 2018). Midtlin *et al* (2015) used Talking Mats™ (Murphy, 1998) in single interviews with their participants who used hi-tech AAC to ascertain children's views on what strategies they wanted their communication partners to use. A visual rating scale was used so that participants could place symbols related to the research question in proximity to the feeling that represented their view, e.g., like/not sure/don't like (Midtlin et al., 2015). This would be a suitable means of asking children their views on AAction Heroes as I could represent various elements of the approach on symbols or photographs, ask children after they had participated in 6 weekly sessions (potentially enough time to form a view on the approach), and participants would be primed to using visual rating scales as rating scales were embedded in AAction Heroes activities (see table 3.2.).

The research approach required a method of analysis that could capture both the adult and child interview data, and an analysis approach that inductively explores the participant's views in relation to the research question whilst acknowledging the participants' accounts as being socially produced (Braun and Clarke, 2006). That is, I was interested to examine the underlying ideas and assumptions that may be associated with a sociocultural context; in this case – a special education setting. Therefore, I utilised (latent) thematic analysis which aims to interpret what underlies the participant's ideas and views rather than just the semantic content of what they said (Braun and Clarke, 2006). Thematic Networks Analysis (TNA) (Attride-Stirling, 2001) proved a valuable and systematic approach for analysing and representing the pilot study data. In the main study I used TNA methods (Attride-Stirling, 2001) whilst considering the data from a latent thematic analysis perspective (Braun and Clarke, 2006). The procedure I followed for conducting a TNA is detailed in section (4.5.6.).

4.4. Amendments to ethical approval

The main study utilised the ethical approval of the pilot study with some necessary amendments. Parental consent forms in the pilot study stated that video/images would be used for analysis only and deleted on completion of the project. However, due to the adapted aims of the main study a level of visual analysis was required in addition to the written transcriptions to illustrate the contribution of visible actions and material artefacts to the child's communication. An ethical amendment was requested and approved which updated the participant information sheets to reflect the adapted aims of the study as well as offering parents a choice to consent for visual data to be used for analysis then destroyed immediately or used for analysis and in the researcher's final thesis and conference presentations for the next 5, 10 or 15 years (see appendix H). All parents consented to their children's visual data being used in the final thesis and presentations and destroyed after 5 years.

4.5. Main study participants

4.5.1. Inclusion/exclusion criteria

I aimed to recruit school-aged participants at primary-school stage - aged between 7;0 (years;months) and 12;11 from the same class, who used a low or hi-tech AAC system with an expressive vocabulary of at least 20 words. A minimum of one child in the group must have used a hi-tech AAC system for a minimum of 24 months. As this was a research-primed investigation, I excluded children who had participated in the pilot study.

The pilot study findings demonstrated that children required a certain level of cognitive and communication skills to engage with the AACtion Heroes research activities and discussions. For example, participating children needed to be able to understand symbol-supported rating scales to express their opinions, like/not sure/don't like; listen to their peers and take turns in a short group activity; and understand the concept of dressing up as an Action Hero. In a special education setting, there may be a variation in children's CCN irrespective of chronological age, so age may not be the most effective measure of cognition or communication skills. To reflect this, an inclusion checklist was developed for the main study, covering age, attention (Cooper et al., 1978) play (Sheridan et al., 2011), understanding, expression and social skills (Sheridan et al., 2007). The purpose of the

checklist (see appendix I) was to assist the gatekeeper (in this case the specialist AAC teacher) to have conversations with class teachers and identify children who were aged between 7;0 and 12;11 and who would be likely to understand and participate in AAction Heroes activities.

4.5.2. Recruitment and consent

Participants were recruited via gatekeepers at the same educational setting as the pilot study. Two children who used hi-tech AAC and two peers with CCN from the same class were identified by the gatekeeper. The children’s parents were approached to take part in the study but only three parents gave consent, therefore three children were included in the main study, one hi-tech AAC user and two peers (see table 4.3. for anonymised child participant information). Children provided assent (Appendix J). Their ongoing assent for participating in the research activities was continually monitored throughout the study. One child withdrew their assent from the study after session 3 (detailed in table 5.1 in chapter 5). Adult participants were recruited via gatekeepers who approached two LSAs who were highly familiar with the child participants. The study was explained to each adult participant and consent was obtained prior to commencing the study (Appendix E). The specialist AAC teacher who participated in the pilot also participated in the main study (see table 4.5 for adult participant information). I was a researcher-practitioner who both facilitated and engaged with the participants and research activities.

Table 4.1: Child participants

Participant* Pseudonym	Age	Medical Diagnosis	Expressive communication, including AAC system	Mobility
Cai	10;1	Autism Spectrum Disorder (ASD)	Single words, word-approximations, vocalisations. Hi-tech AAC system: Grid Pad 10 with Gridplayer 3 software	Ambulant
Shaun	11;3	Global Developmental Delay, Cerebral Visual Impairment, Epilepsy.	Short sentences, word-approximations, gestures, Makaton, facial expressions.	Ambulant

Kojo	10;2	Autism Spectrum Disorder (ASD)	PECS book (low tech AAC), single words	Ambulant
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**All participants identified by the teacher were male, but this was a coincidence and was not a requirement of the study.*

Table 4.2: Adult participants

Participant pseudonym	Role	Years in role
Linda	Specialist AAC teacher	15+
Moira	Higher-level LSA	15+
Kate	LSA	<5

4.6. Main study procedures

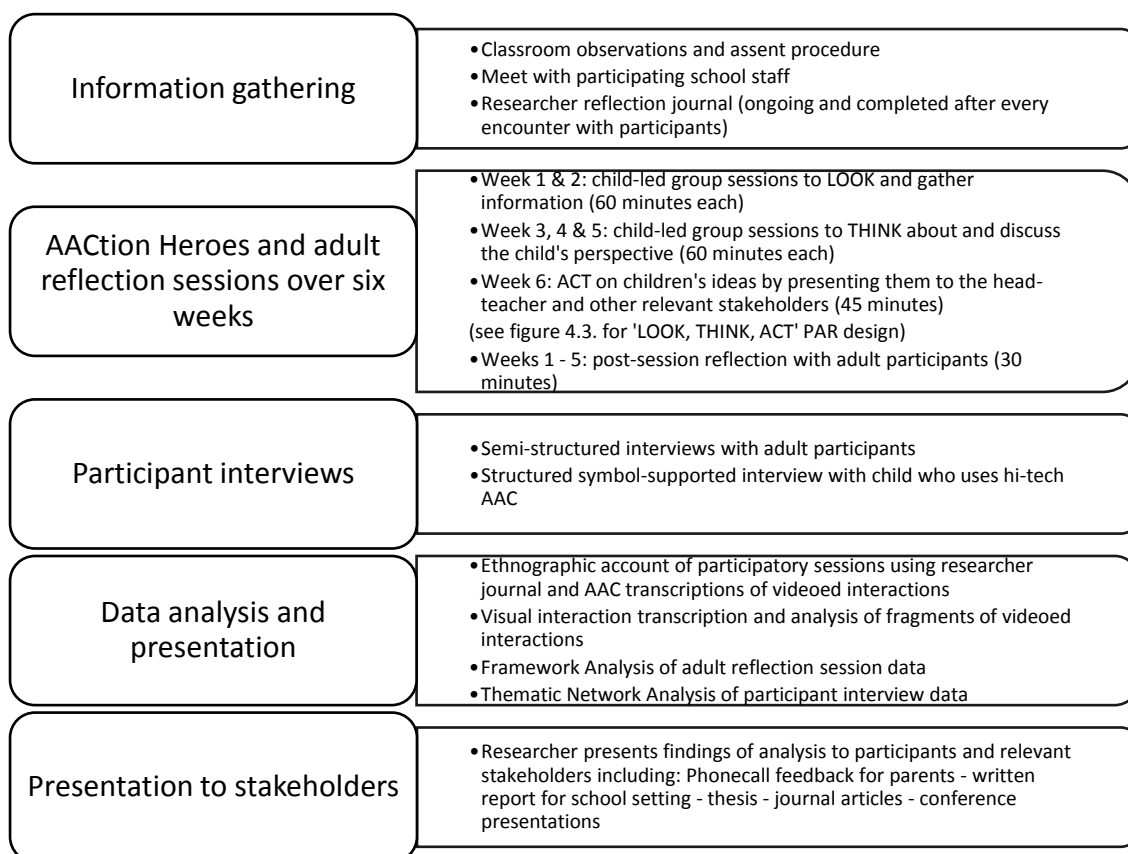


Figure 4.2: Main study procedures

Figure 4.2. shows the procedures undertaken in the main study from information gathering through to presenting the findings to stakeholders. Each stage of the study, and the procedures required to collect data at each stage, is then described in detail under

subheadings: Information gathering procedures; AACtion Heroes and adult reflection sessions; Participant interviews; Data presentation and analysis.

4.6.1. Information gathering procedures

Children with CCN have diverse strengths and needs. To ensure AACtion Heroes approach could be implemented, and the research successful, I would need to gain an understanding of each child's unique communication profile so that I could adapt my own communication accordingly, explain the study to each child participant using the symbol-supported participant information sheet (appendix J), and ask for their assent. Information regarding the children's communication methods would also allow me to make changes to the AACtion Heroes activities before starting the sessions, if required. Therefore, as in the pilot investigation, I conducted classroom observations of the children using a proforma to structure my observations. I created a proforma (appendix K) based on the pilot study and by adapting several existing AAC observation proformas and the communication stages theory into one document (Lee et al., 2012; Blank and Franklin, 1980; Department for Education, 2017; Dowden, 1999).

Adult participants were provided with information leaflets and consent forms (appendix E) prior to commencing the study. The rigour of a qualitative study can be developed through its reflexive documentation (Flick, 2014). Therefore, I planned to write field notes (observations) and personal reflections after every encounter with participants on the school site. This would enable me to examine my own assumptions about the participants' interactions from my standpoint: as a white, female, speech and language therapist and researcher. In these notes I would aim to document an honest account of the successes and difficulties in conducting the study from my perspective and maintain a detailed written record that would provide the basis of my ethnographic account (Ghodsee, 2016).

4.6.2. AACtion Heroes and adult reflection sessions

The aims, activities, and methods of data collection across the six (three stage) participatory sessions in the main study were refined as a consequence of the pilot study (see figure 4.3).

Procedures for each activity in the main study are summarised in the group session plans below (see tables 4.3. – 4.7.). Group sessions in weeks one to five were followed by 30-minute reflection session with the adult participants. The crib-sheet developed from pilot data themes directed these reflection sessions (see table 3.4). I asked each adult participant to highlight something on the crib-sheet that they felt was important. I then recorded the discussion directly onto the crib-sheet and provided them with a word-processed document in the following session as a process of participant validation (Flick, 2014). Each session with the children was adapted based on the adult's reflections in the previous week. As a result, though the planned activities were constant, some child specific changes in the delivery of activities occurred. Both planned and actual activities are detailed in tables 4.3 – 4.7.

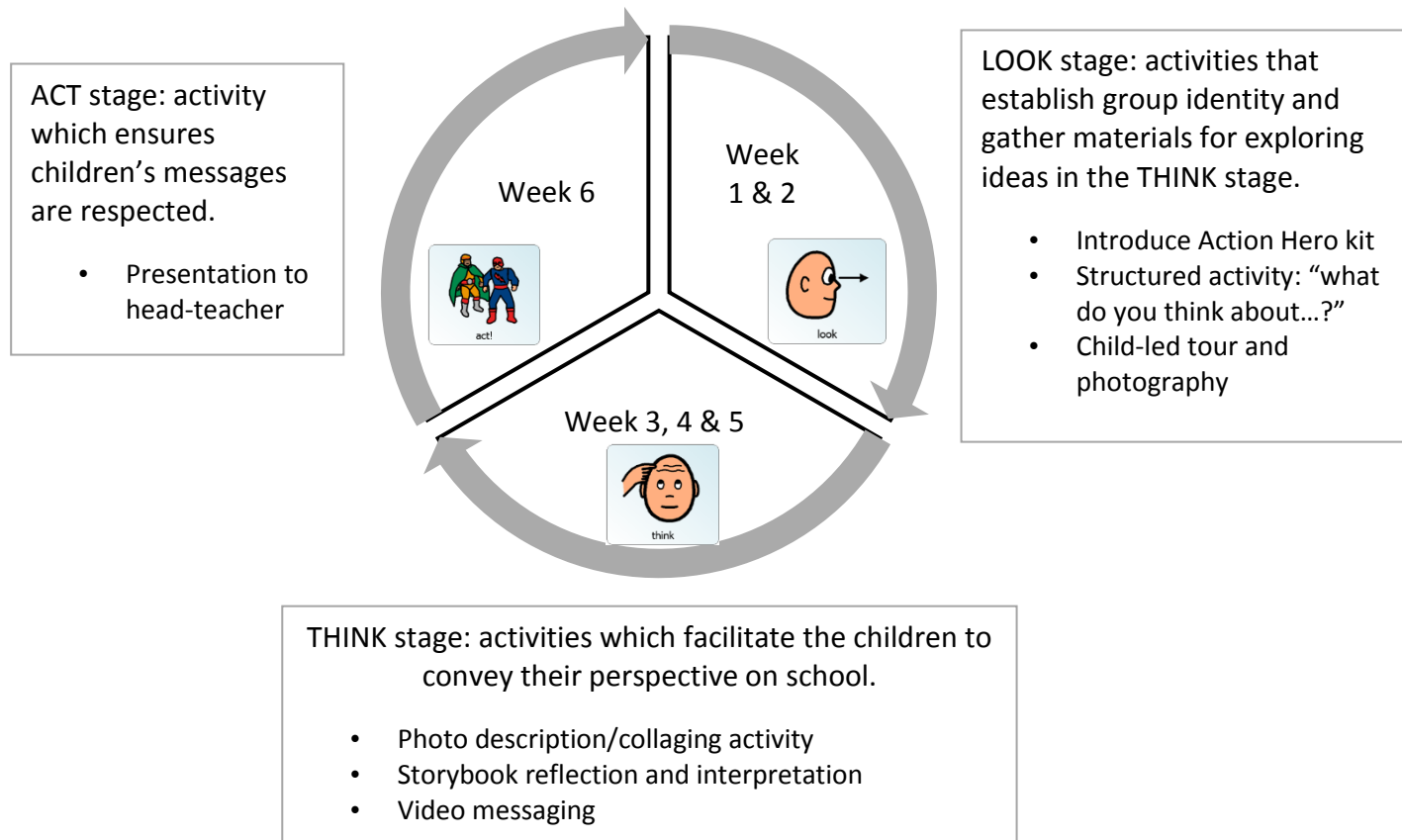


Figure 4.3: AAction Heroes 'look- think-act' PAR stages and related activities

Table 4.3: LOOK stage - Sessions one and two

Activity	Aim/rationale	Procedure	Resources	Research data
<p>Action hero kits and PowerPoint explanation. 5 minutes</p>	<p>‘Action Hero’ kit aims to foster a sense of playful equality and camaraderie between children and adults, children and adults can use symbols to communicate. Positions the children as having agency in their environment and can effect change. PowerPoint presentation visually explains the aims of the group’s activities.</p>	<p>Hand out kits and let participants find their photo ID badges. Use a PowerPoint presentation which includes a slide of the symbol-based assent sheet to support verbal explanation of the project to the group. Explain that the headteacher is interested in the children’s ideas about school and we are going to make a presentation (like the one you are showing them) together. The headteacher will come and watch the presentation in 5 weeks. Wearing capes and badges is optional. It should be made clear that children can opt out of wearing them and their choice will be respected. It is also helpful to check if the child finds it uncomfortable to wear, e.g., the child may not want the cape around their neck but happy to have it on their wheelchair.</p>	<p>PowerPoint presentation including symbol-based participant info sheet *.⁸ Action Hero kit: cape, ID badge, like/don’t like/not sure symbols.* Video camera Tripod</p>	<p>Video of group interactions Researcher reflection journal</p>
<p>What do you think about ...? 20 minutes</p>	<p>To provide a structured opportunity for all participants to practice giving their opinion using symbols, thus slowing down the pace of interactions. To emphasise equal child/adult participation in group activities at the outset of the session.</p>	<p>Children and adults take it in turns to say what they think about an object in the box. Adults should model using the symbols to support their expression. This slows the pace of adult communication and turn-taking is set at the children’s pace. For example, Participant A pulls a silly hat out of the box. Researcher asks the group, “What do you think of that silly hat?” Adults model using the symbol strip to support their answer, e.g. “I’m not sure about it” ((pointing to the <i>NOT SURE</i> symbol)). Each participant is asked their opinion on the hat. The children can use any mode of communication</p>	<p>Box of whimsical objects: e.g., baked beans, silly hat, googly-eyes glasses, wind-up toy, noisy toy etc. Like/don’t like/not sure symbols. Video camera Tripod.</p>	<p>Video of group interactions Researcher reflection journal</p>

⁸resources marked with * were made with Boardmaker™ software

		to answer the question, e.g., communication aid, sign, or pointing to symbol. Adults may wish to model giving different opinions to each other to highlight that people can have different opinions and that disagreement is acceptable. This may encourage children to give their honest opinion rather than what they think they should say.		
Child-led tour of school & photography. 30 minutes	To provide children with the opportunity to lead group activities. This will also give an indication of the places that are important to them. Photography may add further detail in terms of what objects/people/spaces etc are important. The children can use the photographs in THINK stage sessions to set the topic of discussion.	Low-tech AAC symbols representing rooms in the school are presented to the children on a choice board. An adult will point to each card and say the room name to make choices clear. Each child takes it in turns to choose where they would like to take the group. When at the location, children are free to explore the room and take photos of whatever they want. Adults may offer physical support if required.	Velcro symbol cards (room choices)* Choice board +/- e-tran frame Children's own hi-tech AAC systems School iPads	(No video as other children around the school will not have given consent) Children's photographs Researcher reflection journal
End session 5 minutes	To provide a summary of the group's activities and what can be expected next week.	Collect the Action Hero kits. Give a simple verbal summary of where the group has been today and where we could visit next week.		
Reflection session 30 minutes (post child session)	To provide opportunity to gather reflections from adult participants.	Ask each adult participant to highlight something on the crib-sheet that they felt was important. Record discussion directly onto the crib-sheet and provide them with a word-processed document in the following session.	Crib-sheet	Word processed crib-sheet

Table 4.4: THINK stage - Session three

Activity	Aim/rationale	Procedure	Resources	Research data
Action hero kits 5 minutes	As above. See table 4.3.	Hand out kits.	Action Hero kit	Researcher reflection journal
What do you think about...? 10 minutes	As above. See table 4.3.	Repeat procedure for sessions 1 and 2. However, the objects in the box should change to maintain the group's interest. The activity can be shortened by taking fewer turns, i.e., only one or two participants choose an object, but everyone gives their opinion on it.	Box of whimsical objects	Video of group interactions Researcher reflection journal
Photograph collaging and discussion. 30 minutes	For children and adults to explore the children's perspectives together using visual resources to support co-construction of messages.	Structure the environment so that everyone has a seat around the table for a creative task. This facilitates a conversational tone rather than 'question and answer' style activity. Give out the collaging materials. Support the children to look through their photos and choose which one they would like to talk about, ensuring children are leading the topic of conversation. Much of these interactions will be in child/adult dyads before expressing ideas to the group. The template will help adults interpret the children's perspective. However, question prompts and sentence completion tasks are suggestions/optional and are intended to support interactions rather than provide a worksheet that needs to be completed.	Symbol-based collage template* Adjective symbols* Children's own AAC systems Felt pens Ready-made catalogue images Glue sticks Adapted scissors Photographs from sessions one and two	Video of group interactions Researcher reflection journal Photographs of the participants' final picture (originals given back to children)
Feedback and end session 15 minutes	To provide an opportunity for children to express their views to the group.	The children take it in turns to show the group their collage and tell the group about it in whatever communication mode they choose. Collect research kits.	Child's collage.	Video of group interactions Researcher reflection journal.
Reflection session 30 minutes, post child session.	As above, see table 4.3.	As above, see table 4.3.	As above, see table 4.3.	As above, see table 4.3.

Post-session	Collate children's collage pictures into a PowerPoint presentation in a storybook format in readiness for group session four.
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Table 4.5: THINK stage - Session four

Activity	Aim/rationale	Procedure	Resources	Research data
Action hero kits 5 minutes	As above. See table 4.3.	See table 4.3.	See table 4.3.	See table 4.3.
What do you think about...? 10 minutes	See table 4.3.	Repeat procedure for sessions 1 and 2. However, the objects in the box should change to maintain the group's interest. The activity can be shortened by taking fewer turns, i.e., only one or two participants choose an object, but everyone gives their opinion on it.	See table 4.3.	See table 4.3.
Storybook reflection and interpretation 15 minutes	To provide an opportunity for child participants to confirm or change the interpretation of their story. To provide an example of the type of information that can be included in the final presentation to the head teacher. Therefore, aiding the children's understanding of what will happen.	Collate children's pictures into a (PowerPoint) storybook and review it with the group at the beginning of the session. Include the interpretation of children's messages so far, as well as information on how the children made their messages, e.g., using symbols, communication aid, photos etc. Ask children if their messages are right or if they need to change something. Watch carefully for non-verbal reactions to seeing their messages – do they appear to agree with what they see/hear?	PowerPoint presentation. Audio/visual equipment Laptop Video camera Tripod	Video of group interactions Researcher reflection journal Children's personal storybooks in PowerPoint and hard copy
Photograph collaging and discussion. 30 minutes	See table 4.4.	Repeat procedure in session 1 and 2. Children may choose to complete a new collage or add to the one they started last week.	See table 4.4.	See table 4.4.
Feedback and end session 15 minutes	See table 4.4.	See table 4.4.	See table 4.4.	See table 4.4.

Reflection session 30 minutes, post child session.	See table 4.3.	See table 4.3.	See table 4.3.	See table 4.3.
Post sessions	Collate children's collage pictures into a PowerPoint presentation in a storybook format in readiness for group session five.			

Table 4.6: THINK stage - Session five

Activity	Aim/rationale	Procedure	Resources	Research data
Action hero kits. 5 minutes	As above. See table 4.3.	See table 4.3.	See table 4.3.	See table 4.3.
Storybook reflection and interpretation 15 minutes	See table 4.5.	See table 4.5.	See table 4.5.	See table 4.5.
Video message 40 minutes	For children and adults to construct a final message for the head teacher and video it. Using video to capture the message reduces the pressure to 'get it right' in real time.	Each child should now have a message that they have developed over sessions 1- 4. Child and adult dyads can now practice this message in a mode of the child's choice before making a video, e.g., building the sentence on a communication aid, using words and signs. Set-up an area of the room for the children's video message. Allow children to record when they are ready.	Print outs of children's collage/messages from previous sessions 2 x video camera 2 x tripod	Video of group interactions Participant video messages Researcher reflection journal
End session 5 minutes	To provide a summary of the group's activities and what can be expected next week.	Collect the Action Hero kits. Give a simple verbal summary of what the group has done today. Remind participants that next week the head-teacher will watch their video messages. Ask them if there is anyone they think should attend, e.g., class teacher, other class-mates?		
Reflection session 30 minutes, post child session.	See table 4.3.	See table 4.3.	See table 4.3.	See table 4.3.

Table 4.7: ACT stage - session six

Activity	Aim/rationale	Procedure	Resources	Research data
<p>PLANNED⁹ - Final presentation Set up: 15 minutes Watch and feedback: 20 minutes</p>	<p>Having the children's views heard at the managerial level of the school community is felt to indicate a high level of respect for their views. Any suggested changes may be acted on if backed by the head teacher.</p>	<p>Ensure the room is set up with the correct equipment and enough chairs/space etc for the invited audience. The researcher should lead the presentation as the children have not practised giving a presentation at this stage and may find it overwhelming or intimidating. The experience of having your opinion heard by head-teacher and other people from around the school may be a new one and it is helpful if the familiar adults who took part in the sessions are sat with the children to give support and reassurance if required. Researcher to hand out certificates of achievement to child and adult participants and thank them for taking part in the project.</p>	<p>PowerPoint presentation Audio/visual equipment Certificates of achievement</p>	<p>Researcher reflection journal. Children's video messages.</p>
<p>ACTUAL</p>	<p>Having the children's views heard at the managerial level of the school community is felt to indicate a high level of respect for their views. Any suggested changes may be acted on if backed by the head teacher.</p>	<p>Ask each child who they would like to share their story with, in addition to the headteacher. Support their choice-making using a communication page on the school iPad. This will be a grid of photographs and names of people who the children are familiar with, e.g., classmates, teaching staff, therapists, other school personnel such as catering and reception staff. Walk with children to deliver their stories to relevant people. Read the story to the recipient if possible.</p>	<p>Hardcopies of each child's story Communication page on school iPad</p>	<p>Video of group and dyadic interactions. Researcher reflection journal.</p>

⁹ Through discussion with adult participants in the participatory and reflection sessions, it was felt that for this group of children 'video messaging' would not be as meaningful as their tangible storybooks. That is, the adult participants felt that the hardcopy storybook format had more meaning for the child participants who appeared to enjoy reviewing this format throughout the study. Subsequently, session six activity was adapted, and the children decided with whom they would like to share their tangible storybook instead. Table 4.7 details the activity planned before starting the study as well as the actual activity undertaken in light of the adult participants' requested adaptations.

4.6.3 Participant interviews

As outlined in the methods above (4.3.3.), the research would include participant interviews with adults and children who used hi-tech AAC, to address research question 4 and gain a diverse range of perspectives on the viability of the AACtion Heroes approach.

Adult participant interviews

I adapted an interview schedule for semi-structured interviews with the adult participants from the pilot study (appendix L). The questions explored the adult participants' views on the goals, procedures, and outcomes of the AACtion Heroes approach. The first stage of data analysis involved transcribing each interview and ensuring both talk and visible actions were captured. I used continuous line numbering in Microsoft Word to organise the transcriptions. I then used Wengraf's (2001) recommendations for writing verbatim transcriptions with paralinguistic features described in brackets, and memos, to create a rich and extensive log of the raw data (Wengraf, 2001). This would allow me to conduct a latent Thematic Analysis (Braun and Clarke, 2006) of the data using a TNA approach (Attride-Stirling, 2001) which is described in detail in section 4.6.4.

Child participant interview

For the child participant interviews I developed a symbol-based interview procedure based on Talking Mats™ (Murphy, 1998) to ascertain hi-tech AAC user's views on the goals, procedures, and outcomes of the study (see section 4.3.3. for method rationale). The tool provides symbols representing positive, negative, or neutral feelings, for example, like/not sure/don't like; and children are asked to place symbols relating to aspects of their lives in proximity to the feeling symbol that represents their view. This is in addition to any information the child may wish to give using their AAC system or multimodal communication strategies. I included two questions to help child participants talk about their ideas, and if they liked the various elements of the approach. The interview asked the child to visually organize the same symbol cards in two different ways to answer the following questions:

1. What helped you talk about your ideas? (Yes/not sure/no)

2. What do you think about? (Liked it/not sure/did not like)

Symbol cards would then represent the following elements of the AACtion Heroes approach: wearing capes and ID badges, being with (children’s names), being with (adult’s names), being with (researcher’s name), using their hi-tech AAC device, taking photographs, collaging, personal storybook, talking to headteacher. The interview would be video recorded, and the completed Talking Mat™ also considered as data.

4.7. Data presentation and analysis procedures

From the data collection activities planned it was anticipated that there would be a range of different types of data for analysis. This would include video recordings of every AACtion Heroes participatory session (6 sessions); the hi-tech AAC user’s personal storybook (one per child); crib-sheet records of adult reflection sessions (one per session; word processed); observation and reflection research journal (word processed); three videoed and transcribed adult interviews; video of child participant’s interview and photograph of their completed Talking Mat™ (a visual record of their views). As outlined in the data collection and analysis section above, the forms of analysis adopted would include: Video ethnography (Pink, 2013) detailing how participants co-created the storybook (over six weeks); visual interaction analysis (Heath et al., 2010) of moment-to-moment actions within a fragment of interaction (in seconds) to demonstrate co-construction processes; framework analysis (Gale et al., 2013; Ritchie and Spencer, 1994); latent thematic analysis (Braun and Clarke, 2006) using TNA (Attride-Stirling, 2001). Table 4.8. details the data presentation and analysis, and how each corresponds to the participants, data source, and to the study’s four research questions.

Table 4.8. Data presentation and analysis

Research question	Participants	Data source	Transcription (data presentation)	Analysis
1	All child participants All adult participants	Researcher observation and reflection journal.	Original word-processed researcher journal. AAC transcription of video extracts	Video ethnography (Pink, 2013) detailing how participants <i>co-created</i> the hi-tech AAC user’s personal

		Video of AACtion Heroes sessions.	(Higginbotham and Engelke, 2013; von Tetzchner and Basil, 2011).	storybook (over six weeks).
2	All child participants All adult participants	Video of AACtion Heroes sessions.	Visual interaction transcription of fragments of video extracts: Detailed transcription of talk alongside linear 'map' of the onset and completion of actions with video stills (Heath et al., 2010)	Visual interaction analysis (Heath et al., 2010) of moment-to-moment actions within a fragment of interaction (in seconds) to demonstrate <i>co-construction</i> processes.
3	All adult participants	Completed word processed crib-sheets.	Original adult reflection crib-sheets (see appendix M for completed example)	Framework analysis (Gale et al., 2013; Ritchie and Spencer, 1994).
4	All adult participants Hi-tech AAC user	Video of adult interviews (n=3) and child interview (n=1).	Verbatim and paralinguistic transcription of staff interviews (Wengraf, 2001). Photograph of Talking Mat™ from child interview.	Latent thematic analysis (Braun and Clarke, 2006) using TNA (Attride-Stirling, 2001).

4.7.1. Video Ethnography procedure: Research question 1¹⁰

Short-term video ethnography is written in the first-person from the researcher's perspective and developed from the researcher journal and analysis of videoed participant interactions (Pink, 2013). The video ethnography procedure involved reviewing my researcher reflection journal, and the video data, and identifying video extracts that corresponded with the pages of the child's storybook. I revisited the video data using the child's storybook whilst asking myself: How do we know this part of the child's story? What do they do or say to tell us? Thus, each video extract chosen for analysis for the video ethnography is a passage of interaction which corresponds to a page of the child's story. A further fragment of these extracts was analysed using visual interaction analysis to address

¹⁰ In the process of personal storybook co-creation (over six weeks) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?

research question 3 (see section 4.7.2). Figure 5.1. in the following chapter details the video extracts that were identified for both ethnographic and visual interaction analysis. I completed a detailed transcription of extracts of video data that answered these questions using transcription conventions for AAC research developed by Higginbotham and Engelke (2013) and von Tetzchner and Basil (2011) (see table 4.8. for AAC transcription conventions). The process for conducting this type of transcription is detailed below and is designed to capture non-verbal features as well as the natural and synthesised speech that occurs in interactions mediated through AAC. Transcribing specific interactions in this level of detail allowed me to embed accurate participant dialogue into rich descriptions of their interactions within my ethnographic account.

Table 4.8: AAC transcription (von Tetzchner and Basil 2011; Higginbotham and Engelke, 2013)

Feature of interaction	Notation
Naturally spoken utterances	Italicization - <i>Naturally spoken words</i>
Machine-produced synthesized speech	Italicization and quotation marks - <i>“Words and sentences spoken by a machine”</i>
Description of what is involved in building AAC utterance on communication aid	Asterix - *3 button utterance navigating 2 screens
Manual signs such as Makaton	Capital letters – MANUAL SIGN
Simultaneous production of two forms	Waved brackets {PETER <i>Peter</i> } is {NOT <i>not</i> } <i>here today.</i>
Overlapping utterances of two or more speakers engaged in same conversation	Square brackets - speaker A: <i>I'm going [away]</i> speaker B: [<i>where are you</i>] <i>going?</i>
Description of non-verbal actions	Double brackets - <i>It's over there</i> ((points towards door))
Interpretation of ambiguous utterance	Single brackets - <i>Me table</i> (I'll go and sit at the table)

[Adapting AAC transcription for group data analysis](#)

As the main data collection also intended to gather group data, it was important to establish transcription methods that account for group communication. As noted in the literature review (2.4.2.), most AAC interaction studies focus on dyads, that is, the child with a naturally-speaking adult (e.g., Solomon-Rice and Soto, 2011; Clarke et al., 2013; Norén et al, 2013) or naturally-speaking peer (e.g., Clarke and Wilkinson, 2007; 2008; 2009). In these

isolated dyadic exchanges, the AAC transcription conventions (table 4.8.) are sufficient to represent and analyse the data; however, in this study, group conversations were rarely synchronous and linear. For example, an adult and child may converse in a dyadic side-sequence of interaction (Tegler et al., 2020) before giving a required or expected response to the whole group using hi-tech AAC. In this study, side-sequences of interaction frequently overlapped.

Conventionally, square brackets are adequate to indicate when two people are talking at the same time. For example:

Adult A: *They're [books]*

Adult B: *[They're books]*

Although this is clear when two people are engaged in the same interaction, when two or more different interactions simultaneously occur in the same environment, the use of brackets is confusing. Therefore, I adapted the AAC transcription approach (table 4.8.) to allow for simultaneous transcription (table 4.9.). I began by coding simultaneous interactions A, B, C etc, and transcribed them separately, but alongside each other, at the relevant time code (see table 4.9. below). When a communicative turn became relevant across the interaction, I highlighted it in green and repeated in each transcription (see 2 mins 16 secs).

Table 4.9: Simultaneous AAC transcription¹¹

Time	Speaker	Transcription A	Speaker	Transcription B	Speaker	Transcription C
02:04	Laura	<i>Has he got like or don't like on his device?</i>				
02:05	Cai	((walks back to Linda))				
02:07	Linda	<i>He has yeah. Can we say can we tell Laura?</i> ((holds device up for Cai))	Shaun	((stands up next to Moira))	Kate	((holds symbol strip up for Kojo to see)) <i>do you like books not sure or don't like books?</i>

¹¹ The transcription involves 6 interlocutors. Data is drawn from the research study, but used here for example only

02:10	Cai	"I like" *2 button utterance on 1 screen	Moira	<i>What's the matter?</i> ((holding Shaun's arms and looking at him))		
02:12	Laura	<i>You like {books BOOKS}</i>	Shaun	<i>unintelligible</i> (wants to leave the circle)		
02:14	Cai	((Gives picture of books back to Laura and walks away))	Moira	<i>OK</i> ((lets Shaun go))	Kojo	((points to don't like symbol))
02:15	Laura	<i>Thank you</i>	Shaun	((walks out of the circle and into a side room of the class))		
02:16	Kate	<i>((looks at Laura and raises voice)) Kojo said he doesn't like books</i>			Kate	<i>((looks at Laura and raises voice)) Kojo said he doesn't like books</i>

Frequent reviewing of the video data was required to capture these simultaneous side-sequences of dyadic interaction. I began by focussing solely on transcription A using a Microsoft Excel spreadsheet to record non-verbal and verbal communicative actions in detail alongside the time at which they occurred. At this stage, I only transcribed actions which observably impacted on or contributed to, this interaction. I then repeated this process whilst focussing solely on transcription B. If required, I added further time codes to the whole transcription table, for example, if something happened at a specific time code in transcription B that was not relevant to transcription A, I inserted into the first column of the whole table. This leaves a gap in transcription A but ensures overall clarity for the reader. I then repeated this process for transcription C. I watched the video again, taking in the whole interaction and ensuring the transcriptions ran alongside the correct time code. The video ethnographic account is presented in the following chapter (5.2).

4.7.2. Visual interaction analysis procedure: Research question 2¹²

Whilst providing a vehicle to elucidate *co-creation* processes, the aforementioned AAC transcription method used to answer research question 1 was not fine-grained enough to illuminate the details of moment-to-moment co-construction. Furthermore, though it includes descriptions of non-verbal actions, this was not detailed, or visual enough to demonstrate how actions and talk unfold sequentially in a symbiotic manner. Hence, Heath *et al's* (2010) approach to visual interaction analysis is detailed below.

Approach to visual transcription

Using my original AAC transcriptions as a starting point, I drew on Heath *et al's* (2010) visual transcription and analysis methods to analyse fragments of my video data. From this point I will refer to this approach as 'visual transcription' to clarify that this method of transcription is distinct from the AAC transcription described above for answering research question 1. Figure 4.4. shows the various elements I included in the visual transcript. I will use an example from my data to illustrate how I built this transcript in three stages.

¹² In the process of message *co-construction* (in seconds) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?

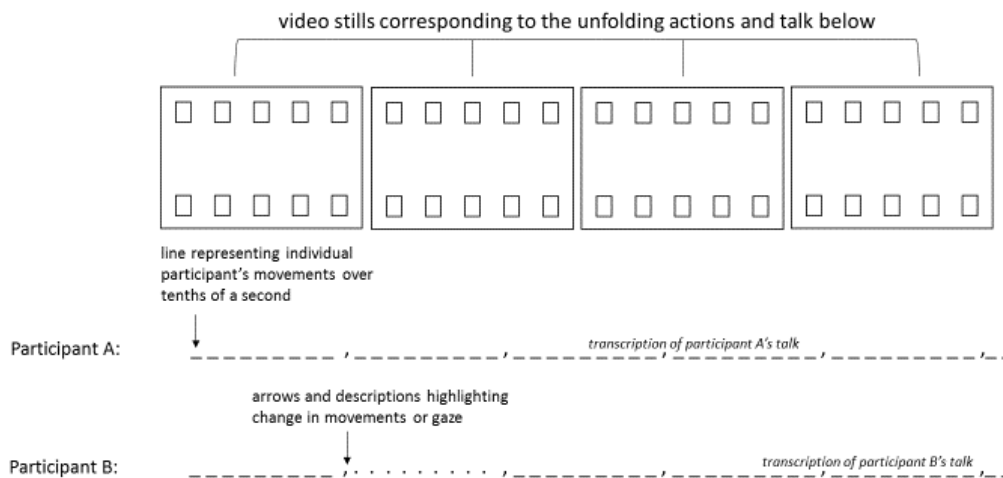


Figure 4.4: Elements of a visual transcript

Stage one: Transcribing talk

The fragments of data used in co-construction analysis were taken from the larger video excerpts used to address research question 1. Though this talk had already been transcribed using AAC notations (table 4.8.) it was necessary to add further detail for the visual transcription. In-depth focus on a few seconds of interaction involves consideration of the nature of talk over tenths of a second. Heath *et al* (2010) draw on a method of transcription originally outlined by Jefferson (1984) for Conversation Analysis (CA) which transcribes features such as length of pauses, whispers or loud utterances, quickening and slowing of pace, changes in intonation, etc (Heath et al., 2010). Additional transcription conventions that capture these features of talk are given below. However, Heath *et al* (2010) do not have notation for synthesised speech, therefore AAC transcription conventions outlined in table 4.9. remain, for example, using quotation marks and italics for AAC utterances: *"I like the library"*. An example is used below to demonstrate how this method (Jefferson, 1984) enabled further details of talk to be layered on to the original AAC transcription (von Tetzchner and Basil, 2011; Higginbotham and Engelke, 2013) using data from this study:

Original dialogue using AAC transcription conventions

Linda *I "I" like "like" go to school school*

Linda *and now places is the library here?*

Cai ((scans communication aid screen)) *lie "library"*

Adding features and characteristics of talk (Adapted from Heath et al, 2010)

Intervals in a stream of talk are timed in tenths of a second and inserted in parentheses, e.g. (1.6) would indicate a gap of 1.6 seconds. A dot in parentheses (.) indicates a gap of less than two tenths of a second.

Li: *"I" (1.5) "like" (.) go to school (.) school (0.1) and now places (2.0) is the library here? (3.0)*

C: *lie "library"*

A colon : indicates the lengthening of a syllable, more colons indicate a prolonged stretch :::

C: *lie: "library"*

Rising and falling shifts in intonation are indicated by up- and down-pointing arrows

Li: *"I" (1.5) "like" (.) go to sch↑ool↓*

Underlining shows where an utterance, or part of an utterance, is emphasised by the speaker

Li: *"I" (1.5) "like" (.) go to sch↑ool↓ (.) schoo:l (0.1) and now places (2.0)*

Bold font is used when part of an utterance is spoken much louder than the rest

Li: *"I" (1.5) "like" (.) go to sch↑ool↓ (.) schoo:l (0.1) and now places (2.0) is the **library** here↑ (3.0)*

A degree sign is used when a passage of talk is quieter than the rest

Li: *"I" (1.5) "like" (.) °go to sch↑ool↓ (.) schoo:l (0.1) and now places° (2.0) is the **library** here↑ (3.0)*

C: *°lie:↑° "library"*

Audible aspirations (hhh) and inhalations (‘hhh) are inserted in speech where they occur

Li: *"I" (1.5) "like" (.) °go to sch↑ool↓ (.) schoo:l (0.1) ‘hhhand now places°*

When part of an utterance is delivered at a faster pace than the surrounding talk, it is enclosed between greater than signs < >

Li: "I" (1.5) "like" (.) °go to sch↑ool↓ (.) schoo:l (0.1) and now places° (2.0) <is the>
library here↑ (3.0)

Therefore, a completed transcription of talk for this type of visual transcription could look like this:

Li: "I" (1.5) "like" (.) °go to sch↑ool↓ (.) schoo:l (0.1) 'hhhand now places° (2.0) <is the>
library here↑ (3.0)

C: °lie:↑° "library"

Stage two: Transcribing visible action

Heath and colleagues (2010) highlight that there is no universally accepted way of transcribing visible actions. Nevertheless, they offer a useful guide on doing so by drawing on the work of Goodwin (1981) as well as their own experience in surgical training research (Svensson et al., 2009) which "involves mapping out the details of the participants' visible conduct in relation to their talk [...] laid out horizontally across the page" (Heath et al., 2010, p. 71) (see table 4.10. for visible action notation). To begin the process, the researcher reviews the video and identifies approximately 3-5 video stills which illustrate changes in the participants' visible actions. The participants' gaze and movements can then be mapped out underneath the video stills in a horizontal, linear manner, with a line dedicated to each participant.

Table 4.10: Mapping gaze and movement (adapted from Heath et al, 2010)

Feature of gaze and/or movement	Notation
Participant is looking at an object	Series of dashes with each dash representing one tenth of a second _ _ _ _ _
Participant is looking at another participant	Series of dots with each dot representing one tenth of a second
Participant is looking away from another participant	Series of commas with each comma representing one tenth of a second , , , , ,
Participant is moving	Continuous line with description e.g. _____ B places finger on page

Passing of seconds within interaction	A single comma within a series of dots or dashes indicates one second has passed, e.g. _____, _____ represents 1.5 seconds
---------------------------------------	--

In accordance with Heath et al's (2010) recommendations, I used graph paper to begin this transcription which proved invaluable as it allowed me to lay out actions spatially in tandem with the transcription of talk (Heath et al, 2010). For example, figure 4.5. shows the original copy of my visual transcript for video fragment D which involved four participants.

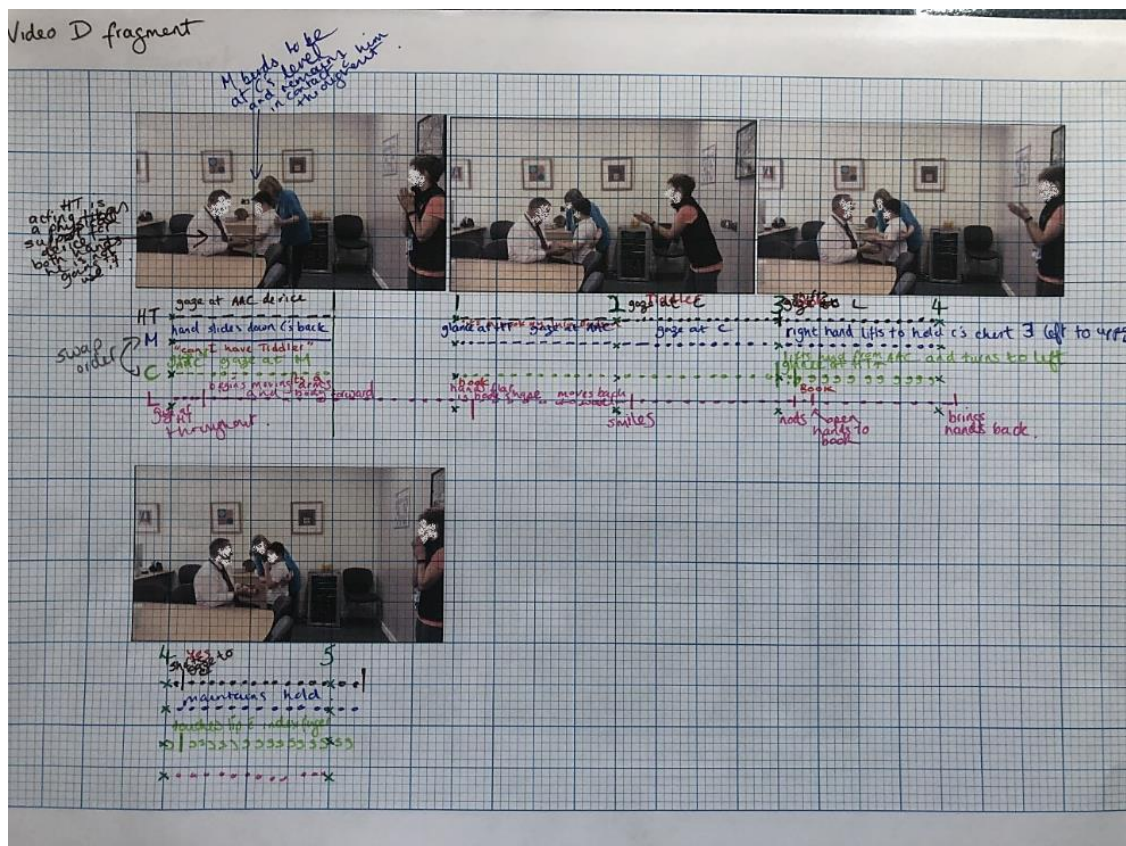


Figure 4.5: Visual transcription on graph paper

Each participant's actions can be mapped separately with extraordinary detail for each tenth of a second. Figure 4.5. illustrates the use of different colours for each participant with every 4cm representing one second, i.e., two small squares/tenth of a second. Once I had completed this process, I laid the transcription of talk on the page at the corresponding time interval. Putting these together made the sequential relationship between actions and talk easier to identify. I then made separate field notes whilst

completing each transcription to aid later analysis. This process demonstrated that elements that were not visible to me on reviewing the video for traditional AAC transcription approaches were extensively illuminated by conducting this fine-grained, visual co-construction transcription procedure. As Heath and colleagues (2010) point out:

transcribing and mapping the participants' conduct in this way enables the researcher to begin to determine the position of particular actions to explore their potential relationship to preceding, concurrent and subsequent conduct, both vocal and visible, of all the participants. It also provides a way of discovering aspects of the action that might otherwise pass unnoticed and to document observations and insights.

(Heath et al, 2010, p. 71)

Stage three: tidying the transcript

Figure 4.5. shows the somewhat 'messy' work of trying to transcribe moving video data on to paper. Heath *et al* (2010) caution that such transcripts are a vehicle for illuminating, not replacing, the data and though are useful to the individual researcher are incomprehensible without access to the original video. Therefore, they recommend including a simplified map with selected features in any published work (Heath et al, 2010, p. 72). For this study, I used Microsoft PowerPoint to create visual transcriptions which include video stills and simplified linear mapping using the conventions outlined above in addition to adaptations relevant for this study (each visual transcription will be presented in section 5.3 of the following chapter). The conventions are described below. In all cases, the video stills were altered to a paintbrush effect to preserve the anonymity of the participants.

Microsoft PowerPoint conventions for this study

Abbreviations for participants' pseudonyms (except my own) are used:

C – Cai (child, hi-tech AAC user)

Li – Linda (AAC teacher)

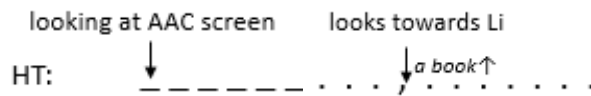
La – Laura (researcher)

M- Moira (LSA)

HT – Head teacher

B – Beth (secretary)

Arrows ↓ are used to highlight points in time where a participant begins to move and are accompanied by a brief description in Calibri font size 14, e.g.,



Participant’s talk is transcribed along the top of their line using conventions described above in Calibri font size 12, e.g.,

The findings of the visual interaction analysis are presented in the following chapter (5.3).

4.7.3. Framework Analysis procedure: Research question 3¹³

The crib-sheet used in the main study was developed from the Thematic Network Analysis (Attride-Stirling, 2001) of pilot study data and was used as an existing framework in a deductive analysis of the new, main study data. Additionally, I wanted to ensure that the beliefs and experiences of the adult participants in the main study were explored without restriction through use of open coding and inductive analysis (see section 4.3.3. for FA rationale). Ritchie and Spencer’s (1994) original description of FA offered a useful starting point to systematically approach the data in five stages: familiarization, identifying a thematic framework, indexing, charting, and mapping and interpretation (Ritchie and Spencer, 1994). However, I also drew on Gale *et al’s* (2013) guide to conducting FA on semi-structured interview data, which employs visual display tools such as Microsoft Excel/Word and NVivo software packages. The detailed process I followed is outlined in the following sub-sections.

Familiarisation with the data

First, I read the crib-sheets in the context of the whole data set: I reviewed session videos, researcher reflections, participant interviews and adult reflection crib-sheets before

¹³ What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use hi-tech AAC and their peers?

focussing on the crib-sheets in isolation. This helped me to create notes as I went through the adult reflections data. I then uploaded the crib-sheets to NVivo 12 to assist my analysis.

Coding

I first used the pilot study themes to deductively code each passage of text from the crib-sheets. When a passage did not fit any of these themes, I created a new code, thereby simultaneously coding deductively and inductively. I also considered if any passages could be interpreted differently rather than assigned to a pre-existing deductive code. Following this initial coding activity in NVivo 12, I revisited the raw data to look for any semantic overlap in coded extracts so that I could refine and distil the codes. Tracy (2019) recommends focusing combined analysis, which she labels *phronetic iterative analysis*, through the use of a formal codebook: “a data display that lists key codes, definitions and examples that help guide your analysis” (Tracy, 2019, p. 221). Creating a codebook in a Microsoft Word table (Appendix N) assisted me in refining and defining my codes whilst considering my research question.

Applying the analytical framework

I applied the emerging framework to each reflection crib-sheet using NVivo 12. This meant systematically going through each passage of text and indexing it to one of the codes. Some extracts did not fit any of the codes, thus, further codes were added, and others collapsed to create a final framework (presented in following chapter table 5.2).

Inputting data into the framework matrix

As recommended by Gale *et al* (2013) I used Microsoft Excel to chart the data using a different sheet for each theme. This created framework matrices for this research. Procedurally, an example of raw data and verbatim quotes was inputted for each code and attributed to an individual participant or group discussion (see appendix O for an example of the raw data in the matrices). NVivo 12 allowed me to retrieve quotes quickly for each code and link them to individual participants or group discussion. I also used a further row in

Excel to keep notes of ideas and thoughts that occurred to me regarding each code as I inputted the data.

Memo writing and metaphors as a means of interpreting data

Themes were identified by reviewing the matrix and exploring the connections within and between participants and codes (Gale et al., 2013). I wrote analytical memos on each emerging theme through organising related codes, considering the themes definition, and summarising the data with illustrative quotations, whilst recording my own interpretation of the ideas and sub-themes that were occurring across the data set. At this stage, I was attempting to go beyond descriptions of the various data sources to look for issues that complemented or contradicted literature I had identified in the literature review.

The adult participants' use of metaphor appeared a succinct and strong indication of how they viewed the experience of participating in the research and often summarised things that were of most importance to them. Idiographic analysis of metaphors that occur organically in qualitative data has been used in organizational discourse (Grant et al., 1998) and has been advocated to understand the unconscious ways that people view their world (Tracy, 2019). I identified four metaphors in the data and created a table of codes which related to them (Appendix P). I then used free writing to explore each metaphor and its related codes. I hoped that writing in this way could further elucidate what the adult participants viewed as important contributions from them to the process of storybook co-creation, through further structuring the research data, and potentially convey a richer meaning to the reader when writing-up my interpretation and discussion of the data. The findings of the FA are presented in the following chapter (5.4).

4.7.4. Thematic Network Analysis (TNA) procedure: Research question 4¹⁴

I conducted a latent thematic analysis (Braun and Clarke, 2006) of the adult and child interview data to inductively capture a range of participants' views in relation to the experience of participating in AACtion Heroes and the viability of the approach in the special

¹⁴ Is co-creating children's personal storybooks (AACtion Heroes) a viable way of working with children who use hi-tech AAC in the special education setting?

education context (see section 4.3.3. for rationale). I used the six-stage TNA approach for thematic analyses and representation of data through thematic networks outlined by Attride-Stirling (2001). The procedure I followed is detailed below.

Stage 1 – Code material

I used qualitative software NVivo12 to upload the three interview transcripts from the adult participants and the image of the child participant's Talking Mat™. This assisted me in dissecting the transcripts/image into meaningful segments, and I created codes based on the issues that arose in the data. However, I approached the analysis with the research question in mind and subsequently created codes that related to the viability of the AACtion Heroes project as something that could be used (or not) with children who use AAC in a special education context. I used NVivo 12 to create a codebook of the resulting codes and used this as a coding framework to revisit the data and further dissect the text (Appendix Q).

Stage 2 – Identifying themes

Using NVivo12, I revisited the images and text segments which were now abstracted from the main text and Talking Mat™. This allowed me to identify common patterns which became basic themes; simple premises or lowest-order themes in the data (Attride-Stirling, 2001). I used a Microsoft Excel spreadsheet to; list the basic themes, write a succinct definition for each one, and write a memo containing my initial thoughts and ideas about each theme (Appendix R). I then used a further sheet in Excel to organize the basic themes into clusters of similar issues or ideas. I refined the themes by describing the clusters in more abstract terms which encompassed a significant idea in the data whilst avoiding repetition and overlap between themes (Attride-Stirling, 2001). These became organizing themes; middle-order themes whereby one organizing theme represents a cluster of basic themes, but several organizing themes provide the warrant for a significant - global - theme in the whole data set (Attride-Stirling, 2001).

Stage 3 – constructing the networks

Using Microsoft Excel, I restructured the organizing themes and their accompanying basic themes into common issues that formed the basis of a global theme. I then used NVivo12 to cross reference the original Talking Mat™ image and passages from the text to the new global themes to check if the ideas were still coherent within this restructuring of the themes. I then illustrated the global themes as distinct but “non-hierarchical” (Attride-Stirling, 2001, p. 393) thematic networks using Microsoft Word.

Stage 4 – describe and explore the thematic networks

I described each network in turn by discussing each organizing theme with original extracts from the interview data. I structured these descriptions in a sequential order reading from the top right of the network in a clockwise direction to aid understanding of the material for the reader (Attride-Stirling, 2001). These findings are presented in the following chapter (5.5).

Stages 5 and 6 – summarise the thematic network in relation to existing theory

Themes were summarised and related to the existing literature and theory in the field with specific reference to research question 4. This discussion will be presented in chapter 6 (6.4).

4.8. Chapter summary

The main study aimed to explore the consequences and potential of taking a child-led and participatory approach to hearing the views of children who use hi-tech AAC in an everyday special education setting. Specifically, it aimed to explore the macro and micro processes of interactions mediated through hi-tech AAC whilst participants were aiming to be child-led, identify what adult contributions were important, and examine if taking a novel, participatory approach was viable in an everyday special education setting. Consequently, methods were chosen to reflect the varying requirements for answering the four different research questions. The following chapter details the findings of the four data analysis approaches which correspond to each research question. Whilst some interpretation is

required to present the findings coherently, detailed discussion of the findings in relation to existing literature and theory will be presented in Chapter 6: Discussion.

5.0. Chapter 5: Presentation and Interpretation of Findings

5.1. Introduction

This chapter presents the findings of the data analyses corresponding to the study's four research questions. For clarity, I will now restate the research questions:

1. In the process of storybook *co-creation* what talk, visible actions, and material artefacts are observable in interactions mediated through hi-tech AAC?
2. In the process of message *co-construction* what talk, visible actions, and material artefacts are observable in interactions mediated through hi-tech AAC?
3. What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use hi-tech AAC and their peers with CCN?
4. Is co-creating children's personal storybooks (AAction Heroes) a viable way of working in a special education setting with children who use hi-tech AAC?

5.2. Co-creating a personal storybook with a child who uses hi-tech AAC: a video ethnography

Research sessions were planned to take place over a six-week half term, with group activities involving a minimum of 3 children and adult support staff (see tables 4.3 – 4.7). However, the sessions did not always go to plan: the school could not accommodate starting the sessions at the start of the school term so the 6 sessions could not run consecutively; individual participants were not always present for each session meaning group activities were not always possible, and one child, Kojo, withdrew assent from the study after the third session in favour of going to his music lesson. Table 5.1 shows which participants were present in each AAction Heroes session.

	Session 1	Session 2	Half Term Break	Session 3	Session cancelled for Sports Day	Session 4	Session 5	Session 6
Participants present Children Adults	Cai Shaun Kojo Linda Moira Kate	Cai Shaun Linda Moira Kojo Kate		Cai Shaun Linda Kojo Kate		Cai Moira	Cai Shaun Linda Kate	Cai Shaun Linda Moira
Participants absent		Kojo opts to go to music room. He takes photographs of his favourite musical instruments and remains in music lesson for the second half of the session (accompanied by Kate)		Kojo opts to go to a quiet room for second half of session and is accompanied by Kate (there was no music lesson that day) Moira is acting teacher with other children (not participants) elsewhere in school		Kojo in music lesson accompanied by Kate Linda off sick Shaun on holiday	Kojo in music lesson with another LSA (not a participant) Moira off sick	Kojo in music lesson accompanied by Kate
Researcher's contact with parents/guardians				Researcher gives Kojo's storybook to his parents (in person) which includes his preference for music lessons. Agree Kojo will attend music not AAction Heroes		Researcher discusses Cai's storybook with his mother (in person)		Researcher sends Shaun's storybook home and discusses his preferred activities with guardian (phone call)

Table 5.1: AAction Heroes sessions attended by child and adult participants

This section of the findings is a first-person account of how participants co-created a storybook with a child who uses hi-tech AAC, Cai¹⁵. The ethnographic account is structured around a material artefact from the study, i.e., it corresponds to each page of Cai's storybook. Where necessary, images from his original story have been removed or adapted to maintain anonymity of the participants. Cai took photographs of books 'Ten In The Bed' (Dale, 1998) and 'Tiddler' (Donaldson and Scheffler, 2016) which he used in his storybook. Descriptions of the setting, the participants' interactions including their talk, visible actions and use of material artefacts are developed from my researcher journal and audiovisual recordings of the research sessions and AAC transcriptions of the video data (Higginbotham and Engelke, 2013; von Tetzner and Basil, 2011). The excerpts of video chosen to correspond to Cai's storybook are shown in figure 5.1. and detail the duration of footage analysed to address research question 1 and 2. Footnotes are used throughout this ethnographic account to indicate which interactions underwent further visual interaction analysis to address research question 2. However, the visual interaction analysis corresponding to the footnotes will be presented in the following section 5.3.

¹⁵ All participant names are pseudonyms.



The school was a large modern building with wide, well-manicured external paths that curved and converged at the main reception. All pupils, parents, staff, and visitors were required to enter there, but two sets of wide automatic doors ensured it never felt crowded or inaccessible. The doors opened into an expansive foyer with vast floor-to-ceiling windows. A suspended walkway allowed pupils upstairs to call down and say hi to Reception staff on their way to class. To the right and left were large, automated doors which led to classrooms, but directly in front was a café which could be used by staff, children, and visitors alike. In fact, it reminded me more of a modern hotel than any school I'd worked in before. The reception desk had an iPad for 'checking-in' where you were required to put in your personal and professional details, as well as the person you were meeting, and the system would automatically send them an email saying you had arrived. About seven feet up, flat-screen TVs silently scrolled videos and photographs of the pupils' work and projects for visitors to peruse as they sat in the waiting area. Sitting in the centre of the foyer, the only place for visitors to sit, it felt like an inverse theatre-in-the-round. Though class had officially started by the time I arrived, this central hub was still busy. Nurses and therapists darted in and out of several doors with children who were being taken out of class for

various therapies and treatments. Late-comers turned up with apologetic parents, perhaps they had attended a doctor's appointment, perhaps they just couldn't get going that morning. All reasons were met with a wave of the hand and a smile and another staff member quickly arrived to greet the child and take them to class.

Linda arrived. Invariably 5-10 minutes late, but she always eventually bounded with energy and enthusiasm from one of the doors. Linda is a specialist teacher for children who require AAC and was my main point of contact in the school throughout the pilot study and the main study. She is around my height, we have a similar short, asymmetric haircut. Though perhaps older with more professional experience than me, she always talked to me as an equal and listened with interest to my ideas. She spoke quickly in an upbeat rhythm as if to assure her listener that the story had a positive outcome. That day, there were staffing shortages in class and their usual timetable had been disrupted, but the children were ready and waiting for the session to begin. Linda located her key card and we were admitted entry into the corridor. She led me to the children's classroom, left here, right there and talking all the while. Even after 6 weeks I couldn't have found my way through the maze alone.



The classroom held on to the faded scent of toast and antibacterial cleaner. A large white fridge stood in the corner with lists of what I assumed to be medicines and dietary requirements for the children stuck to the front. There was a sink and worktops around the right-hand perimeter with cupboards at knee and head height. Soap and hand towel dispensers were dotted around the room along with white plastic bins containing canary-yellow clinical waste bags. The only desks were large tables pushed together in the middle of the room to make a hard, white island. The walls were lilac, but so pale a lilac they could have been white. You may be familiar with the technicolour wall displays in mainstream schools; every conceivable space mounted with the children's creations. Not so here. The walls were plain and unadorned. The utilitarian floor was a wipe-clean grey and matched the moulded plastic chairs provided for staff and pupils alike. Taken together, these elements should have made the room feel clinical rather than educational. But it just wasn't. A huge window ran the length of the room's exterior wall with an automatic door leading out into a small, fenced-off playground only accessible to this class. There was hopscotch and a maze painted in primary colours on the spongy tarmac. A box of trains spilled out on the ground. Discarded chunky chinks and cars suggested fun and games. Large clear boxes

were stacked along the left side of the classroom filled with bright toys and clearly labelled with a photograph and description of their contents. Coloured pencils, pens and paper were strewn across the desk, and if you ventured to look carefully, along the floor as well. There was a strip of symbols running down the side of the whiteboard depicting the class schedule for the day. The large flat-screen TV was currently rolling a display of smiling photographs of the children. Although there were some files dotted around the worktops, there was no desk for the class-teacher. The only thing that set their place apart at the central communal island was an office chair. There was a door to each corner of the class; three small rooms available for work with one pupil or a small group, and one which linked to the classroom next door.

The class was empty save for five people; Learning Support Assistants (LSAs) Moira and Kate, then three boys all aged between 8 and 11; Cai, Kojo and Shaun. They were sat in a semi-circle facing the flat screen TV, waiting for me to plug in my laptop and review what we did last week. I began to set up the video camera and Shaun smiled, leaping to his feet.

“S’it got ‘nuff charge?” he said, taking the camera from my hands.

Moira intervened, “leave it alone Shaun.”

“It’s fine,” I smile at Moira.

“Well he’s putting his finger on the lens,” she replied.

I jolly along, “Help me with the tripod Shaun!”

Shaun put the camera down and helped me tighten the legs of the tripod. Each week he remembered a little bit more of what to do but his concern about how much charge was left in the camera, or indeed any electrical device, never waned.

Kojo was unconcerned with any of it. He leaned back on his chair which was designed to rock slightly so he could do this without risk of injury. His eyes looked up to the ceiling and then glanced left at Kate. Kate smiled back at him, unconsciously tapping her foot on the floor.

“Music,” he said. “Music. John”

“Not now Kojo”, said Kate, “it’s Action Heroes now with Laura.”

Kojo was unimpressed, “uh mu uh mu music John.”

I looked up from fiddling with the camera and tripod. Kojo browsed through his PECS book as Kate looked on expectantly. His book contained around 6 pages, with 8-10 symbol cards velcroed to each page.

Kojo found the symbol for music and handed it to Kate, "Music. John." Kojo looked around the group, stretched and yawned widely. Kate and I looked at each other.

"He's made it pretty clear that he wants to go to music", I said, "he took pictures of the music room and John last week."

Kate smiled apologetically, "Yeah, he does normally have music with John at this time and I think he misses it. I can probably distract him though and he can carry on with your session."

I could see that Kate was concerned the session may not go according to plan if we let Kojo go to music but that sort of missed the point of the whole approach.

"The whole thing is meant to be child-led and optional, so it feels a bit wrong to ignore what he's saying?" I addressed this to the whole group but only the adults nodded in agreement. Kate took Kojo to his music class.

Eventually I managed to get the children's 'story-so-far' up on the screen. I had abandoned trying to show them video footage the previous week as it would not load on the school's computer system. Even in this school with its myriad of technological resources and systems for learning, frustrations over IT compatibility abounded. Although there were no videos, the storybooks included video stills of the children completing activities in previous weeks, as well as their own photographs and collages.

Cai looked at his storybook intently. He got up and touched the screen, hummed and vocalised. He was always moving. He stepped from the screen, to Moira, and back to his own chair, and round again. When we looked at Shaun's storybook Cai lost interest and walked around the classroom. He delicately touched objects as he walked past; the edge of a desk, tissue jutting out of the dispenser, the misaligned book in the row, the loosened corner of a wall display; he stopped and tapped the cupboard door where the snacks lived.

Moira smiled but was firm: "No you can't have your snacks now Cai, its Action Heroes with Laura". In my head I considered the consequences of letting Cai have his snack whilst watching Shaun's story. Cai might sit down and look at his classmates' story, but

Moira would not appreciate me contradicting what she just said. I said nothing. We could reflect on it later.

Page 2: My favourite place in school is the library because I love books



We didn't sit for long looking at the children's stories. Moira and Kate had previously impressed on me the importance of keeping activities short - no longer than 10 minutes - and active, for instance by moving to a different area of the classroom for each activity. Cai and Shaun appeared to appreciate the break and they both got up, moving to different ends of the classroom, whilst Linda, Moira and I set up. I began the next activity by holding up a large choice board with symbols on it and telling the group: "We're going to decide which place is important to us in school." All three adults sat down and were followed by Shaun and Kojo. Cai hovered behind the semi-circle of chairs. I continued with the activity and didn't try and persuade him to come. I was hoping that he might join in if he was allowed to watch for a while. I went through each symbol so that the children understood what choices were available to them. Linda and I had compiled these symbols during the pilot study, so, in addition to typical classrooms such as Design Technology (DT) and music room, I had rooms specific to this school, such as the trampoline room and, my personal favourite, the

'holodeck'. This nod to Star Trek described the futuristic room where you could project anything on to all four walls, creating whatever virtual space you could think of.

I had felt positive I was prepared for this session. But alas, options are no good if the children are unaware that they exist, and the conversation moved on to renegotiate what was available.

"Don't go to the DT room, do we?" said Kate.

Moira looked at me shaking her head, "No not at this key stage"

"No, you don't go there?" I said and glanced from Moira to Kate. "That's ok, uh the trampoline?" I stretched my head over the top of the board scanning the upside-down symbols and pointed to TRAMPOLINE.

Shaun smiled and turned to Moira, "Yeah!"

As this renegotiation unfolded, Cai stood a metre or so behind the group switching his gaze from the classroom wall to the symbol board whilst rocking a chair back-and-forth. In one moment, he brought his right index finger to his lips and walked into the circle. He stood in front of the symbols, occluding Shaun and Moira's view of the board and flicked one of the symbols with his left hand.

Linda craned her neck but couldn't see the board properly. "What's he pointing to?" she asked nobody in particular.

Moira was sat next to her, "the library."

Linda and Moira smiled at each other in shared recognition, "the library."

Linda caught Cai's gaze, "The books" she nodded, "the books are in the library."

Cai used a soft affirming vocalisation and walked towards Linda.

Though I tried to show Shaun his choices, I was mindful that Cai had chosen both to join the group, and to express his views. I wanted to acknowledge this, whilst keeping my focus on Shaun.

I looked around the group resting my gaze on Cai. "The library, we know where you like Cai" I smiled at Moira, "he likes the library". I shifted my body to face Shaun again, but he turned to speak to Moira. Moira picked up on this instantly, redirecting Shaun.

"Listen!" she said, and pointed in my direction.

Shaun did listen. He patiently listened to the choices and finally came back to the trampoline, a firm favourite. Meanwhile, Linda and Cai were engaged in a side-sequence of interaction parallel to the group discussion and were co-constructing a sentence on Cai's communication aid¹⁶. I was aware of this, but it did not distract me from the group conversation. Remarkably, it didn't seem to distract the others either, they seemed familiar with this kind of side-interaction in the classroom: everyone else remained focussed on the symbol board and my questions. It was Cai's turn to answer now. He stood next to Moira, pulling her arm to encourage her to stand up.

I turned my chair, "Where would you like to go Cai?"

Linda picked up his Cai's VOCA and held it to his right. Linda, Cai and I all looked down at the screen.

"I think you've been telling me, haven't you?" I say, "but I've been talking to someone else".

Cai replied through his VOCA "*library I like reading,*" but glanced at Moira not me.

I smiled and looked at Cai, "You want to go to the library because you like reading."

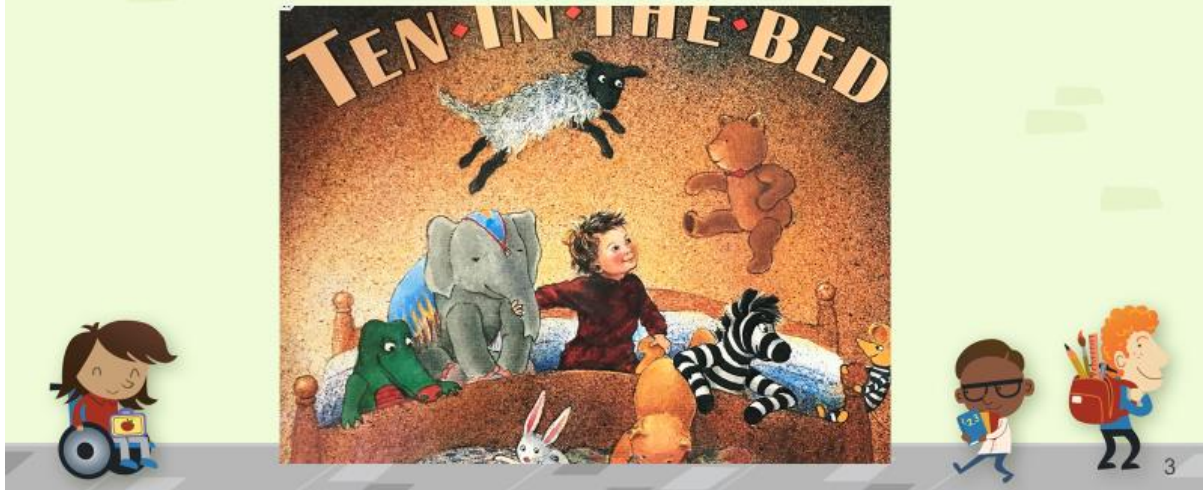
Cai glanced at my face.

I gave him the thumbs up, "That's an excellent choice."

For weeks to come I find myself wondering about Linda and Cai's side-sequence of interaction. It was a separate conversation between the two of them but later allowed Cai to contribute to the wider group discussion. Yet while it meant that Cai could take his turn in the group using a sentence, it also meant he did not listen to the contributions of his peers.

¹⁶ Visual interaction analysis of co-construction to follow in section 5.3.1.

My favourite books are by Julia Donaldson. I like all of her books. But, there is a BIG copy of 'TEN IN THE BED' in the school library which I really like.



The library was upstairs. Cai led the way, striding purposefully towards his destination and turning occasionally to make sure we were following. Shaun took charge of opening doors using Linda's key fob. He stood up straight, holding each door open for us to pass through, then ran ahead of the pack in time to open the next door. The staircase curved up to the walkways above. As is popular in many modern public buildings, the use of brushed aluminium rails and clear Perspex panels gave the impression that both stairs and walkways were floating. Cai took one step up but stopped suddenly so that I almost walked into his back. He turned and briefly looked at my face, then at the banister. He tapped the rail three times and looked down at my hand. I nodded and obeyed, held the rail, and mirrored each of Cai's careful steps upwards.

We all entered the library. A familiar room, like many school libraries I have visited. Cosy nooks are fashioned using bookshelves as partitions and large comfortable beanbags or child-size sofas are installed in each nook. Cai was visibly calm now. No longer rocking back and forth or vocalising; he appeared to have a focus. He made his way to the far left corner of the library and opened a door. Shaun and I followed but Cai didn't pay any attention to either of us. We entered a dark, walk-in cupboard. Numerous hanging folders

held large books, and boxes of story-sacks obscured the floor, all intended for group reading activities. Cai flicked through the folders like he was searching the bargain rail in a clothes shop. I watched with interest. Moira tried asking Cai which book he was looking for, but he did not look up, just continued his search. Finally, he found his target, 'Ten in The Bed'. He hauled the folder off the rail and skipped past me smiling, placing the book down on the first beanbag he came to. I kneeled next to Cai as he wrestled with the pages to find the beginning of the book. Linda stepped in and gave Cai a school iPad so that he could take a picture of his favourite book. Cai held the iPad, I navigated to the camera app, and Linda held the book up with two hands in readiness for a photograph. But Cai began scrolling through the photos on the device.

"Oi cheeky!" said Linda "there's all sorts of stuff on there!"

Cai smiled and returned to the camera app. Linda held the book again and I noticed Cai took time to zoom in on part of the page before taking the image. Satisfied that he was more than capable of using the camera app independently, Linda rested the book on the beanbag and we both stood up.

Linda warned me "He's gonna take a photograph of every page."

"Fab" I said, but Linda still seemed reticent.

"OK?"

I watched Cai turn another page and answered Linda, "perfect."

Linda and I continued to negotiate the extent of Cai's freedom and who would take responsibility for it.

"OK and I'll send them all to you?"

"Yep, that's absolutely perfect" I replied, "Well done Cai".

Linda and I moved away and left Cai to it.

"Uh te!"¹⁷

Cai's shout made me spin around and return to his side, "Teddy?". I looked for clues on the page as to what he might mean. But that wasn't it. Cai's voice took on the soft timbre of a lullaby.

¹⁷ Visual interaction analysis of co-construction to follow in section 5.3.2.

“Yeye tay.”

I understood and sang the response, “And the little one said.”

Cai’s turn. He swayed back and forth, “Row row”. Roll over, roll over.

We continued this call and response rhyme, slow and steady as Cai turned the pages.

He did take a photograph of every page. All the way to The End.



There had been a half-term break between sessions two and three, so it was almost two weeks since I saw the children last. I wondered if they had forgotten about me and what we had been doing in the group. I walked into the classroom laden like a packhorse with kit; camera, tripod, large box of session resources, rucksack with diary and notepad, laptop and every connecting cable I owned. There were around 7 children in the classroom. Usually, the rest of the class were in music lesson, but it was not running that day. Cai stood reading a book at the table and did not look up. Kojo and Kate sat on chairs facing each other. I couldn't see his face because his head was almost in his lap, he stamped his feet and slapped Kate's knees with both hands. She stroked his arms with a look of calm concern across her face. Shaun beamed and bounded towards me, distracting me from everything else. He helped me take my tripod carrier bag off my shoulder. Whilst I pottered around setting up the laptop, camera and other resources Shaun took the tripod out of the bag and started to lay-out all the poles and various attachments. Moira darted across the back of the classroom in pursuit of a child running to the bathroom but was still able to eye Shaun.

"He might break that so keep an eye on him!" she warned.

I held back a sigh and remained cheerful, “It’s OK I’m happy to have his help.” Shaun and I built the tripod together and again I reassured him that there was plenty of charge in the camera.

There was no class teacher that day so, as the most senior LSA, Moira had been acting as the teacher. Moira had a lot to do in the classroom and was trying to get everything done at lightning speed whilst giving out brief instructions to other staff members. Eventually, Moira and another LSA left the classroom with the children who were not participating, and I got ready to start the session. Kojo stayed close to Kate whilst I started the session. Eventually, he stood up, took Kate’s hand and they moved past me to the quiet room, a separate room to the right-hand side of the class, simply furnished, with plain white walls and two large bean bags. Linda and I decided to carry on the session with just Shaun and Cai. Today, in our third session, we were using the photographs that the children had taken themselves in the previous session to make a collage. There was also an option to draw if they preferred. I handed a coloured envelope to both Shaun and Cai containing their images. Cai immediately took his to the collaging table and looked at every one with interest. Shaun looked at the first one. It was him smiling in front of the trampoline, “Grampoline selfie!” he sounded excited, but he put the photos down and retreated to a room at the far left of the class. He started pumping up footballs with an electric pump, an activity which Linda assured me he found relaxing. I left him to it.

Linda was talking to Cai about his photographs and trying to prompt him to use his VOCA¹⁸. I stood back and watched these separate activities simultaneously happening across corners of the classroom. There was a familiar knot in my stomach that I took time to question. I had planned this group activity; all the children and adults would sit together at the table, drawing or sticking photos, discussing our choices as we completed the collage. There would be symbols for the children to use to help them convey their ideas. It worked well in the pilot study! I took a deep breath and tried to go with the flow. It was not the first time my session plan had changed. I reconciled with the fact it wouldn’t be the last. Cai stood alone at the table. He hummed and flicked through his photographs. I wondered if Cai had made any choices about which images to use in his collage and approached the

¹⁸ Visual interaction analysis of co-construction to follow in section 5.3.3.

table to have a closer look. He stuck a photo of the front page of 'Tiddler' down and seemed to be deciding between two photos, alternately waving and looking at each one.

"Shall we stick them on?" I asked him¹⁹.

He gestured to one of the images.

We put the glue on together, Cai moving the glue stick whilst I held the back of the photo up firmly. "Where would you like to put it on here?"

Cai placed the picture to the left of the page.

"There," I say as we both smooth the photo down, "It's a crocodile."

Cai picked up the next photo, "wewa" he said, and I agreed.

"That's a zebra. He fell out of bed!" I started singing, "and the little one said," but Cai didn't sing back.

He looked at the photographs on his collage with mild concern and walked away. I assumed he had finished, and I didn't try to bring him back.

Cai walked to the back of the classroom. There were drawers of removable trays in various colours which contained the classroom resources such as coloured paper and scissors. Cai didn't open them but walked back and forth, running his hand along the surface of the trays. Perhaps he liked the sensation; perhaps he found it calming? I went into the side room to see what Shaun and Linda were doing.

Shaun and Linda were all smiles. They were looking through Shaun's photographs. He loved to use scissors and was cutting around some of his images but was having trouble sticking them on because the glue stick wasn't very sticky. He and Linda had a good laugh about the rubbish school glue. I sat next to Shaun and looked at his collage. Linda glanced out of the door into the main classroom.

"What is he looking for?" she asked me, whilst staring at Cai.

He wasn't just touching the front of the trays anymore; he rummaged around in one of them and found what he was looking for. Sellotape! He struggled to find the end for a few seconds then brought the roll to Linda. She gave him a strip and he moved away. He paced the length of the classroom and went outside to do laps of the play area, gently

¹⁹ Visual interaction analysis of co-construction to follow in section 5.3.4.

touching the strip to his nose, one side and then the other. Linda and I looked on, slightly bemused. But then Cai established which side was sticky, returned to his collage and stuck the edge of his photo down. Linda and I glanced at each other smiling in a shared moment of respect for Cai: what a great problem-solver!



Cai is one of the most resourceful people I have ever met. His face rests in a calm, angelic expression and although his eyes rarely meet other people's faces, they are constantly observing events as they unfold, apparently storing information which may (and frequently does) prove useful. We were in the library again at his request. There was another group of children here from a different class, so I couldn't set up the camera this time. I watched Cai, knowing that I'd need to remember and write-down anything interesting without my video footage as back up. He marched to a bookshelf by the window. Moira was watching me watching and mouthed "Julia Donaldson books" across the room, letting me know what Cai was looking for. Cai rocked back and forth from one leg to the other. He seemed agitated. He pulled out one book, then another, then another, they dropped to the floor. Linda approached him holding his VOCA and asked him what he was looking for. He navigated through folders of vocabulary on his VOCA to a page of book titles. What he was searching for was not there. He picked up a discarded book from the floor and turned to the back page, but it was blank. He picked up another, and there was a page listing 'Other titles available in this series' which he scanned, dissatisfied. Moira watched him and suggested he

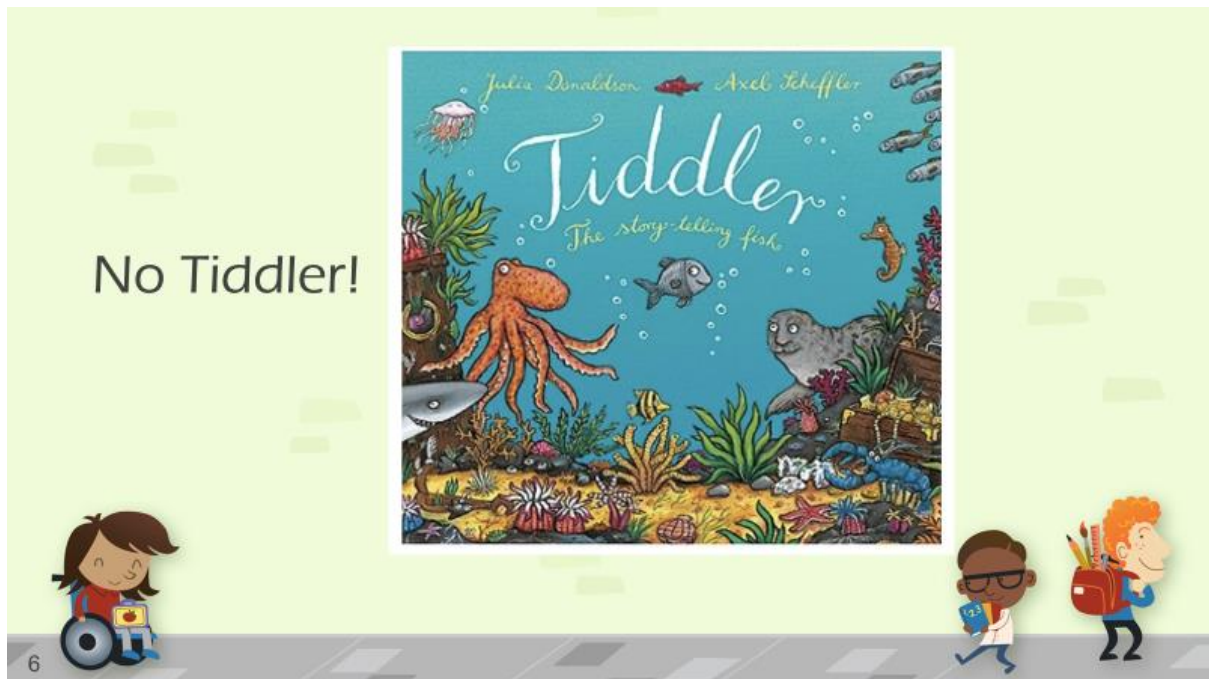
was trying to tell us about a Julia Donaldson book that wasn't in the library. Linda used Cai's VOCA to internet search images of 'Julia Donaldson books' and handed the results to Cai.

He scrolled through, and with a smile of recognition said, "Tidi!"

Moira, Linda and I all looked at the screen, Tiddler! Linda added the image and title to the page on his VOCA immediately.

Moira shifted her weight from her left to right leg and put her hand on her hip, "I'm not sure that should be on there, we don't have Tiddler in school and we get behaviours if he can't have what he wants."

A micro-expression of incredulousness flashed across Linda's face.



“Perhaps this is what he could speak to the headteacher about?” I offered. “Part of the remit of the project is exploring things the children think could be better about school and putting those suggestions to the headteacher.”

Linda nodded and looked at Moira, “new book for the library?”

Thankfully, Moira thought this was a great idea. She helpfully suggested that we ask today so that Cai understood the link between showing us *Tiddler* isn’t here and asking the headteacher who could change that. Both Linda and Moira agreed that the headteacher would be happy to see Cai straight away if he was in his office. A child can interrupt anything he is doing; staff need to make an appointment! Linda and Cai knelt on the floor and began constructing a sentence on his VOCA.

“*Can I have...*” Cai scanned the book titles page and smiled, “*Tiddler.*” He pressed the sentence window, “*Can I have Tiddler?*”, “*Can I have Tiddler?*”.

In great procession, we approached the headteacher’s office, Moira and Cai leading the charge with Linda, Shaun and myself behind. Cai clutched his VOCA in anticipation.



Linda knocked on the office door. The headteacher was sat at the far end of a huge oval table with two school governors. It was a bland, beige office with few personal items on view. Standard-issue geometric art on the walls gave it the look of every other public sector meeting room you may have visited. A glass-fronted fridge full of bright red Coca Cola cans sat incongruously against the back wall. The headteacher stood up and towered above Moira and Cai, who were entering the room. Nevertheless, the headteacher wore a broad and welcoming smile which made his stature seem protective rather than threatening. Moira ushered Cai in holding his shoulders and the corner of his VOCA, giving the impression Cai couldn't manage the weight of it. The headteacher sat at the opposite end of the table now so that Cai could approach, and they would be the same height. He held out his arms so that Cai could rest his VOCA down. Now Cai's hands were free to speak²⁰.

"Can I have Tiddler?" he asked.

Moira leaned in and whispered toward the headteacher, "it's a book by Julia Donaldson".

²⁰ Visual interaction analysis of co-construction to follow in section 5.3.5.

The headteacher heard Moira, but maintained his gaze at Cai, "Tiddler? A book. Yes."

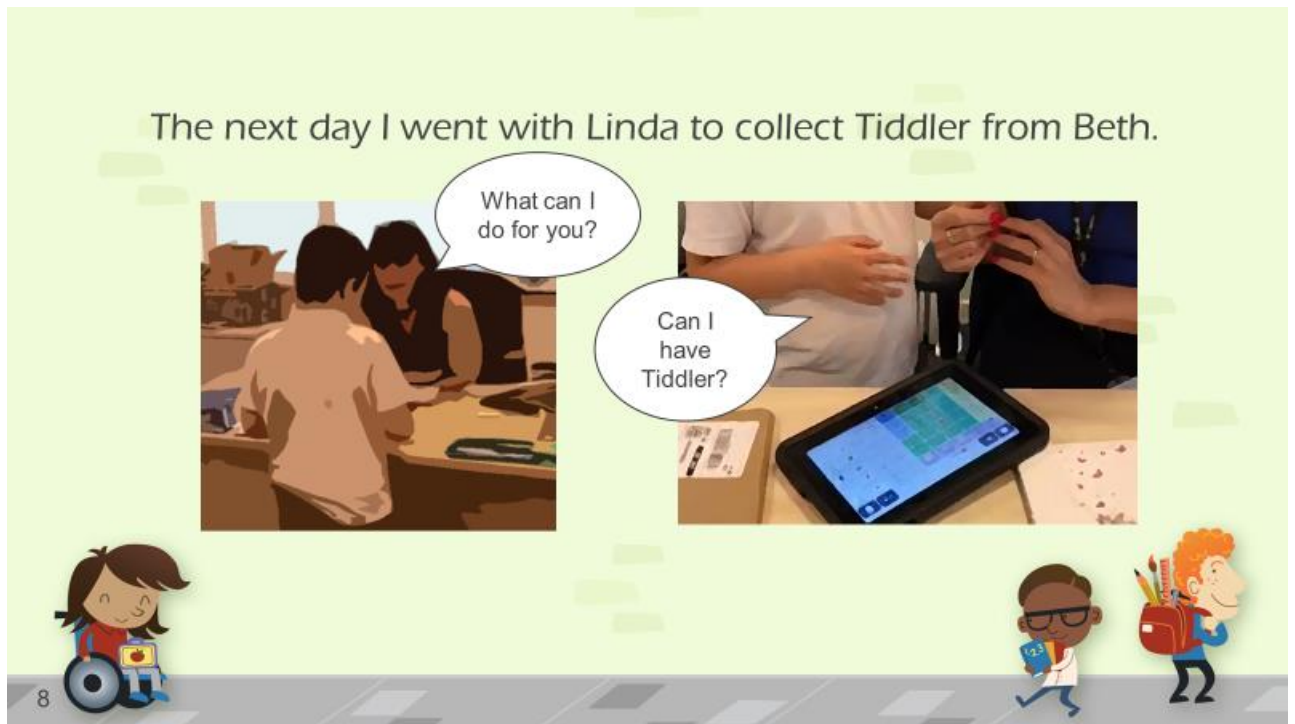
"Is it a favourite book?" the headteacher tried to maintain the conversation and Cai scrolled through some vocabulary on his device as if he may answer but Moira intervened with another question.

"Can you say thank you?"

Cai interpreted this as a cue to leave. He whispered "bye" at the headteacher and bounced out of the office pressing the sentence window on his VOCA, "*Can I have Tiddler? Can I have Tiddler? Can I have Tiddler?*"

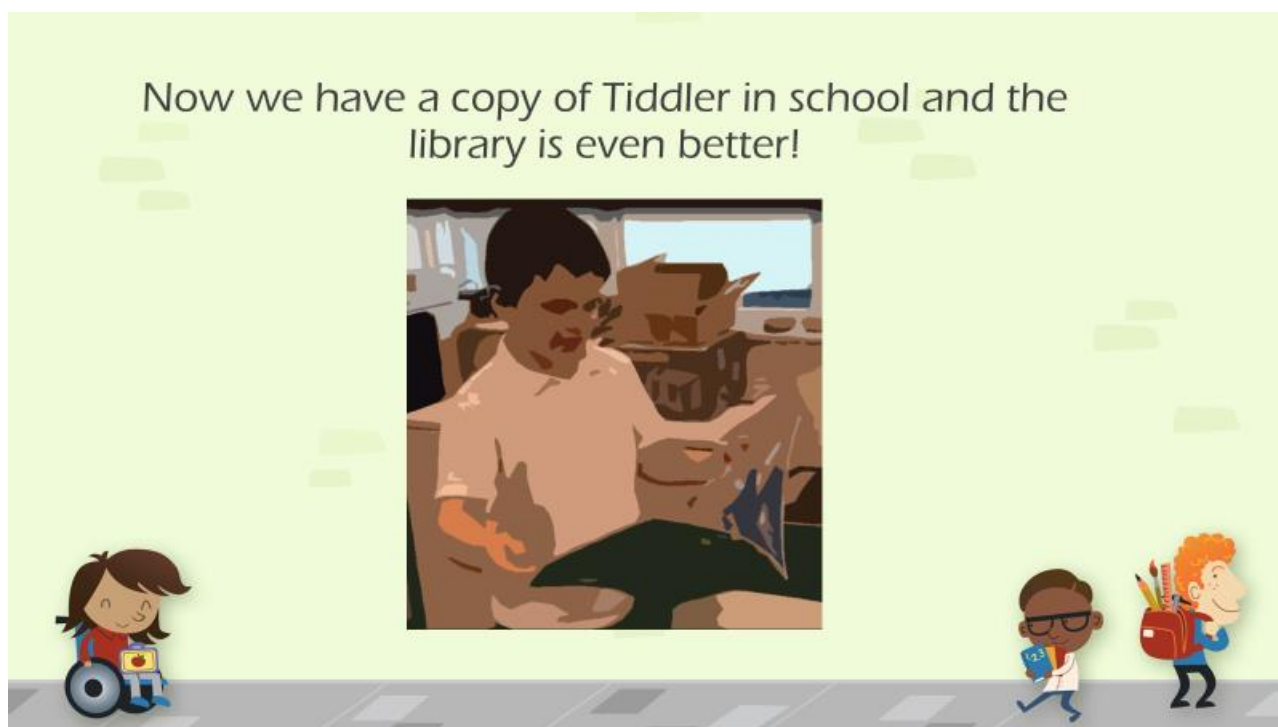
Shaun and I were stood outside the office all this time. He watched calmly from the corridor whilst I filmed the interaction on the iPad. But on Cai's energetic exit, Shaun absorbed some of the excitement and the two of them ran around the corridor laughing and skipping.

"*Can I have Tiddler? Can I have Tiddler?*"; the synthesised voice provided the beat for their merry dance. Moira and Linda were still talking to the headteacher which was a shame, because this was the first time I had seen the boys laugh and play together, and it would have been better shared. Their laughter was infectious, and I found myself chuckling at their antics. Then they burst into a small meeting room and I had to usher them out and apologise to the three adults inside. Thankfully, they seemed more amused than inconvenienced. Moira and Linda joined us, and we walked back downstairs to the classroom. We were all quiet now but smiling to ourselves; it felt like we had achieved something positive that day.



'Tiddler' was delivered to the school the following day and Linda felt it best to take Cai to collect it as soon as possible so that he continued to understand the link between expressing his wishes, the headteacher taking action, and receiving the book for the library. She sent me an enthusiastic email describing his interaction with Beth, the headteacher's secretary, which she also recorded on an iPad for me to view the following week²¹. I read Linda's email through a few times. A sense of pride in Cai came through in her words and it was a moment in the project where I felt validated. There were so many instances of things not going to plan, doubting if the children were enjoying participating, worried that the adults thought the project was pointless and essentially for my benefit. But here was Linda taking extra time out of her schedule to follow up on the project's activities when I wasn't even there. And video footage of Cai talking to Beth, an adult he had never spoken to before, where he initiated reading the new book with her. The look on his face when he opened the package to find Tiddler; his calm, immovable expression broke into the biggest grin. And so did mine.

²¹ Visual interaction analysis of co-construction to follow in section 5.3.6.



I sat in the school foyer waiting for Linda. I planned to go through the children's 'story-so-far' in a group using a PowerPoint presentation, but I had also printed off a hardcopy for the children so they could turn the pages like a storybook. Still no Linda. Ten minutes passed and Moira popped her head around the door and smiled at me. As she led me to the classroom, she explained that Kojo had gone to music as planned with Kate, Shaun was on holiday, Linda was off sick, so it would be just Moira, Cai, and me today. We sat together in the deserted classroom. I gave Cai his book and he studied the pages intently as I read the words to him. Moira looked on. She was very still, calm and quiet today. Her gaze fixed on Cai's expressions as he soaked up the pages. I had never seen her so calm and positive. I wondered if she found the group format stressful. Or perhaps having this one-to-one time with Cai allowed her to listen and watch in the moment, rather than prepare for potential negative behaviours. When we finished reading the story, Cai took his storybook and went to look at it by himself. Moira shared her observations with me.

"He was really concentrating on the page with his collage on" she said. This was the collage of crocodile, zebra, and 'Tiddler' pictures which he so meticulously stuck down with

Sellotape. "He touched your hair when you were reading, that means he likes you." Moira smiled knowingly and checked on Cai. I confess I didn't notice Cai touching my hair at the time, but was pleased to think that he had accepted, and maybe even enjoyed my presence.

Perhaps Cai's delicate action carried favour with Moira too, as she spoke to me about her life and experiences openly that day.

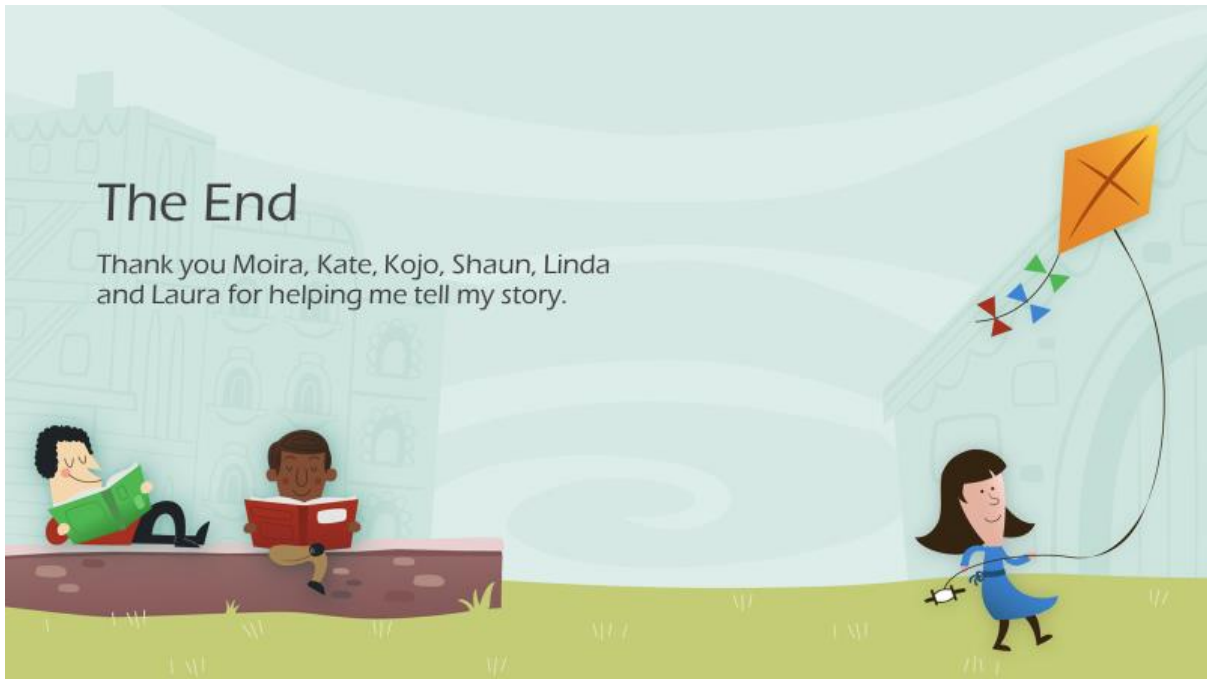
"Could you stay a bit longer today and meet Cai's mum?" she asked. "She would love to see his book."

I was more than happy to wait. In comparison with my role as a speech and language therapist, being a researcher felt quite detached. As a clinician, I speak to parents frequently; they are involved in setting their child's therapy targets, updated throughout by phone-call and then receive a written report on the outcome of the therapy. Typically, I have known the families for years by the time the child goes to school. Research ethics within this study dictated an approach whereby these children were not previously known to me and had been recruited via gatekeepers: the headteacher, and Linda, as the AAC specialist teacher. I had not spoken to Cai's mother in person and was keen to see her reaction to the things he had done so far. Cai's mum popped her head around the classroom door. The similarity between her and Cai was striking, the same angelic face and smile. She approached Moira, her relaxed demeanour telling of their relationship. Moira introduced me as the PhD student Cai had been working with and she nodded and smiled at me in recognition. Cai buried his head in her side as she spoke to me, lightly pressuring her towards the door as if to say, "its home-time let's go!" But she stood and looked through his storybook.

"Oh yes, he likes crocodiles!" she said and told me about a ceramic crocodile he liked at his grandparent's house. She talked about how good it was to see details of what he likes, specific elements of the story, rather than just liking 'reading' as a general activity. Cai stretched up as she spoke, pulled the corner of his storybook down and turned to the back page.

He read aloud, "The End", touching each word with his index-finger, then pushed the book towards his school bag.

Cai's mum, Moira, and I shared a smile; time to go!



As we approached the end of the project Shaun and Cai seemed familiar and comfortable with the session structure and expectations. In the penultimate session Moira was not in. Kate and Linda sat chatting and there was a relaxed atmosphere as Shaun and I set up and Cai wandered, keeping one eye on our progress. As the screen flickered into action, Cai came and sat down, happy to see it was his storybook we were talking through first. Cai had already seen his completed storybook the previous week, but the others hadn't so I decided to go through it again. Shaun's eyes wandered, his body rocked, his fingers played with the side of his chair. He occasionally tapped Kate's leg, but she kept her eyes fixed on Cai's story and Shaun listened through to the end. I expected Cai to get up and wander as we went through Shaun's storybook, but he stayed seated, rocking gently back and forth on his adapted chair. Then midway through, Cai stood up and approached the laptop, pressing his face to the screen as if studying some detail we had all missed. Kate glanced at Cai with a smile and continued to talk about Shaun's love for the Touch Therapy room, a space where the children could go for tactile activities and relaxation. Kate began explaining it for my benefit.

“There's a big bean bag and a sort of really big mat like a...a gym, a gym mat. It's kind of like a bed so they lie on it don't you?” She turned to Shaun, “And then what do you put over the top?”

Shaun looked at Kate with a broad grin “A blanket!”

I smile at Shaun's excitement. “Oh, that's nice and how do you feel when you're under the blanket?”

“I...urgh mmuh”, Shaun looked down at the floor.

Kate leaned towards him, “uh?”

“I normally go to sleep,” he said smiling. Shaun rocked forward in his chair and pulled Cai away from the laptop screen and down on his lap for a cuddle.

“And you have usually got a buddy, haven't you?” said Kate.

Shaun continued to smile and rock gently on his chair with Cai on his lap. Cai's expression didn't change but neither did he attempt to free himself from this impromptu cuddle.

“Do you go there with Cai sometimes?” I asked Shaun, but Kate answered.

“There's usually another child from class, but sometimes Cai.”

Cai stretched forward away from Shaun's embrace and I held out my hand to steady him.

“Cai comes,” said Shaun with a shrug, and he let Cai go.

I catch the gaze of Linda and Kate and can see they are both smiling at this unexpected social interaction between the boys. For the past two weeks, we adults had planned what we thought to be fun or silly activities, where they could take it in turns to choose funny hats for each other, and for us. The boys were less than interested in this and on both occasions had walked away. Now they were hugging. We should have let Shaun lead more often. Going with the flow seemed to get better results than our best laid plans!

It was our last session together. Linda and I entered the classroom and there were children everywhere. Voices in various pitches ricocheted off every surface. The class teacher approached us and spoke directly to me gesticulating occasionally with her index finger.

“Right there’s a few things to be aware of this week. Shaun’s in a difficult mood and Cai’s not listening, but I have parents evening today so can you finish a bit early?”

“Yeah no problem.” Shaun bounced towards me laughing. “Can you help me set up the tripod Shaun?”

“He’s obsessed with technology.” Moira rolled her eyes and walked outside to where Cai was stood on the playground.

Linda and I watched Cai through the window as Shaun set up the tripod. Cai was throwing toy cars against the wall and saying something repeatedly that sounded like “sad, sad, sad.”

Though I had planned to end the sessions by letting the children invite people to see a presentation of their stories, the other adult participants felt the boys would not understand that activity. So, we adapted the plans to support the children in deciding who to share hardcopies of their storybooks with. Linda had made a communication page on the school iPad in the same format as the grids on Cai’s VOCA. It had the photographs and names of different people in their school lives: teaching staff, classmates, therapists that they saw every week, etcetera. Cai scanned the page, looking at each individual face.

He pressed two buttons “*Michael*,” “*David*,” (both children from his class) and walked across the classroom.

“No that must be a mistake” said Moira. “He’s actually afraid of those children.”

“He did seem to make a definite choice?” I replied and glanced at Linda.

“If we give them his story, they will ignore it or flap it.” Moira got up and followed Cai to the other end of the classroom, moving him away from the snack cupboard.

“Maybe you could read it to the class?” Linda raised her voice a little so Moira could still hear.

Moira shook her head, “We won’t have time today, but yeah maybe.”

I turned to Shaun with a smile, “OK, Shaun is there anyone you would like to share your story with?” Shaun was smiling but squirming as if uncomfortable in his seat.

“Yeah um,” Shaun scanned the page quickly, pressing “*Robert*” “*Robert!*”

“Robert is an LSA in the class next door,” Linda explained.

“You could go and ask him to listen to the story now,” said Moira, “they’ve got enough staff in there today.”

We did as Moira suggested. Shaun sat with Robert in the corridor turning each page of his story whilst Robert read the words enthusiastically. I looked up at the clock and Linda checked her watch in agreement. I had to go. I said goodbye to Shaun in the corridor and told him that was the last session, so I wouldn’t be back next week. Shaun gave me hug and ran back in the classroom. I went in to say goodbye to Cai.

“Laura’s going now Cai. No more Action Heroes now, you’ve finished.” Moira held Cai’s hands in hers whilst she explained.

Cai turned his body towards me and looked at my shoulder. “Bye, bye, bye,” he whispered and waved his hand.

5.3. Co-construction of AAC mediated messages: A collection of interactional instances revealing the talk, visible actions and material artefacts involved in the co-construction of messages mediated through AAC.

The following six video fragments of interaction were chosen as they are examples of *how* the child participant, Cai, told us his story, rather than the content of the story. These fragments were highlighted by footnotes in the preceding ethnographic account. The fragments have been analysed using visual interaction analysis procedures based on the work of Heath *et al* (2010) described in section 4.7.2. of the methodology chapter. Figure 5.1. illustrates how the excerpts of video relate to Cai's story and gives a summary of each interaction as well as the duration of footage analysed. Throughout the analysis I refer to myself in the third-person, Laura. I am involved in many of the interactions which has aided me in interpreting certain details. However, I conducted this analysis as a critical observer of the video footage and did not wish to convey my findings in the first-person, giving the incorrect impression that I was aware of the minutiae of my interactions at the time they occurred. The sequential description of the unfolding interaction is described in the present tense as a means of taking the reader through the details of the video recording as it happens.

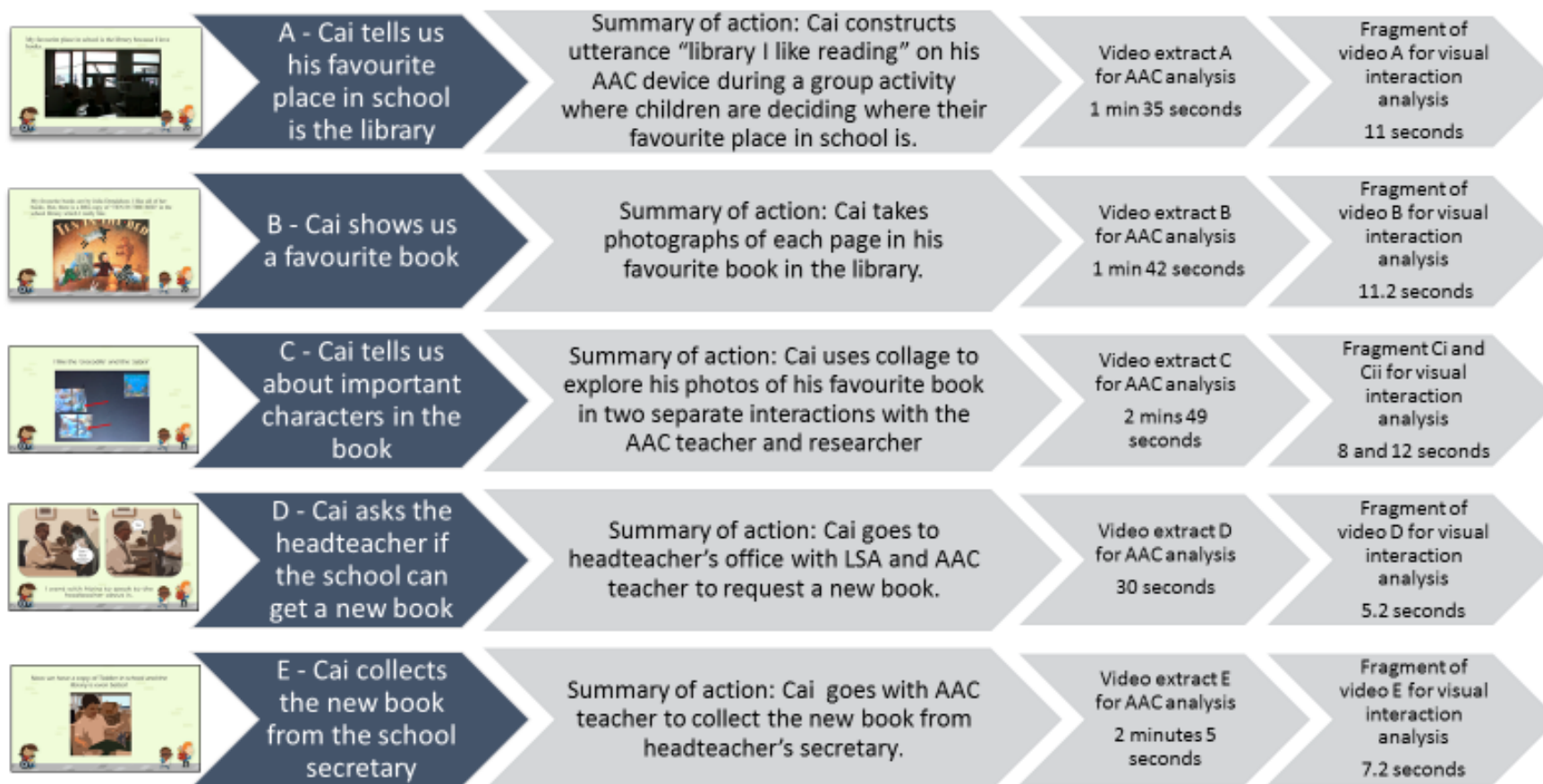


Figure 5.1. Video extracts corresponding to Cai's storybook

5.3.1. Video fragment A

Introducing the context

Fragment A is drawn from a group interaction involving the researcher and all 6 participants. Researcher Laura leads the discussion which is concerned with which places in school are important to the children. However, despite appearing like a group discussion, the interaction between Linda and Cai occurs in a side-sequence whilst a group discussion is ongoing. Therefore, it is a dyadic interaction which eventually contributes to the multi-party interaction.

Figure 5.2 is a video still of Cai using his VOCA and illustrates what Cai and Linda are orientated to in this interaction. Each button will speak the word when pressed, as well as adding the word to the sentence window at the top of the screen. When complete, the whole sentence can then be spoken again by pressing the sentence window once. Buttons with a small black triangle in the top right corner are folders. They do not speak the word but open onto another page of vocabulary.

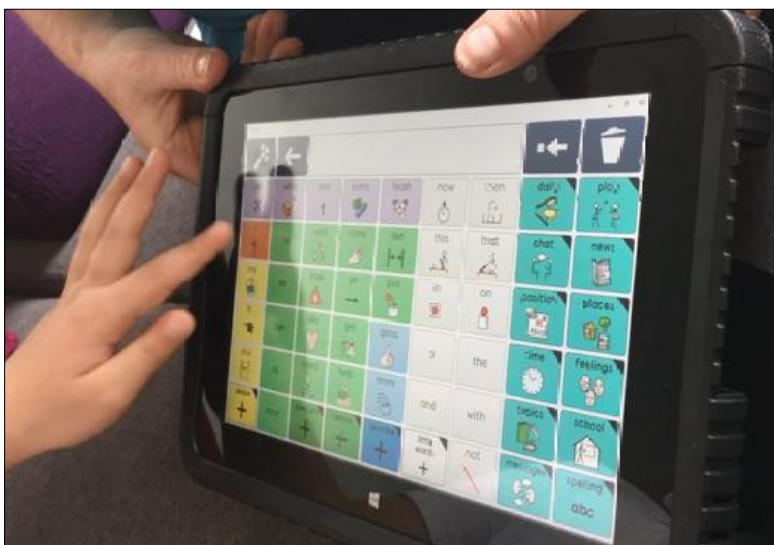


Figure 5.2: VOCA home-screen



Figure 5.3: Visual transcription of video fragment A

Sequential description of unfolding interaction

Linda and Cai's physical proximity and body language indicate that co-constructing messages through Cai's VOCA is a comfortable and familiar process for them (see Figure 5.3.). Cai's arm placed around Linda's neck is indicative of the trust and pre-existing bond he has with her. Linda's hand supports the device leaving Cai and Linda with one hand each to activate the buttons. Their physical positioning reveals their intention to use the VOCA as if they were one person with one pair of hands.

Linda begins constructing the sentence by pressing the symbols "I" "like" which are both available on the home screen. Cai can do this independently, however, despite appearances, the goal of this interaction is not for Cai to tell Linda his opinion; she already knows Cai's favourite place from information he has relayed through low-tech AAC, gestures and facial expressions across previous activities. Now that she has this information Linda can use a dyadic interaction alongside the group discussion as a teaching episode, with the goal of showing Cai where the new vocabulary "library" is stored. Her activation of "I" "like" draws Cai's attention to the screen perhaps indicating to him that she wants to show him something that will develop the sentence further. Cai's gaze is fixed on the VOCA

throughout this fragment as he attends to the 'lesson' in a teacher-pupil exchange that is familiar to him.

Linda paces her spoken language in tandem with activating each symbol at around one button per second. This slower pace ensures Cai can see how she is navigating through folders to get to *"library"*. However, it also has a repetitive effect as if the VOCA, and by extension Cai's voice, is repeating what she is saying: *I "I" like "like"*. Her spoken language is quiet, almost whispered, so as not to disturb the wider group discussion. When she reaches the 'places' page she pauses and indicates to Cai that it is now his turn to activate a button. She initiates this by moving her index finger around as if she is searching for the symbol but cannot find it, cueing Cai to help her search. Her spoken language and intonation implies that she expects Cai to find (and press) the symbol; *°is the library here?* This question, in conjunction with the visible searching action of her index finger above the screen makes a response from Cai relevant.

Unlike the typical mental process of word-finding, word-finding in AAC can be made visible as vocabulary items have a distinct geographical location available to view for both interlocutors. Linda utilises this tangible mode and represents the process of 'searching' with a visible action; moving her index finger in a circular motion above the screen. Notably, Cai does not just observe Linda constructing the whole sentence on the VOCA and she does not press *"library"* herself. Co-construction, rather than demonstration, is used to increase the likelihood of Cai finding the vocabulary independently next time he needs it. Cai identifies the observation element of the teaching episode is complete and he must now complete the aided-utterance. He responds accordingly and when he finds the LIBRARY symbol, he speaks the first syllable of the word as his finger moves towards the button resulting in a spoken word-approximation and synthesised utterance; *°lie:↑ "library"* (see section 4.7.4. for notation conventions). This mirrors Linda's own technique as she simultaneously vocalises and activates each symbol; a strategy which models verbal output in tandem with demonstrating vocabulary location on the device. This example reveals that Linda is simultaneously supporting the development of Cai's speech and use of AAC: the modes are not mutually exclusive.

Now the co-constructed sentence *"I like library"* is available for future use on the sentence window. This sentence, though co-constructed in a dyad, has relevance to the

wider group discussion and Cai will be able to use it with the researcher Laura, when it is his turn to answer the question: where is your favourite place in school? Interestingly, Linda has not modelled activation of the definite article 'the' in the co-construction of this sentence, despite using it in her spoken language *°is the library here?* In this instance, there is no way of knowing if Linda was aware of the elision of "the" in her modelled VOCA utterance. But it suggests an awareness of Cai's stage of language development. For example, it may be that remembering the location of both "the" and "library" would be too much for one episode of modelling and as the information carrying word, "library" takes precedent. Nevertheless, this does create a discord between the spoken language Cai is hearing from Linda and the synthesised utterance he can hear, and consequently express.

Summary of co-construction processes

This fragment of co-construction in a teacher-pupil dyad reveals the intricacies involved in modelling hi-tech AAC in an everyday interaction. Broader processes at work include the existing pupil-teacher relationship, shown here through whole-body proximity, and context - embedding AAC teaching into a side-sequence of interaction which has relevance to an ongoing, multi-party discussion. Though both conversation partners sequentially contribute to this interaction, it is the adult who uses visible actions to draw attention to and maintain joint orientation to the AAC device; uses steady and slow-paced naturally-spoken talk in tandem with symbol activation (aided-talk); and timely use of pause with a searching gesture towards the VOCA to prompt the child's AAC contribution. The observable co-construction processes in this episode of aided language modelling reveal the interdependence of naturally-spoken and aided talk, visible actions, and manipulation of the material artefact; the AAC device.

5.3.2. Video fragment B

Introducing the context

Fragment B is taken from a video of the children exploring the library. Cai has identified the library as his favourite place in school and has gone into a side cupboard to find a specific book, 'Ten In The Bed' (Dale, 1998). It is a large book meant for group-reading sessions, so

he rests it on a beanbag and kneels to look at it. Cai has been shown how to take photographs of the book using the school iPad and he does this independently on the floor. Moira and Kate are supporting the other two child participants, Linda is talking to Laura whilst adding vocabulary to Cai's VOCA. This is one of the few instances across the research project where Cai initiates an interaction. Figure 5.4. is Cai's own photograph of the page that both he and Laura can see during this interaction.



Figure 5.4: Cai's photograph (Dale, 1998, p. 3)

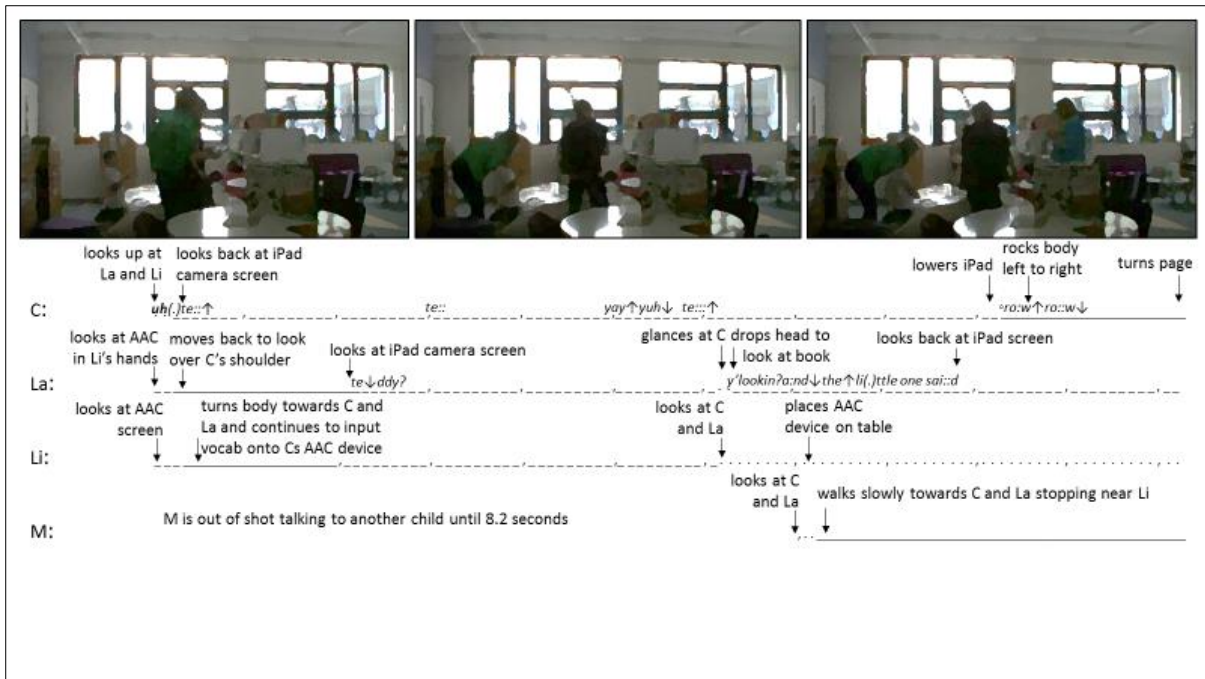


Figure 5.5: Visual transcription of video fragment B

Sequential description of the unfolding interaction

Cai's initial vocalisation is loud enough to suggest he is trying to get a nearby adult's attention (see figure 5.4.). He also glances at Laura and Linda, though they do not see this at the time. A loud vocalisation is needed to ensure the adults who are standing up with their backs turned know he is speaking to them from the floor. Therefore, Laura knows that Cai is not just vocalising to himself, which he frequently did when working independently, but trying to draw her attention to something. Cai's gaze returns to the iPad camera screen, which makes it difficult to clarify what his vocalisation represents. He could be generally drawing attention to an issue with the device itself, the illustration in the book, which is visible through the iPad camera screen, or trying to say a specific word. This communicative uncertainty makes Laura's next move relevant. She positions herself behind Cai viewing both the iPad and the book from his perspective. Joint orientation to the iPad camera screen allows Laura to see what aspects of the page Cai is zoomed in on (see figure 5.4.) which prompts her question *teddy?* - a possible target given the details of the photograph paired with the *te::↑* sound in Cai's vocalisation. However, Cai does not acknowledge this attempt at communication repair, suggesting it is not the correct target. He perseveres by repeating *te::* and waits. Until this stage, this is largely a typical interaction for Cai and an adult. He does not appear frustrated at the incorrect guess at teddy and their interaction

does not draw the attention of anyone else in the room. Linda, who is adding vocabulary to Cai's device does turn slightly towards Cai and Laura but continues attending to the device. She does not offer the device to Cai so he can use specific vocabulary. There could be several reasons for this, including; there has only been a single speech attempt, one attempt at communication repair, and Cai seems untroubled. Two seconds pass and Laura does not respond to Cai's second *te::* so he tries again, embedding it within a longer, emphatic sing-song intonation *yay↑yuh↓ te::↑*. At this point Cai gets Linda's full attention and Laura is prompted to look at the book directly, rather than through the iPad screen. Laura is now orientated to the whole page rather than a snapshot, which shifts her focus to the words on the page; 'there were ten in the bed'. In this case, a shared contextual knowledge of the rhyme 'Ten in the Bed' is necessary for understanding Cai's use of sing-song intonation and the successful co-construction of this interaction. Interestingly, Cai uses this familiar rhyme to interact with the unfamiliar adult Laura. Cai is active in this co-construction, leaving space for Laura to contribute the next line, *and↓the↑li(.)ttle one sai::d*, before taking his turn singing; *oro:w↑ro::w↓*. Given the quiet sing-song intonation, rhythmic rocking of Cai's body, and Laura's preceding turn, *oro:w↑ro::w↓* is clearly an approximation of the line 'roll over, roll over'. Cai's playful interaction with Laura through song is an unusual and interesting event and it holds the attention of Linda, who places the AAC device down in order to watch it unfold. Moira, who is very familiar with Cai, walks across the room to observe the interaction, suggesting that it is a special or, at least, unusual thing for Cai to do.

Summary of co-construction processes

This fragment reveals co-construction processes which are initiated and maintained by the aided communicator Cai (albeit without the use of AAC). Despite interacting with an adult who is not familiar with his non-verbal communication, several co-construction processes are observable that ensure Cai is understood. These include his use of differentiated vocalisations and singing, perseverance, gaze towards the material artefacts (book and iPad), purposeful pausing, and whole-body movements. In this fragment, joint orientation of the interlocutors to the picture book and existing knowledge of a rhyme are both integral to co-construction and ensure Cai's visible actions and talk (vocalisations) can be interpreted and progressed by the adult.

5.3.3. Video fragment C

Fragment C contains two fragments (Ci and Cii).

Video fragment Ci: Introducing the context

Cai is completing a collaging activity. Cai stands at the table, looking through his photographs and deciding which ones to stick on his collage. Over a period of approximately 5 minutes, adults Linda and Laura come and speak to Cai at separate intervals. Fragment Ci focuses on 8 seconds of dyadic interaction with Linda.

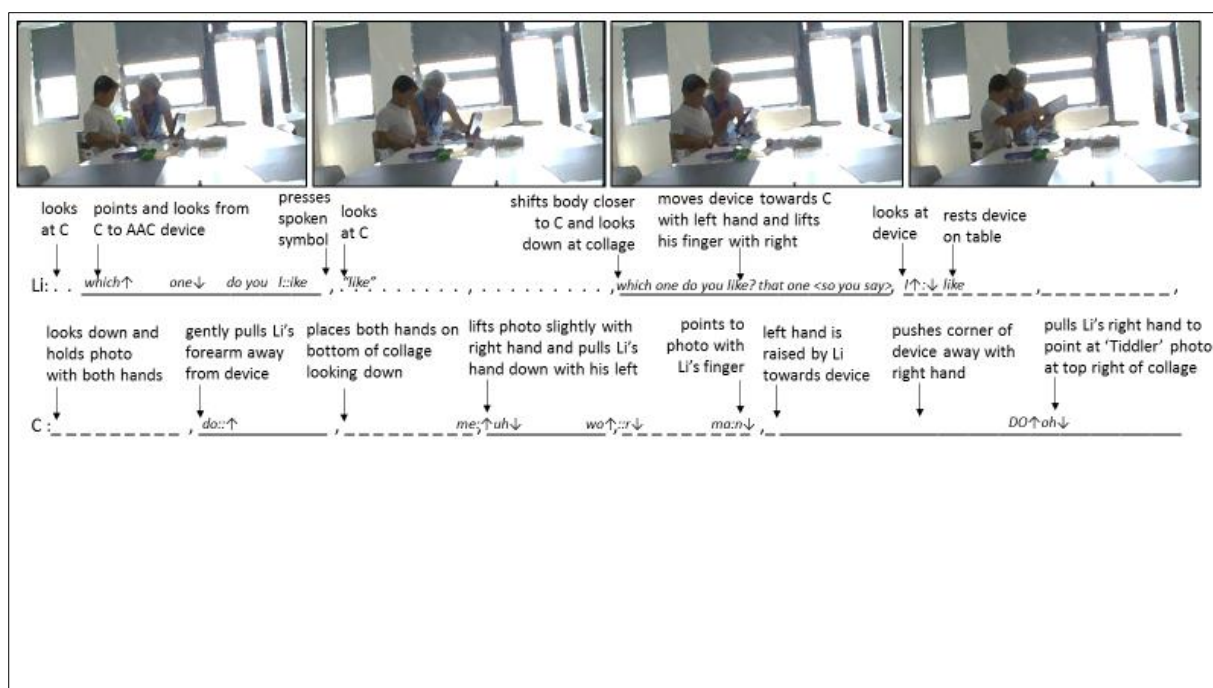


Figure 5.6: Visual transcription Ci

Sequential description of the unfolding interaction

Cai gazes down at the photograph he is holding with both hands (see figure 5.6.). Linda attempts to draw Cai's attention away from the photograph and to his VOCA which she holds in front of him with her left hand. She does this with a sweeping gesture, pointing at Cai and then to the VOCA. However, Cai's gaze remains fixed on his photograph. Linda is attempting to begin an episode of teaching, similar to the interaction described in video fragment A. Again, she reduces the pace of her spoken language; *which*↑ *one*↓ is paced at one word per second (much slower than typical speech) suggesting she wants to model something and requires Cai's attention. However, unlike fragment A, Cai is not

receptive and chooses not to engage in aided-language modelling. Before Linda can finish her sentence he vocalises *do::*↑. He simultaneously pulls Linda's right arm away from the device, suggesting the target word is 'don't' or 'no' as he physically tries to stop her activating a button. Nevertheless, Linda perseveres, trying to lead Cai into the interaction and presses "like" to complete her question; *which*↑ *one*↓ *do you l::ike* "like", and fixes her gaze on Cai suggesting she expects a response. Cai moves his gaze to his collage and within one second responds to the question by simultaneously lifting a photograph whilst bringing Linda's arm down towards it, vocalising two syllables *me:*↑ *uh*↓. Given the sequence of this utterance as a response to a question, in tandem with Cai's manipulation of her arm, Linda is aware that Cai is answering her question and showing her which one he likes. However, she begins again in trying to prompt Cai to tell her through the hi-tech AAC mode, rather than visible actions. She states the question again *which one do you like?* during Cai's movement of her finger towards the photograph meaning that by the time her finger touches the photograph she can say *that one* and quickly tries to model how Cai could have told her using his VOCA; <*so you say*> *I*↑:↓ *like*. Linda's persistence is met with frustration and Cai pushes the device away sharply with his right hand. Again, he shows Linda which photograph he likes by pulling her finger down to touch a photograph he has already stuck to his collage, increasing the volume of his vocalisation *DO*↑ *oh*↓. In the context of a collaging activity, pointing to a specific photograph is a quicker and clearer response than constructing a sentence on the VOCA, for example, "I like this one/that one" where a gesture towards a specific photograph would likely still be necessary. Indeed, solely pointing towards the material artefact (photograph) would likely be an acceptable response for a child of the same age without a communication impairment. Therefore, pointing is both efficient and appropriate which may have contributed to Cai's rejection of the AAC mode in this instance.

Summary of co-construction processes

This fragment is the only instance across the data set where Cai rejects the use of his VOCA. However, close analysis of the video reveals that Cai is rejecting the AAC mode itself, rather than the interaction as a whole, and he continues to respond to Linda through visible actions and manipulation of material artefacts. Cai's rejection of his device in favour of more

efficient non-verbal modes appears clear in the video and is observable through the increased volume of his vocalisations, physically pushing the device away, fixing his gaze on the photographs (never looking at his VOCA), and repeatedly manipulating Linda's hand to point at photographs rather than activate symbols on the device. Linda's persistence in prompting the use of hi-tech AAC reveals that the goal for her in this interaction is not actually to find out which photograph Cai likes, but for him to respond to a question (perhaps any question) using AAC. Unlike the fragment shown in video A, Cai does not see the relevance of aided language modelling to this interaction. This is understandable given there is no new target vocabulary for him to learn and it is not embedded in a group context where an audible utterance is required.

5.3.4. Video fragment Cii

Introducing the context

Cai has been left alone to work on his collage as Linda has gone to speak to another child. Cai's AAC device is on the table to the left of his collage. After approximately two minutes, Laura approaches Cai to see how he is progressing with his collage. She asks Cai if there are any photographs that he would like to stick to the collaging paper. Figure 5.7 shows the photographs that Cai is considering throughout this fragment of interaction.

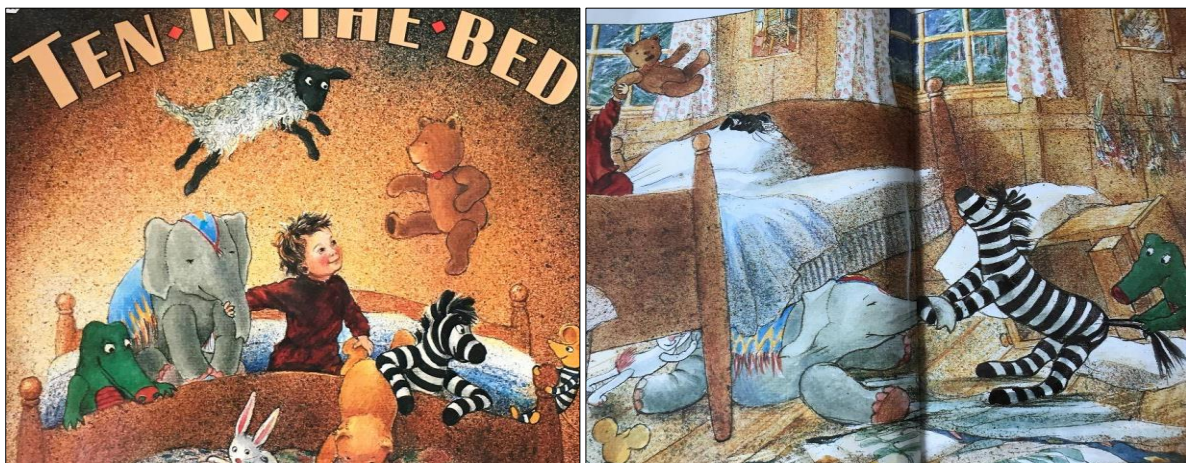


Figure 5.7: Cai's photographs

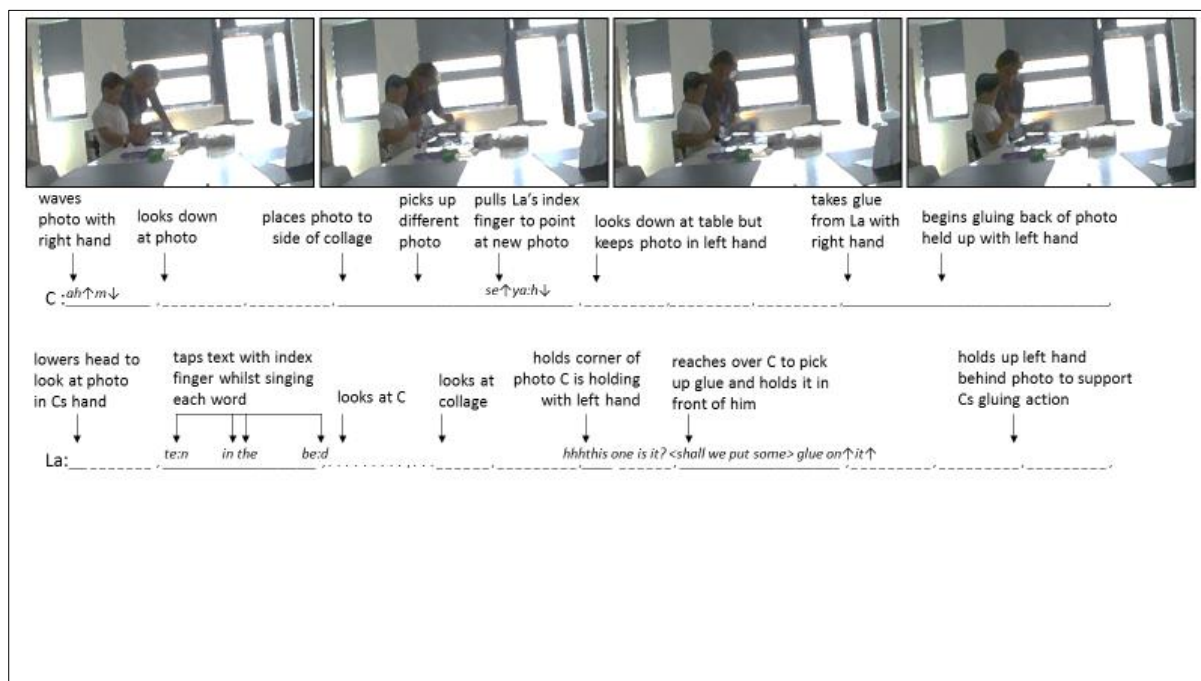


Figure 5.8: Visual transcription Cii

Sequential description of the unfolding interaction

Cai's vocalisations in tandem with waving a specific photograph can be interpreted as his agreement to Laura's preceding question, *shall we stick them on?* The action seems to mark the beginning of their shared endeavour in sticking Cai's preferred photographs to the collaging paper (see figure 5.8.). The wave brings Laura's attention to the photograph then both Cai and Laura look down at the image which is a snapshot of the front cover of the book 'Ten in the Bed' (Dale, 1998) (see figure 5.7.). Laura subsequently points to each word whilst singing the tune: *te:n in the be:d* and looks up at Cai to see if he responds. As well as being relevant to the photograph they are looking at in this moment, the singing of the song is something that Laura and Cai have shared in a previous session (see analysis of video fragment B). Singing in this way leaves two relevant responses open to Cai, he may either sing the next line of the song or choose to continue with the task at hand which is deciding which photograph to stick on his collage. He chooses the latter and sets aside the photograph in favour of another. However, Cai remains active in the continued co-construction of this interaction and signals this to Laura by taking her finger and pointing to the new photograph whilst vocalising *se↑ya:h↓*. Later, it becomes clear that Cai's vocalisation is a word-approximation of 'zebra' though Laura does not pick up on this at the

time, despite the image being primarily of a zebra (see figure 5.7.). At this moment, it does not matter that Cai's word-approximation is not clear, as Laura perceives Cai's movement of her finger as the relevant action in the context of deciding which photograph to stick to the collage. Subsequently, Laura interprets Cai's action as a definitive choice, *hhhtthis one is it?* <shall we put some> glue on↑it↑. Laura continues to use the pronoun *we*, emphasising that this is a shared task but her action of picking up the glue and handing it to Cai signals that he must complete this part himself. Cai understands this and immediately begins gluing the back of the picture he is holding, prompting Laura to hold out her hand in support, to make the task easier.

Summary of co-construction processes

This fragment reveals co-construction processes within an activity which the adult has designed to be child-led. The task itself has been set-up by the researcher Laura, rather than initiated by the child so cannot be described as completely child-led, that is, Laura wants Cai to complete the collaging task but wants him to make his own choices regarding the photographs. The intention to follow Cai's lead impacts Laura's talk and her choice of language. For example, she uses questions, rather than commands, *shall we put some glue on it?* and uses the pronoun *we* to emphasise they are doing it together rather than her telling him to do it independently, i.e., she does not use the imperative 'put some glue on it'. Cai's vocalisations and actions reveal he is happy to complete this shared task and conversely, they also reveal he does not wish to engage in singing the rhyme as he has done previously. Laura recognises Cai's choice and continues with the task of choosing a photograph, literally supporting Cai by providing a surface for him to glue against and ensuring that he glues the photograph rather than her. Though the AAC device is available to use, neither Cai nor Laura appear to feel it is necessary to mediate their interaction in this instance. This fragment is interesting as although it is initiated by the adult, it reveals that both interlocutors are active in the process of deciding which elements of their interaction are relevant and should be progressed. Arguably, this more balanced co-construction is achieved because the adult is actively attempting to be more child-led.

5.3.5. Video fragment D

Introducing the context

Before this interaction, Cai has already told the adult participants that the library does not have a Julia Donaldson book that he likes. Adult participants Moira and Linda have used this as an opportunity for Cai to speak to the headteacher and request that 'Tiddler' be added to the library's collection. Whilst in the library, Linda has added the vocabulary "Tiddler" to Cai's VOCA, and they have co-constructed the sentence "Can I have Tiddler?". The whole sentence is now in the device sentence window in preparation for Cai to speak to the headteacher. Cai has never spoken directly with the headteacher before. He goes into the office with Moira and they are followed by Linda.

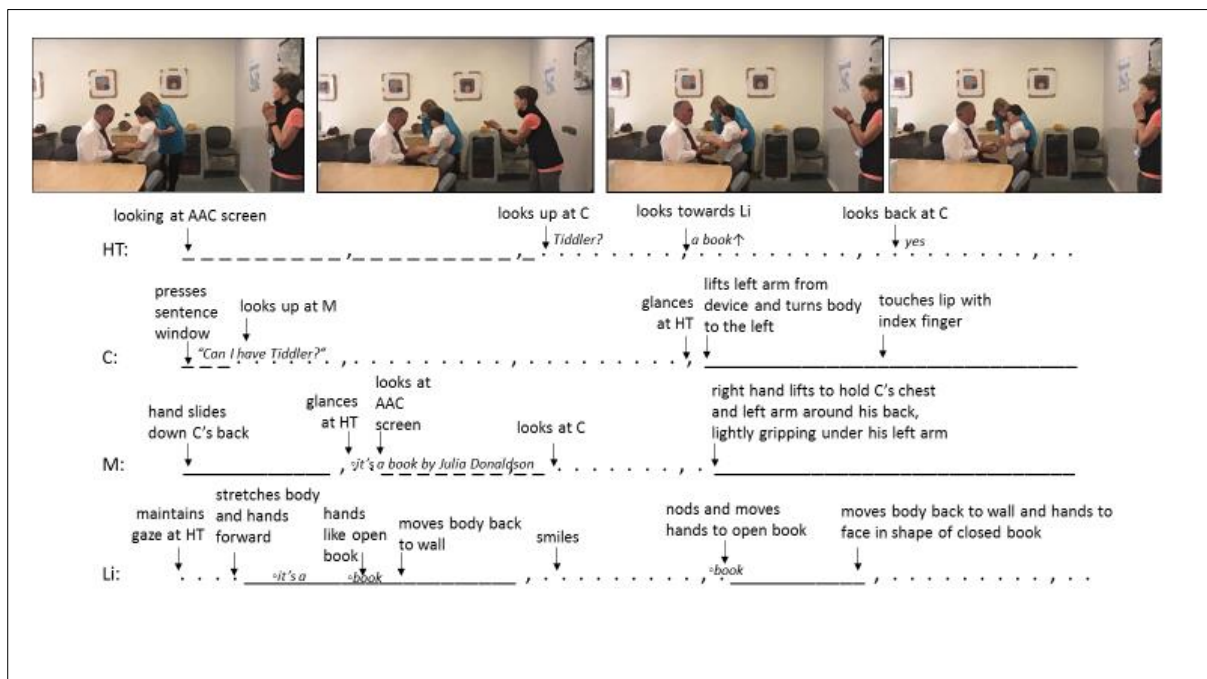


Figure 5.9: Visual transcript video fragment D

Sequential description of unfolding interaction

Cai is holding his VOCA with his left hand, ready to activate the buttons with his right. The headteacher holds out his arms, showing Cai that he will support the weight of the device and Cai has responded by laying it down. These visible actions are important in establishing their joint readiness to begin their interaction mediated through hi-tech AAC and they both gaze down at the device screen in anticipation of Cai's utterance. The primary interaction between Cai and the headteacher is further supported by adult participants Moira and

Linda. Both Moira and Linda are in job roles which support Cai, albeit in different ways, and their proximity to him in this novel situation is perhaps indicative of the type of support they believe Cai requires in this context. Linda stands against the office wall approximately two metres away but keeps her gaze fixed on the headteacher, anticipating that he may need assistance in understanding Cai's request. Moira physically holds on to Cai, sliding her hand down his back and then lightly gripping him as if she anticipates that Cai might try to leave. Both Cai and the headteacher are aware of the presence of these extra interlocutors which is revealed through observing their visible actions.

Cai presses the sentence window, "*Can I have Tiddler?*" and glances up at Moira before the synthesised utterance has finished. It is not necessarily clear if Cai is looking for general reassurance in this novel situation or assistance in clarifying his message. However, "*Tiddler*" is grammatically positioned as a noun phrase in the request "*Can I have Tiddler?*" but does not have any modifiers such as 'a' or 'the'. Indeed, for the utterance to be clearly understood in isolation the noun phrase should be expanded to 'the book Tiddler' or 'Tiddler the book'. The ambiguity caused by absent grammar, paired with Cai's glance towards her makes Moira's next actions relevant as she leans towards the headteacher, glances at his face and quietly gives him some contextual information; *it's a book by Julia Donaldson*. Linda also anticipates that the sentence's ambiguity will require clarification and physically stretches her body towards the headteacher, maintaining her gaze on him and using the Makaton sign BOOK whilst quietly mouthing the word. As shown in the visual transcript (figure 5.9.) these two supports of talk and action from Moira and Linda happen simultaneously. In the context of a special education setting, it is not unusual for adults to use speech-supported sign and here it provides Linda with a means of clarifying Cai's message without auditorily interrupting his interaction with the headteacher. At this point the headteacher has had Cai's sentence clarified by two adults which negates the requirement or opportunity to expand the interaction further and clarify it with Cai directly. Although the headteacher is engaged in co-constructing an interaction through AAC with Cai, he looks up at Linda, using visible actions to acknowledge Linda's input in a way which affords minimal disruption to the primary interaction. The headteacher's spoken utterance is directed at Cai; *Tiddler? a book*↑ and is said in a tone which both asks and answers a

question about what Tiddler is, ensuring Cai knows he has understood the request and acknowledging both Linda and Moira's supporting information.

This contextualises the following responses from Cai, Linda, and Moira. Linda is now confident that the headteacher understands Cai's request and physically moves away from their interaction, leaning against the office wall. Cai knows that his request has been understood and begins to let go of the VOCA, turning his body to the left. Although Cai knows that no further input through the device is required, he has not waited for the headteacher's response to his request. Moira is aware that the socially appropriate action for Cai in this context is to wait for a response and she gently grips him to prevent him turning away and potentially leaving. This gives the headteacher time to look directly at Cai and respond positively to his request; *yes*.

[Summary of co-construction processes](#)

Though only 5 seconds in length, this fragment of video reveals the complexity of an AAC mediated interaction when the young-aided communicator is placed in a novel situation. The headteacher is in a senior leadership position both in respect to the supporting staff Moira and Linda, as well as child Cai. Observation of his visible actions reveals he is positioning Cai as the primary person with whom he is communicating whilst trying to acknowledge the contributions of the adults. He does this by sitting down at Cai's height, using his arms as a supporting surface for Cai to rest his device and thereby make talking/button activation physically easier and switching his gaze from the VOCA screen to Cai's face. This is also apparent in his spoken language which is directed at Cai (rather than replying to Moira and/or Linda). The headteacher also manages the contributions of the adult participants (whether he needs them or not) through a fleeting glance and speaking their contributions aloud; *a book*↑. However, he does not look at Moira or Linda when speaking which is likely to keep the focus of the interaction between himself and Cai. Moira and Linda are attempting to support Cai in this novel interaction with a senior member of staff through use of close-proximity, quietened speech, and sign. However, their actions reduce the need for Cai to clarify the message himself. On the one hand this may reduce the stress Cai may feel in a novel situation when his message requires repair. However, it also serves to control and constrain the interaction so that no more than two turns are required.

5.3.6. Video fragment E

Introducing the context

Linda has brought Cai to collect the book 'Tiddler' from the school office. The school secretary Beth has given him the package to open and Cai looks pleased to have the book. Linda has asked Cai to come back to class but he has rested the book on Beth's desk. Cai does not know Beth well but has initiated an interaction with her in which they can look at the book together. Cai's VOCA is resting on the table above the open book so that both the book and the device screen can be seen by Cai and Beth. Linda then asks Cai to tell Beth what he wants her to do.

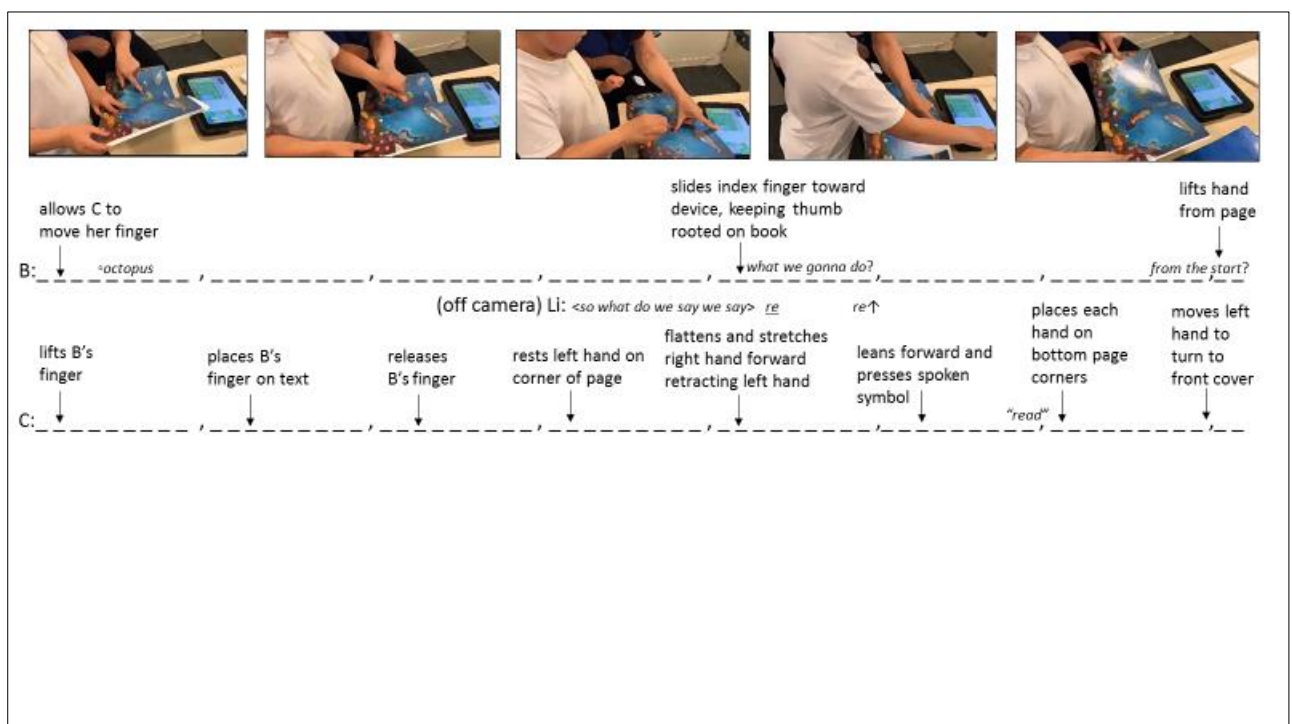


Figure 5.10: Visual transcription of video fragment E

Sequential description of unfolding interaction

Beth is naming and pointing to the pictures on the page using talk and gesture with reference to the illustrations on the page to interact with Cai. However, Cai begins to move Beth's finger away from the picture of an octopus. Beth then completes the business of pointing and naming pictures in a quieter voice °octopus, suggesting she has understood that Cai wants to move on to something else. She allows Cai to move her finger and follows his lead rather than continuing to name pictures. She does this by staying silent, keeping her gaze fixed on the book, and attending to Cai's visible actions. Cai places Beth's finger on the

text (rather than a picture) and then releases it, moving his own hands to hold the book open with a hand on each of the lower corners. This visible action in the context of looking at a book with a partner clearly signals that Cai wishes to read (rather than look at) the book together and as the adult, he expects Beth to read the words aloud. At this point, Linda the AAC teacher, prompts Cai to use his AAC device to make this request. As one might with verbal children who are learning to speak, Linda prompts Cai to say “read” with a phonetic cue, i.e., using the first syllable of the target word: <so what do we say we say> re re↑.

Linda is not directly involved in this interaction and therefore cannot use a physical prompt such as the searching gesture over the device screen as she used in the co-construction fragment in video A, which may explain why she uses a phonetic cue in this context. Beth is aware that Linda is an AAC teacher and wants to prompt Cai to use his device, and so cannot accept his non-verbal actions alone even though they may clearly convey his wishes. As another member of school staff, she must be complicit in the practice of teaching as well as engaging in this spontaneous interaction initiated by the child. Therefore, Beth gestures towards the device and reframes Linda’s target word “read” by asking Cai a direct question which will make this contribution relevant to their dyadic interaction; *what we gonna do?*

However, Cai is also aware that Linda wants him to use his device in this context and close inspection of the video reveals that Cai is beginning to move his hand towards the device even before Linda has used phonetic cues and Beth has gestured towards the device. This suggests that Cai has already understood that an AAC turn is needed in this interaction, but he requires more time to complete the action. It takes Cai 1.1 seconds from beginning to move his hand off the book to pressing the speak-symbol “read” and the device then takes a further 0.5 seconds to begin speaking “read”. A close look at the observable actions in this fragment allows us to see that from Cai’s initial visible intention to say “read” to the completion of the utterance takes 1.9 seconds. Linda is not sensitive to Cai’s hand movements which is demonstrated through her repetition of re re↑ increasing her emphasis and rising intonation even as he is moving. There is only a 0.4 second gap between each phonetic prompt, which may be appropriate in the context of a child who is searching for the verbal word but here is not long enough in the context of a child activating a hi-tech AAC utterance. Nevertheless, Cai has now complied with the adult’s prompts to use his device and he and Beth resume their interaction on Cai’s terms. Cai lifts the pages to begin

turning to the front of the book which Beth interprets as his desire to begin *from the start?* and he guides her finger over the text whilst she reads each word.

Summary of co-construction processes

This fragment is a further example of how Cai can initiate and maintain an interaction with a less familiar adult, this time with the use of hi-tech AAC. It is an interesting fragment as it reveals both Cai and Beth's acceptance of including the AAC mode in their interaction, but their acceptance is in part due to the presence of the AAC teacher, Linda. Her presence means both Cai and Beth work to make an AAC contribution relevant despite the considerable clarity of Cai's visible actions towards the material artefact, the book. Pictures and text are available for both interlocutors to view which makes the use of gestures, especially pointing, clear and relevant in this context. Both interlocutors have their gaze fixed on the book making it clear that this is the primary object of interest and relevance to their interaction. Co-construction is achieved through Cai's physical movement of Beth's finger in reference to salient features of the page. Beth is complicit in this movement, allowing Cai to show, rather than tell, her what he wants her to do. It is Linda, rather than Cai or Beth who makes an additional artefact, the AAC device, relevant to the interaction. Her role as AAC teacher pervades the business of 'reading together' and creates a new goal which could be described as 'using AAC to request an action'. Both Cai and Beth understand this new goal and respond accordingly, Beth through asking a question which makes an AAC contribution relevant, and Cai through pressing "read" before returning his focus to the book.

The findings of the visual interaction analysis will be discussed in relation to existing AAC interaction literature in the following chapter (6.4).

5.4. A framework detailing what contributions from adult participants were identified as important in the process of storybook co-creation with children who use AAC.

Adult participants took part in a 30-minute reflective discussion after sessions 1 – 5. As shown in table 5.1., adult participants did not attend every session, but all attended the reflective session if they were in the main session. Linda was involved in 4/5 reflective

discussions, Moira 3/5, and Kate 4/5. The discussions were recorded in writing on an existing framework (crib-sheet) derived from pilot study data (see appendix M for an example of a completed crib-sheet). The completed 5 crib-sheets were analysed using Framework Analysis (Ritchie and Spencer, 1994; Gale et al., 2013) (see section 4.7.5. for procedure).

This section of the thesis will discuss the three over-arching themes that emerged from the Framework Analysis. The three overarching themes that emerged were: Consideration of External Factors; Adapting Resources and Activities; and Trialling New Strategies. These themes reflect what adult contributions were important to the process of storybook co-creation with the children. Each theme is comprised of 4 – 6 subthemes which are presented below in table 5.2. alongside a brief definition. Each theme will then be described in detail incorporating evidence from the corresponding subthemes (Gale et al., 2013).

Table 5.2: Framework themes and subthemes

THEMES and subthemes	Definitions
CONSIDERATION OF EXTERNAL FACTORS	Consideration of factors that already exist in the school environment which were not specifically related to AACtion Heroes.
Hi-tech AAC system	Understanding how the characteristics of the AAC device such as size and vocabulary could impact on communication.
Pre-existing relationships	Understanding how the children’s pre-existing relationships with peers and adults could impact on their communication and engagement in the research session.
Knowledge of prior events	Understanding how events prior to the research group sessions could influence the children’s engagement, e.g., staffing levels and personnel change, physical versus seated activity.
Conflicting rules	Awareness of the different expectations of the classroom compared to the research group.
ADAPTING RESOURCES AND ACTIVITIES	Adaptations that needed to be made to resources and activities which were directly related to the AACtion Heroes research sessions.

Diverse adaptations	How the children in the group may need the same information presented differently to ensure they understand, including making new resources or drawing on existing school resources.
Modifying session structure	How session activities needed to be structured to facilitate optimal attention and engagement from the children, e.g., follow 10-minute sit-down task with 2 minutes of physical activity.
Room layout	How classroom equipment such as chairs and computer screens could be best positioned to facilitate the children's engagement.
Response to research activities	Observations of how children responded to novel research resources and activities such as action hero capes, photography, collaging and child-led tour of school.
TRIALLING NEW STRATEGIES	Strategies that adults trialled to meet the aims of the research group.
Actioning 'optional'	What adults needed to do to help children understand that taking part in every AACtion Heroes research activity was optional.
Managing adult anxiety	The potential impact of staff anxiety about children's behaviour on the children's communication opportunities.
Balancing control with support	How to ensure the children had enough support whilst ensuring they had agency and access to novel experiences.
Listening to, not talking for	Challenges in allowing quiet space for children to contribute rather than talking for them.
Facilitating peer interactions	What adults needed to do to encourage children to interact together.
Respecting children's communication	Noticing and respecting all modes of communication (including non-verbal behaviours).

5.4.1. Theme 1: Consideration of External Factors

Theme 1 concerns the adult participants' consideration of factors that already existed in the school environment which were not specifically related to AACtion Heroes. The theme is comprised of four subthemes: Hi-tech AAC system, Pre-existing relationships, Knowledge of prior events and Conflicting rules.

Participants acknowledged that pre-existing relationships and prior events impacted on the children's willingness to engage in the AACtion Heroes sessions. Moira and Kate were

very aware of the impact of prior events on the children and how this could influence children's engagement in the research session. For example: negative impacts such as the fire alarm going off and unsettling them; or positive; they were laughing lots in a previous classroom activity so would be in a good mood for the research session. Moira had a background in behaviour management which involved noticing and managing potential triggers for unwanted behaviour. At times, concerns about previous behaviours that children had exhibited throughout the school day led to anxiety around letting the children talk about things which interested them in the session:

Cai may use unwanted behaviour within the activities as he had been doing so a lot over the course of the day. Moira feels this is because he wanted a book that was not in school and talking about may increase his behaviours again as he would not be able to have the book.

(Moira, session 2)

Kate did not have a background in behaviour management and identified as being a "laid-back person" (Kate, session 4) which she believed complemented the research approach, in that she was happy to observe and see what happened. Linda found letting children get up and move around difficult, however, as a specialist AAC teacher she found avoiding topics of conversation problematic:

Anxiety about the potential for children to display negative behaviours can mean we avoid topics of discussion. Perhaps even avoiding putting vocab on a communication aid, e.g., book titles.

(Linda, session 3)

The removal of behavioural triggers was something that frequently occurred in the classroom and, at times, the rules and expectations of the research group were in direct conflict with these rules. These differences were the source of much debate among the participants, particularly in reference to the children's use of technology. As a specialist AAC teacher, Linda's role would be difficult to carry out without the use of technology and she frequently suggested ways in which research activities and tasks could be carried out through technological means. Conversely, LSA Moira felt that the children were distracted by technology and commented that "screens can be like crack cocaine for children" (Moira, session 2). The metaphor captures the tension between adult support and adult control that is implicit throughout the data set. Comparing screens to a hard drug implies that complete

abstinence is required and that children need strict rules and protections in place to ensure they do not become problematically addicted to technology. This view may have been shared by the class teacher.

They stopped all iPad use in class because it was becoming too distracting for pupils, e.g., rushing their work to get an iPad instead of focussing on the task, or technology failing and becoming a source of frustration for them.

(Moir, session 3)

Although this may be an isolated classroom incident, Moira's use of the "crack cocaine" metaphor reflects the concerns of some people in wider society. Whilst technology is seen as a means of enhancing children's learning (Fox-Turnbull, 2019), control over children's access to screen time is frequently covered in national and international media, often alongside concerns that technology is addictive (Pells, 2017). Participants acknowledged that a balance needed to be found as using technology, for example, using an iPad to take photographs, was an integral part of the research approach for all the children, as well as the obvious need for Cai to have access to his hi-tech AAC device. Participants discussed the problematic nature of simultaneously criticising technology for its addictive properties but using it as a reward for completing a task rather than a tool with which the task is completed. When positioned in this way for children it can become like a drug or reward, "like sweets when you've eaten all your dinner rather than the knife and fork you need to eat your dinner with" (Researcher, session 2). Therefore, the use of technology throughout AACtion Heroes was always integral to completing the task rather than a reward for completing something else. Whilst participants supported using technology in this way, it meant that the children had continued access to technology in the research sessions even when they were not allowed access in the classroom. Therefore, tensions between what was permitted in the group compared to the classroom remained. These issues will be explored further in the theme 'Trialling New Strategies'.

The theme 'Consideration of External Factors' illustrates that AACtion Heroes group did not operate as an isolated practice. Indeed, the process of storybook co-creation is impacted by the setting in which it takes place. It is important to understand what aspects of the group's ethos may complement or conflict with the existing attitudes of the participants, the ethos of the classroom, school, and even society as a whole. Where these

conflict, it can present challenges. Knowledge of the children's personalities, their modes of expressive communication, and how they are affected by prior events and existing relationships is also an integral contribution to the process. Such insights can only be reached through the inclusion of classroom staff who must be given the time to reflect on and discuss these kinds of issues, though perhaps inclusion of the classroom teacher would also be beneficial.

5.4.2. Theme 2: Adapting Resources and Activities

Theme 2 concerns adaptations that the adult participants needed to make to resources and activities which were directly related to the AAction Heroes research sessions. The theme is comprised of four subthemes: Diverse adaptations, Modifying session structure, Room layout, and Response to research activities.

Children from a specialist education classroom are often a diverse group with a range of skills and needs. Despite meticulous planning, the resources provided by the researcher were not always appropriate for everyone's needs. For example, choices were presented using symbol cards to aid the children's understanding but both LSAs raised concerns about this:

Shaun and Kojo need minimal choices, two verbal options at most, due to poor attention/memory. Shaun needs real objects on a clear background because of his visual impairment. Symbols help Kojo to understand but he might still choose the last thing you said because of echolalia.

(Kate, session 1)

All adult participants had experience and skills in differentiating the school curriculum for a diverse range of pupils. This paired with the specific knowledge that the LSAs had of the child participants ensured appropriate adaptations could be made quickly and were put into place in the following sessions. In session two, children used resources they already had in class (PECS book) or new resources were made (photographs of real objects) and staff felt the children were able to participate more fully: "Kojo seemed to make a genuine choice of what he wanted to do today" (Kate, session 2). Nevertheless, the diversity of the children clearly had an impact on the time commitment needed from school-staff participants outside of the research sessions. This was never raised as a problem in this study, but it is

likely that additional contributions from the adult participants would always be required in this kind of approach due to the diversity of the children.

AAC teacher Linda participated in both the pilot and the main study and noted that there was a difference in the child participants' response to the research resources. Most notably was their response to wearing action hero capes and ID badges. Both adult and child participants wore capes and badges which was intended to foster a sense of group identity and equality between children and adults. The children in the pilot study seemed to enjoy this: role playing flying superheroes and proudly showing other adults around school their ID badges. However, the child participants in the main study did not want to wear the badges or capes and though they were provided as an option in every session they showed little interest in them. It may be that the children in the main study did not have a concept of superheroes or understand what the superhero costumes represented, despite this being part of the child participant inclusion checklist (see Appendix I). However, the LSAs proposed different explanations, for example, Kate felt that the children did not necessarily value group identity: "Cai and Kojo mostly do what they want to, not because other people are doing it" (Kate session 1).

The participants acknowledged that the children in the main study responded positively to other aspects of the research approach. Adults facilitating the children's choices and striving to be child-led was a particularly important contribution to the process:

Cai was able to choose to go to the library which he loves so he wanted to take part. He responded well to showing Laura around the school and he led her to the library independently.
(Maira, session 1)

Being able to choose was perceived as a contributory factor in the children's enjoyment of the activities. If an activity is optional it must on some level be motivating for the child or they are not likely to choose to do it. This suggests that being 'child-led' is integral to an optional activity, as adults must follow their decision to engage (or not engage). In the child-led tour of the school, Cai was treated as an expert in his own life (Clark, 2017) and showed the novice researcher the way to the library. Staff were pleased to see Cai's increased independence in this activity whilst the researcher was struck by Cai's use of caring, adult behaviour. He indicated that she should hold on to the banister while ascending the stairs

by tapping it and looking at her face. This action perhaps indicated that Cai was happy and able to take on a more adult-role and understood that he was the expert in this situation.

The theme 'Adapting Resources and Activities' highlights that AACtion Heroes is not an off-the-peg child-led approach whereby identical resources can be used for all children who participate. It provides a framework of suggested activities and resources as a starting point, which then need to be adapted to the diverse strengths and needs of the participating children by adults who know them well.

5.4.3. Theme 3: Trialling New Strategies

'Consideration of External Factors' and 'Adaptations to Resources and Activities' are largely familiar issues for professionals who work with school-aged children in specialist education. However, theme 3 'Trialling New Strategies' forefronts what adult contributions were integral to the AACtion Heroes approach. The theme is comprised of six subthemes: Actioning 'optional'; Managing adult anxiety; Balancing control with support; Listening to, not talking for; Facilitating peer interactions, and Respecting children's communication.

Participants acknowledged that the main departure from typical school approaches was the children's right to choose to take part (or not): "nothing is optional, its school" (Kate, session 1). Staff were concerned that the children would not understand this as they had no experience of being able to opt-out and the word 'optional' would have limited meaning for them. Participants thought carefully about how to demonstrate optional to the children, for example, by allowing them to get up and move away from an activity or discussion when they wanted to. Nevertheless, this was challenging for staff: "Linda guided Cai to sit down in the chair rather than walk around the room. This seems to be a mixed message for him." (Moir, session 2). Linda reflected that she did find allowing the children to move around the room difficult because "if I don't bring him [Cai] back he'll miss out" (Linda, session 2). The group discussed how to manage this at length and decided: "next time we will let Cai walk around if he wants to and Laura will still ask him a question at his turn in the circle if he is close by" (Group discussion, session 2). Allowing the children to move around whilst adults continued focussing on the activity, meant that the children did engage in their own time and way. Arguably, the children's physical movement away from

the activity did not mean they were not listening. By week three, Kate felt it was getting easier for staff “to go with the flow” (Kate, session 3) and felt that although “the children do not understand the word ‘optional’ they noticed that no one was bringing them back to their seat” (Kate, session 3). The children’s right to choose had to be demonstrated, not explained, and likewise the children’s understanding of this had to be observed. In the later stages of the project, Shaun frequently laughed and joked with adults, leading participants to reflect on what optional engagement looked like. “Although he [Shaun] wasn’t sitting, it felt like he was engaged” (Kate, session 5) which suggests there are other aspects of children’s communication and behaviour that show they are listening beyond sitting down and looking at the adult/teacher. Nevertheless, the tension between well-established strategies that school-staff use to ensure children complete curricular activities, and the research approach of being optional and child-led, permeates the data.

Adult participants discussed their anxiety about the consequences of allowing children to talk about whatever they want, especially if it was not related to the task, or if a topic could trigger unwanted behaviour. The group discussed the implications of avoiding topics and withholding vocabulary from Cai’s device as well as the need to manage behaviour and decided:

We will continue to add vocab to Cai's device and encourage him to ask for things using his voice [communication aid]. But, it's ok to say no to requests and give an alternative when he can't have them. Just like we would a child who can speak but can't have what they want at that moment. Cai seemed to cope well with this today, i.e., no you can't get X from the library now, you can choose from these others.
(Group discussion, session 3)

This meant that Cai was being given a choice of available options rather than just hearing ‘no’ which the group felt may limit his frustration. The pressures on staff to carry out their daily duties and avoid challenging behaviours which impact on all children in class may be the root of these anxieties. However, it raises significant ethical questions for supporting children who rely on AAC if adults withhold vocabulary from them: one cannot take away a naturally speaking child’s words if you do not like what they are saying. Participants acknowledged these issues are complex and time is required for reflection and problem-

solving to establish a jointly-agreed approach to management, which had relevance beyond the confines of this project across the school-day.

The challenges of balancing control with support were frequently discussed by the participants and is perhaps relevant for staff working with any cohort of children. The research approach attempted to facilitate novel experiences for the children. For example, speaking to a senior member of staff to request that some change be made to the school is not something school-aged children with CCN are routinely allowed to do. Participants reflected that Cai “managed well with this new experience of talking to a figure of authority [headteacher] that he does not know well” (Group discussion, session 2). Nevertheless, on reviewing the video of Cai in the headteacher’s office, Moira wondered whether if Cai could have managed the situation without her. Adults in supporting roles care about the children in their charge and sometimes concerns about how they will react to novel experiences manifests as controlling the situation, rather than letting it unfold and supporting the child as required.

Related to this issue, is how supporting adults can respect and encourage children’s agency whilst ensuring they are understood in a group context. Adult participants frequently had side-sequences of interaction in dyads with individual children parallel to the group discussion, both to manage children’s interruptions, and clarify the children’s views before they told the group (see fragment A of co-construction analysis section 5.3.1.). Arguably these co-occurring dyadic interactions were important for the children to contribute to the multi-party discussion. However, it also meant there was lots of adult ‘talk’ which prevented children from listening to the contributions of their peers. Furthermore, using lots of spoken language and repeating questions whilst children were thinking may have hindered their responses. The researcher has a clinical background as a SLT and frequently noticed how much language adults (including myself) were using when interacting with Cai:

Cai seems to need extra time to process spoken language. He will also need lots of extra time to formulate a response using his communication aid. Today we [Laura and Linda] were talking to him whilst he is thinking which is probably overloading him rather than clarifying the question.

(Researcher, session 3)

The group decided to focus on leaving longer silences for all children to respond in the following session. Kate believed that this strategy was working and stopped adults intervening in interactions when they were perhaps not needed: “There was less ‘talking for the children’ this week as we were focusing on giving more quiet/time for them to answer” (Kate, session 4). However, all participants agreed that it was a difficult strategy to remember in the moment and decided to “continue to practise giving more space and processing time for all children to respond next week” (Group discussion, session 4). Participants acknowledged that changing your interaction style is difficult and takes practice, but increasing awareness of one’s own talking can positively impact the children’s independent communication.

Despite being a group-based approach, participants acknowledged that social interaction between the children in this study was rare. In the pilot study, it appeared that the child-led, group nature of the discussions had a positive impact on the children’s peer interactions. In the main study, children appeared less motivated by social interaction together. Nevertheless, the researcher noted a rare moment of spontaneous interaction: “When Cai came out of [headteacher’s name] office he and Shaun ran around laughing [...] The boys looked like they were creating mischief together” (Researcher, session 2). Participants wondered if the excitement of the novel experience was shared between the boys as they skipped around, with Shaun mirroring Cai’s excitement, and attempted to plan activities that would encourage more social interaction.

Next week we will fill the Box with funny hats and masks etc for everyone to wear and ask people’s opinions of each other’s outfits. Perhaps we can encourage the boys to laugh/smile at each other if adults are modelling having fun and laughing at each other.

(Group discussion, session 3).

Nevertheless, the children seemed reluctant to engage: “Cai seemed to find giving his opinion on people wearing hats difficult/unmotivating. He asked to read a book instead” (Researcher, session 4). Facilitating peer interactions proved very difficult for this group of children. The only interactions between children were spontaneous (initiated by Shaun) and not planned by adults. Nevertheless, Kate wondered if the small group context was a catalyst for this:

It's not often these two [Cai and Shaun] would have the chance to interact together as they are usually with lots of other classmates. Cai can find them intimidating and will take himself away a lot.

(Kate, session 3)

It may be that planning and providing opportunities for two children to interact outside of the whole-class environment is enough to facilitate playful peer interactions, when the reduction of adult direction and control allows this to happen. Certainly, Shaun's playfulness increased towards the end of the project as he was allowed the freedom to move around and choose if and when to take-part: "he had a licence to be daft!" (Kate, session 5).

Children with communication impairments frequently have additional needs that require support and they are rarely, if ever, without adult supervision. Kate's use of the metaphor, "licence to be daft" illustrates that children are not necessarily permitted to be child-like in the school context; adults bestow (or revoke) this licence to be playful. Perhaps it is unrealistic to suggest these children are not supervised given the adults' duties and responsibility for assuring their safety. But if this is the case, then adults could plan for times when they supervise at a distance, allowing the children more freedom and space. The goal of the task could be to allow for playfulness, and create opportunities where children are issued their "licence to be daft".

Participants could not fully resolve the tension between the expectations of the research approach in comparison with typical school-activities. This was expressed by Kate:

Giving a choice is ok if that is the desired outcome of the activity, e.g., the point is 'to give children a choice'. However, this would not work if the task itself needs to be completed which is often the case at school. Perhaps there is a place for both.

(Kate, session 3)

This suggests participants perceived it unrealistic to be fully child-led and 'optional' throughout the school day but valued the opportunity to explore this ethos within the parameters of the research approach. Participants agreed that letting go of old ways of doing in order to trial something else was difficult, but it could reap rewards.

5.4.4. Summary

The themes illustrate the complexity of co-creating storybooks with a child who uses hi-tech AAC and his peers with CCN in a special education setting. The co-creation of the child participants' personal narratives about what was important to them about school was supported by the group context but required multi-faceted contributions from the adult participants to be successful. The adults' reflected on, and in many instances adapted, various elements of the approach from week to week. This included: adapting external factors such as the classroom environment or preceding school activity; adapting resources to ensure the research activities were accessible and understandable for all the children; adapting their own (adult) communication and behaviour to support the children. Notably, there were also instances of noticing what could not be changed or observing that a planned change had not resulted in the desired outcome. Nevertheless, it is evident that the process of co-creation relied heavily on the multi-faceted contributions of the adult participants and were influenced by the culture and expectations of the wider special education setting. These findings will be discussed further in relation to previous research in the following chapter.

5.5. Thematic networks illustrating participants' views on the potential and viability of using the AACtion Heroes approach in a special education setting.

On completing the AACtion Heroes approach, I separately interviewed the three adult participants: LSA Moira, LSA Kate, AAC specialist teacher Linda; and one child participant Cai who used hi-tech AAC. Each adult interview lasted between 45 – 60 minutes. The same interview schedule (appendix L) was used for every adult. As outlined in section 4.6.3. Cai's interview was conducted using Talking Mats™ approach (Murphy, 1998). Cai placed 13 photo cards representing elements of the study on a visual rating scale 'like – not sure about – don't like'. Each photo card consisted of a photograph and orthographic gloss; my storybook, taking photographs, my VOCA, being with (child's name) (n=2), being with (adult's name) (n=4), talking to headteacher, box games, cutting and sticking, action hero cape and badge (see figure 5.13., below, for Cai's completed Talking Mat™). Cai's interview lasted 10 minutes.

I analysed the data from the four interviews using the Thematic Network Analysis approach (Attride-Stirling, 2001) (see section 4.7.6. for procedure). Three global themes emerged from the data: the existing school system; the experience of participating in AAction Heroes; and imagining the future considering this new experience. Child participant Cai was not asked about the typical school system: his interview was based on his opinion of the various elements of AAction Heroes and he did not expand on this further. For this reason, Cai's views are presented in the thematic network 'Participating in AAction Heroes'. I will now depict and describe the three thematic networks, exploring the basic and organizing themes that contribute to the three global themes.

5.5.1. Thematic network 1: The Existing School System

This global theme encompassed the participants' views on how things are typically in their own school. It also included their views and perspectives on the wider education system. Figure 5.11 illustrates the four organizing themes and related basic themes which contribute to the current thematic network.

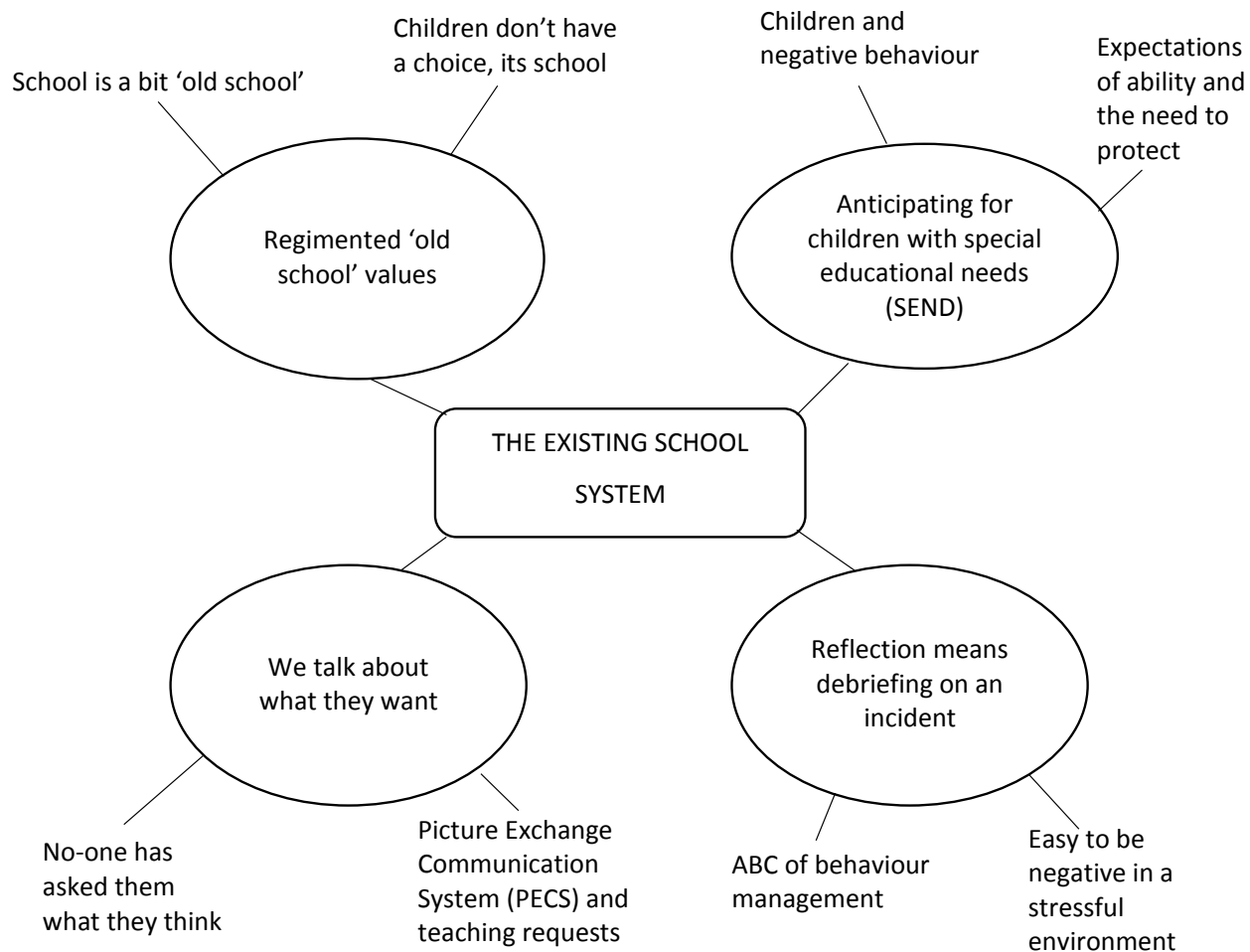


Figure 5.11: Thematic Network 1: The Existing School System

Organizing theme: Regimented 'old school' values

In the interviews, participants talked about typical school life as being highly structured with little room for decision-making by the pupils. Linda noted that “normally in school they [children] don’t have the control, they have to do it”. Kate likened the education system to a relic from a past society, “an old-fashioned, strict school system” which is “a bit old school, how school life is, it is a bit old school”. She contrasted this with society’s current values.

Kate: We’re in a society with everything everyone’s allowed more of a voice but the one place where maybe they’re not is school because you go to school because you’re told to go to school, if you don’t go to school your parents are going to be in massive trouble because it’s a legal requirement that you go to school unless they’re home-schooling you. Then when you’re there you’re just dictated to like eight hours a day, but yet I’m being brought up in a world where I’m allowed a voice and I’m allowed an opinion and I’m allowed a lot of choice, so you’re kind of living in a world of two different parallels.

Laura: Yeah it is a bit mixed messages isn’t it?

Kate: Yeah you know. You’re allowed to vote, you’re allowed to wear whatever you want to wear outside of the school setting, you can be whatever gender you want to be, you can be who you want to be and do whatever job, but in school you can’t, you know.

Kate’s observations about school being a legal requirement suggests she is speaking about the education system in its broadest sense, beyond that of just special education. She asserts that even though society is becoming more accepting of hearing marginalised voices from all walks of life, school remains rigid in its expectations of its pupils. She highlights a discord between what she perceives as society’s rhetoric of acceptance and choice with the realities of being a child who attends a school system with rules and laws that are decided by adults. Kate uses the contemporary cultural acceptance of being “any gender you like” to imply that school is historic in its structure and has not kept up with changes in society.

Organizing theme: Anticipating for children with special educational needs and disabilities (SEND)

Both LSAs discussed the nature of their role in supporting children with SEND which was characterised by being proactive and pre-emptive, both physically and mentally.

Moira: I don't know. I don't. It was difficult in the beginning to sit back. Because for the past fifteen years I haven't sat back for the past fifteen years I've been ((moves hand in forward motion twice)) so that was that was difficult.

Moira felt it was part of her role to anticipate, and where possible, avoid situations which may cause the children distress, or those that would result in them displaying negative behaviours. Similarly, Kate talked about "pre-empting" but raised the need to balance this with letting the children go.

Kate: In terms of working with special needs [children] you're off! Your eyes are in the back of your head all of the time and you're constantly pre-empting which I guess is to some extent is a bonus but to some extent a bad thing [...] It's a bit like when you have a little baby and they're walking and your like ooooo ((waves hands in panic)) but you've got to let them go.

Supporting children in a special education setting goes beyond ensuring they can access the curriculum. There is also more awareness and concern for keeping them, and their peers, safe from harm. In the quote above, Kate compares the experience of supporting (school-aged) children to having a baby who is learning to walk. Although on the surface this may seem infantilizing, it reflects the reality of supporting children in every aspect of their development. LSAs in the special education setting not only support a child's learning, they care-for and facilitate the development of a full range of physical, emotional, and communication skills. It may be that this multi-faceted role leads to the anticipation of children's behaviour and pre-empting (and trying to avoid) potentially negative events which could cause the child/ren distress.

Organizing theme: Reflection means debriefing on an incident

Participating in AAction Heroes required the adult participants to engage in a 30-minute reflection session after each participatory session with the children. Throughout the interviews, the adult participants discussed their previous experience of reflection.

Moira: We don't get much time to reflect. We only get time to debrief on an incident.

Laura: So, would that be more of a negative, a negative incident?

Moira: Yes.

Moira's positioning of reflection as a means "to debrief on an incident" is a powerful use of language with connotations of highly traumatic events in which all people involved may require therapeutic, post-incident discussion. For example, this language is frequently used in discussions of violent incidents in adult psychiatric and mental health services where patients may have required physical restraint, tranquilisation, or seclusion (Burman, 2018, p. 20; NICE, 2017). However, it is also commonly-used terminology in special education in terms of managing challenging behaviours in children with ASD and learning difficulties. Behaviour management strategies that involve identifying the Antecedent, Behaviour and Consequence (ABC) are widely accepted best practice in special education settings (Webster, 2020). Such programmes are based on Skinner's theories of applied behaviour analysis (e.g., Skinner, 1957) and are intended to assist staff in identifying what triggered the behaviour, what the behaviour was (and could mean), and what could be done to prevent (negative) behaviour happening again (Alberto and Troutman, 2012). Linda, similarly, identified that the classroom can be a stressful environment where it is easy to focus on negative events.

Linda: It's quite easy to be negative especially in stressed environments in classes you know, when things have gone wrong and you can be negative and everything else goes wrong and you're even more negative.

ABC behaviour management techniques are intended to assist staff and pupils and decrease negative incidents. However, reflecting on the negative aspects of the school day may well have an impact on staff mental wellbeing (Hastings, 2010) with scant opportunity to identify what is going well and what staff are doing right. Consequently, in the typical special education system, reflection is associated with things that have gone wrong.

Organizing theme: We talk about what they want

Adult participants discussed the types of conversations they would typically have with children who use AAC and noted that they are rarely, if ever, based on the child's opinion. Topics of conversation are either highly structured and the answer to a question is already known to the adult, or intended to ascertain the child's wants and needs. For example,

Linda noted that answers to questions based on the curriculum topic can be made available on the device screen before the question is even asked.

Linda: Or [teachers] just ask questions to do with the curriculum. Because that's easy.

Laura: It's much more structured?

Linda: And it's easy for the pupils because they've got the responses there, they give the response, there's nothing about their opinion.

Moira also noted the change in topic of conversation with the children whilst taking part in AAction Heroes.

Moira: We do ask them what they want [...] I like the idea of finding out what they think. What do *you* think of this? Getting their opinions, because we don't ask their opinion.

Kate discussed her lack of training in hi-tech AAC systems: "No, no training [...] Most of us [LSAs] have the PECS training". AAC training was not widely available in this setting and even the specialist AAC teacher Linda felt her knowledge base had "all been learnt on the job". The only widely available training for education professionals was in low-tech PECS (Picture Exchange Communication System) which is designed to teach children with Autism Spectrum Disorders (ASD) the transactional nature of communication and make requests by exchanging a symbol with another person (Bondy and Frost, 2001).

The global theme 'The Existing School System' illustrates the adult participants' experiences and perspectives of the established school system. It reveals their understanding of broad and focussed issues including; the wider education system, special education in general and typically applied strategies and practice, as well as the specific characteristics of their interactions with children who use AAC.

5.5.2. Thematic network 2: Participating In AAction Heroes

This global theme encompasses the participants' views of what was easy or difficult about participating in AAction Heroes and what elements they found useful and/or enjoyable. This theme includes the views of child hi-tech AAC user, Cai, on various elements of the

approach. Adult participants talked about how AAction Heroes differed from typical school approaches and reflected on whether or not this had any benefits for them. Figure 5.12 illustrates the five organizing themes and related basic themes which contribute to this network.

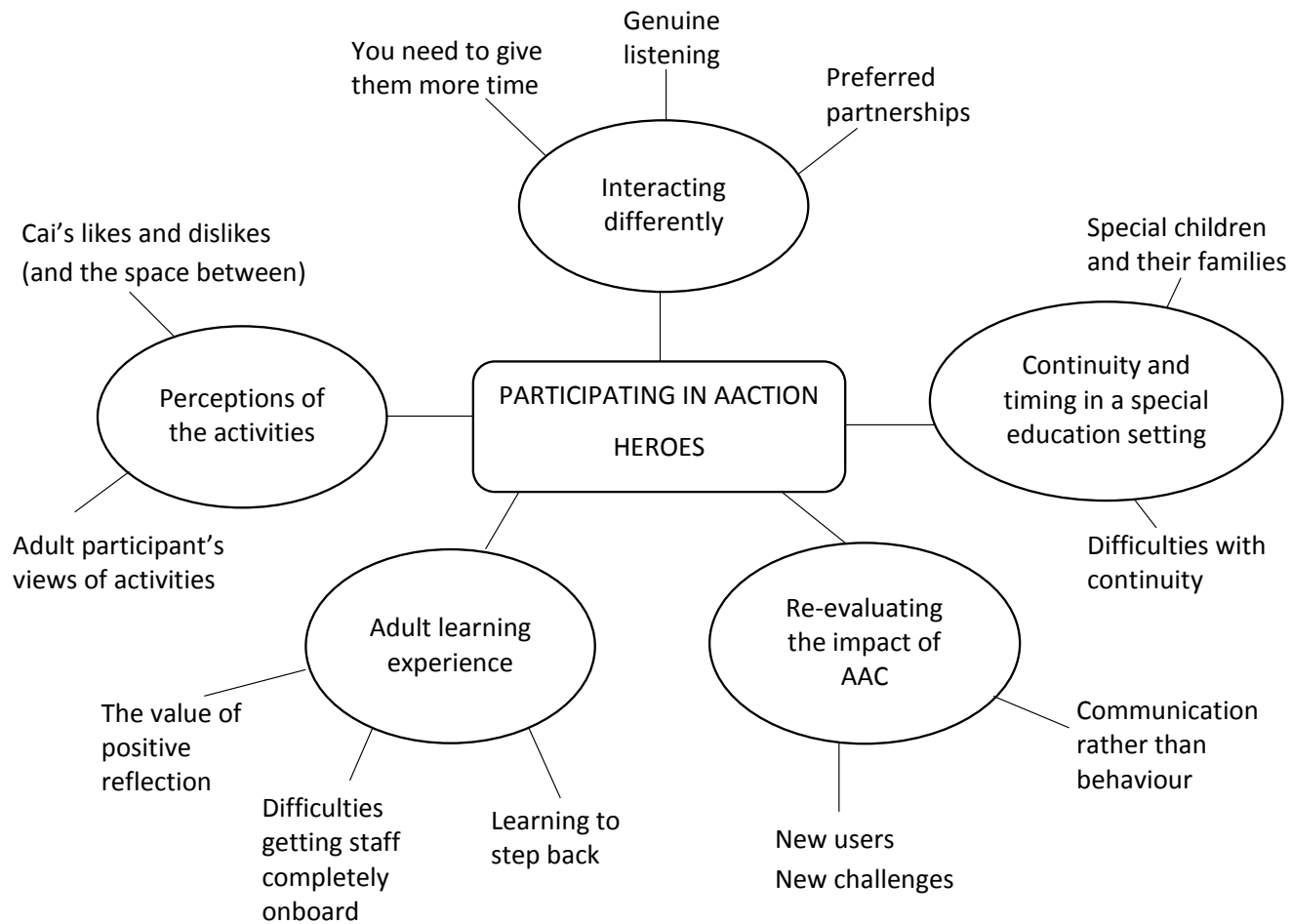


Figure 5.12: Thematic network 2 Global theme – Participating in AACtion Heroes

Organizing theme: Interacting differently

This organizing theme encompasses what the participants noticed about their interactions in the AACtion Heroes sessions. A consistent theme across the data set was that interacting with children who use AAC systems requires more time than typical interactions. Kate felt it was important for the adult to be calm and patient within the interaction; “you’ve got to give them time. It’s giving them the time and not being like ((drums fingers on table impatiently))”. Linda, similarly discussed the need to give children more time, and related the need for extra time to wider, multi-modal, teaching strategies:

Linda: From a teaching point of view, it’s giving them the time, the time and space to show what they want to say in whichever way possible

However, Linda, like Kate, also identified the need to adapt her own behaviour within an AAC mediated interaction:

Linda: Yeah, the time that I need to give to pupils and to, to stop talking. Just stop talking ((smiles)) is the essence of it and not ask so many questions in different ways. Ask it once clearly and shush.

Here the need to give children more time is related to the adult talking less and staying silent whilst the child formulates a response to a question, that is, speaking less and listening more. This was a particularly striking issue for Linda who felt AACtion Heroes changed the way she listened to the children, especially Cai.

Linda: But genuinely listen to them without an agenda. So, listen to what they want to say and [...] just waiting, waiting for him [Cai] to initiate something rather than going in with a ‘I need to teach this’, and ‘I need to teach him that’. It’s saying ‘ok, we just need him to talk and we all want to talk about what we want to talk about’.

As well as highlighting how adults interact differently as a result of participating in the AACtion Heroes approach, participants also pointed to the approach’s impact on adult/child dyads. Kate commented that participating in AACtion Heroes allowed children and adults to work and interact in different partnerships than they did usually, that is, different adult/child dyads than in the classroom where 1:1 relationships were well established. For example, Moira would typically work with Cai and Kate with Kojo, but in the AACtion Heroes approach they had the opportunity to interact as a small group and in different dyads.

Kate: In the partnerships as well, what brings a person out of them and their choosing. Will they choose differently with that person because they bring out more vocab in them than if they worked with another person?

Laura: So, did you mean the adult that they worked with?

Kate: Yeah

The observation that one adult may “bring out more vocab” in the child than another suggests that Kate is aware of the impact that adults can have on the expressive communication of children who use AAC. Based on her responses, Kate appeared to enjoy working more closely with all of the children in the group.

[Organizing theme: Continuity and timing in a special education setting](#)

Maintaining continuity of the AACtion Heroes sessions was an area of difficulty raised by all the adult participants.

Moira: What was difficult? Keeping continuity. Because we had so many breaks because we had sports day and then I was ill, was I off?

Laura: Yeah and the kids were on holiday

Moira: Yeah Shaun was away, so continuity was difficult I think. But then that’s what happens when you’re dealing with people.

Elements such as school events in the summer term, staff and pupil illness, as well as children taking holidays in term-time made it difficult to run the sessions over consecutive weekly sessions. It also meant that some of the children and adults missed sessions (see table 5.1.). Moira felt that this was largely unavoidable due to the nature of working with people in a natural, rather than experimental, setting. Linda suggested that some, but not all, of these issues could be lessened in a different term:

Linda: One of the other things is I would pick a different time of year. So, there’s not as much going on. End of summer term there’s lots going on lots of trips. People are winding down.

Laura: Holidays.

Linda: Holidays. Especially in a school like this, parents do tend to take their kids out.

Not only is the school calendar busier in the Summer, families are more likely to take holidays in this term. Linda also suggested that the child absence for family holidays is more common in special education settings. In the UK, legal action can be taken against parents for taking their children out of school in term time, which can include a fine. However, this is at the discretion of the headteacher who can grant permission if there are exceptional circumstances (Department for Education, 2020). Linda intimates that parents “in a school like this” are permitted to take their children out, which could be related to a variety of exceptional circumstances that would not apply in a mainstream education setting. It may be that difficulties with continuity can never be fully resolved in a special education setting where the mainstream education culture of continuity and attendance is not so rigidly applied (Hatton, 2018).

Organizing theme: Re-evaluating the impact of hi-tech AAC

This theme encompasses the participants’ views on hi-tech AAC, what impact it has on the communication and behaviour of children who use it, and how the types of children who use AAC in this school are changing. The adult participants reported that Cai used hi-tech AAC much more in the AACtion Heroes group than he typically would in the classroom. Kate suggested part of the reason for this was because the AAC teacher Linda was there to facilitate him.

Kate: But having Linda with us and there just being extra staff, he was constantly using his voice, and the voice equals less stress, less stress equals less behaviours, so it all has a knock-on effect positively.

In this quote Kate directly connects Cai using his “voice” (VOCA) to a reduction in stress, and consequently a reduction in negative behaviours. Notably, Kate uses the term “behaviours”, but negativity is implied. The participants frequently use the term “behaviour” to mean negative behaviour throughout the interview data suggesting in this setting, the terms are interchangeable. The idea that problem behaviour is a form of communication is well-established (Carr and Durrand, 1985; Ousley, 2020). It is perhaps unsurprising that an

alternative mode of communication such as hi-tech AAC would result in Cai not needing to use (negative) behaviour.

Linda: I think throughout the whole thing we didn't see any negative behaviours from any of them which can be typical of the class, it can be typical to see negative behaviours in certain sessions and we didn't, [in] however many sessions it was and we've not seen any negative behaviour from any of them.

It may be that the AACtion Heroes focus on multi-modal communication in a child-led context meant that the children did not need to use negative behaviour to express themselves. However, this may not be due only to AAC use. Kate also connected a change in behaviour to children being able to physically move around more in the AACtion Heroes approach.

Kate: I don't think it's necessarily behaviour all of the time it's down to what they're learning and how they're learning it. I think we're in an age where people can't just sit down at tables anymore and just be dictated to and dictated to. I think probably people want to be up and doing more and maybe this bit more of a relaxed approach can get the better out of people.

The idea that the children in this study benefitted from being "up and doing more" is directly related to the types of children who use AAC in this special education setting. Linda articulated this idea in terms of how her role as a specialist AAC teacher has changed in recent years.

Linda: The nature, the need has changed. Even though I'm still working with the other ones [children with physical disabilities] I'm now also working with more and more pupils who are physically able and are using touch screen access. They are not just non-verbal, they are non-verbal with learning difficulties or autism, so my role is changing to do more of that.

In this part of the interview, Linda describes how she is re-evaluating her approach to implementing hi-tech AAC due to the differing needs of the children who can use it. Historically, her role involved children who perhaps had cognitive and language skills broadly appropriate for their age but were non-verbal due to physical difficulties in speaking (and accessing hi-tech AAC) related to underlying conditions such as cerebral palsy. However, children with ASD and/or moderate to severe learning difficulties have different underlying causes for being non-speaking, and as such require different approaches for

learning to use AAC devices. This may include how AAC could support a reduction in negative behaviours and consideration of the child's need to physically move around.

Organizing theme: Adult learning experience

This theme encompasses how the adult participants viewed the experience of allowing children to lead and whether or not they felt this taught them anything new. Throughout the adult interview data set there was repetition of language which reflected this experience and the need to, for instance: step back, sit back, hold back, let things happen, wait for things to happen, let them go. Kate felt that stepping-back was integral to the ethos of the approach, and was the responsibility of the adult participants:

Kate: They've [the adults] got to be in it, understanding it, and be willing to take that step back.

Linda extended this idea to suggest the facilitator (which in this project was me) needed to explicitly control staff behaviour for this to happen:

Linda: It's that taking a step back, letting things happen waiting for them to happen, waiting for the pupils to do things but just having that control with staff to say: 'Well look, we are going to do something different, it's going to be child-led.'

Both Kate and Linda's interview responses suggest that stepping-back is a new experience for staff in this specialist education setting and therefore requires both explicit instruction and individual effort. Although both Kate and Linda felt they had personally learnt something new from participation in the AACtion Heroes approach, Moira did not necessarily value the experience:

Moira: Yeah, yeah definitely a different way of working but I don't think it told me anything I needed to know about myself. I don't think I've learnt anything more about myself.

Laura: OK and based on the experience of sitting back? Would you try that again or is that something you found uncomfortable and you wouldn't do it in the future?

Moira: I have done it before when I've been doing observations of pupils [...] if I didn't know them, I would go and do an observation on them in the classroom.

Laura: With the expectation that you are watching them and you're not expected to be facilitating them at all?

Moira: No

Laura: So what about, so this was kind of different to that in that you are there facilitating them but being asked to step back quite a bit so it's somewhere between that, not quite an observation but not quite hands-on. So how did you find that?

Moira: Not difficult it was just different.

All adult participants stated feeling positive about the reflective sessions, and described them as useful, and valued having time to think about all aspects of the activities, that is, positive as well as negative elements.

Moira: It was a positive experience yeah. It's nice to see other people's opinion when you've had the same experience, to see someone else's opinion of it or somebody else's point of view because we've all got our own points of view. I might not agree with everybody else's point of view but it's nice to hear other people's opinions of the same activity.

Linda also reported feeling comfortable voicing her opinion in the reflection sessions:

Linda: It was just done in a manner that it didn't make you feel that you were being criticised it was just done as a oh yeah ok maybe I shouldn't have done that. Or if someone else said they had or hadn't done something I'd sit there thinking 'Oh I didn't do that either' and it just made you sit and think and that was probably the biggest thing of it all actually, it made you sit and think. Time to think.

Laura: And I think you know you don't necessarily get that time. I think it was mentioned that LSAs particularly don't get that.

Linda: They don't. You know even at the end of the day the children go home and you get your half hour its normally tidying up, sorting something out, preparing for the next day. You don't get time to sit down often to look at your practice and what you're doing as a group of staff.

The adult participants valued having the time to reflect as a group and emphasised that "it didn't feel like you were being criticised". The fact that reflection encompassed both positive and negative aspects of each AAction Heroes session may have contributed to this

non-judgemental atmosphere which is likely more difficult to establish when reflecting solely on a child's negative behaviour.

Organizing theme: Perceptions of activities

This organizing theme illustrates the participants' views of the research activities and includes the child participant, Cai's views. Cai's Talking Mat™ (Murphy, 1998) from his interview is pictured below in Figure 5.13. The faces of the participants have been obscured to maintain anonymity. Notably, Cai valued different elements of the approach when compared to the adult participants. For example, Kate spoke positively about working in a small group (rather than whole class) where the ratio of adults to children was higher.

Kate: I think just having a smaller group with more adults just really massively helped because they can have that focus, they can have that attention and you can help deliver those needs that they're trying to ask.

This demonstrates that Kate felt she could give more attention and take more time to listen to the children in this small group format. It may be assumed that the child participants would enjoy having this increased attention and time to express themselves. Cai clearly expressed his like for working with Kate (highlighted blue in figure 5.13.). However, he seemed unmotivated by working with the other group members, including his peers. Linda, who was present for Cai's interview, noted Cai's treatment of the photo cards:

Linda: Yeah in the interview he clearly, clearly was motivated by something he really really liked and something he didn't like; everything in between he couldn't care less, and I don't think it was a I don't like it, it was a I'm not bothered by it.

Laura: Yeah, it's either a big reaction that's definite or a choo ((mimes throwing cards down on the mat)).

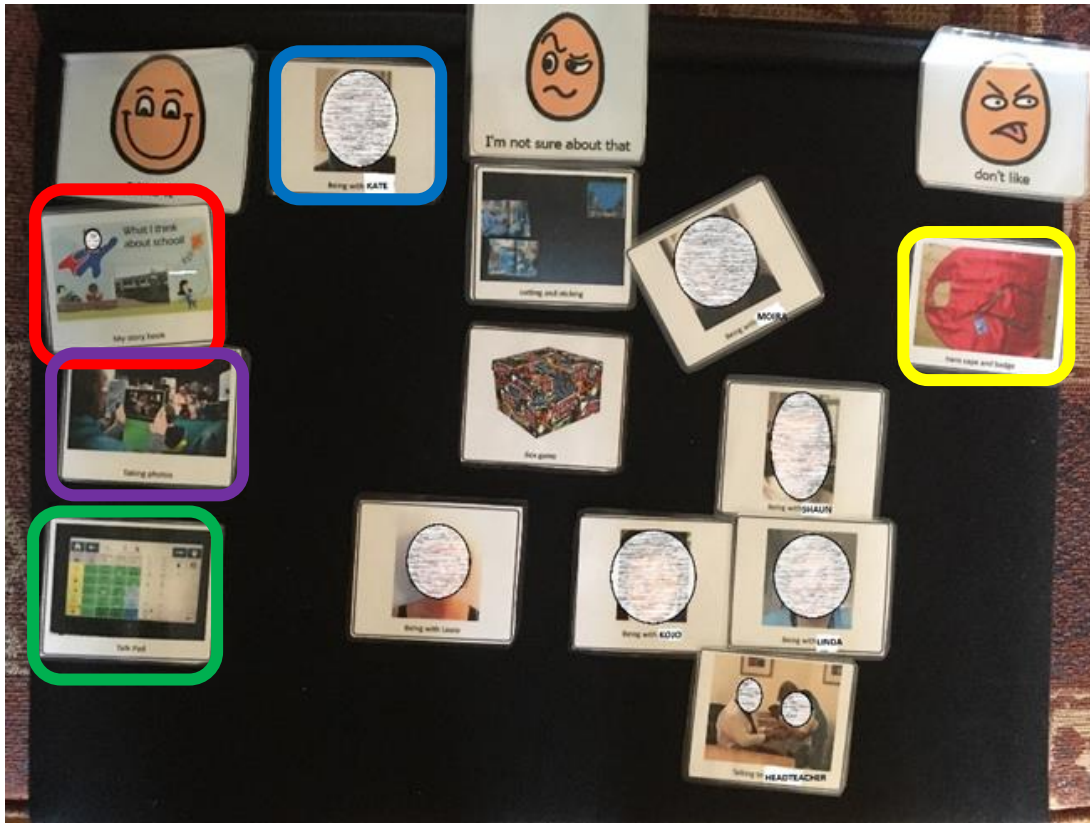


Figure 5.13: Cai's interview – 'perception of AAction Heroes'

Cai placed all group members (other than Kate) quite quickly in the centre of the mat, below 'I'm not sure about that'. This suggests that Cai valued being able to work closely with a different adult, Kate (he would usually be with Moira), but was somewhat indifferent about working in a group with his classmates and other adult participants.

Cai viewed his VOCA positively and when asked how he felt about using his device he placed the picture definitively under 'things I like symbol' without hesitation (highlighted green in figure 5.13.). Cai also expressed his enjoyment of taking photographs (highlighted in purple in figure 5.13.) which was unsurprising as he visibly enjoyed this activity in the sessions and spent a lot of time focussing on this task. Cai valued his storybook which was an encouraging finding as the co-creation of his story was central to the approach and the tangible storybook (rather than PowerPoint) format was intended to fit with his preferences (highlighted red in figure 5.13.).

Cai frequently moved around and lost interest in the structured 'box games' at the beginning of each session. This task required him to listen to the opinions of the other child

and adult participants and though he did take part at times he clearly preferred more independent tasks. Unsurprisingly, he placed the photograph of the box games in the 'not sure' area of the mat. Similarly, he placed 'talking to the headteacher' in the 'not sure' area.

Cai never wore the ID badge or cape and clearly did not value this activity which he expressed clearly in his interview through placing the photograph definitively under 'did not like' (highlighted yellow in figure 5.13).

I was surprised that Cai was unsure about collaging as during the session he spent a lot of time making his collage. It may be that Cai felt collaging was not as enjoyable as taking photos and creating his storybook. Cai declined to talk about any of the issues further using his AAC device and when asked if he had anything else to say pushed the mat towards me as if to say; "I've finished".

Though different participants valued different activities for different reasons, it was the flexibility and range of available activities that appeared important:

Linda: I'd take them [AAction Heroes activities] all because we'll have such a varied group that communicate in very different ways. They may not have the words or the symbols of whatever they want but they may be able to communicate that in a different way. So, they could go and take photographs, go and take something that they really like or don't like or who they like.

The global theme 'Participating in AAction Heroes' reveals that Cai valued different elements of the approach to the adult participants. Further, there was a difference in opinion between the adults in terms of what elements they found helpful. Nevertheless, there was largely agreement in the value of reflective practice and interacting differently with children who use AAC.

5.5.3. Thematic network 3: Imagining the Future

This global theme encompasses the participants' views on what changes could be made to the AAction Heroes approach in the future, as well as any changes they had made, or could envisage making, to their general practice. Figure 5.14. illustrates the four organizing themes and related basic themes which contribute to this thematic network.

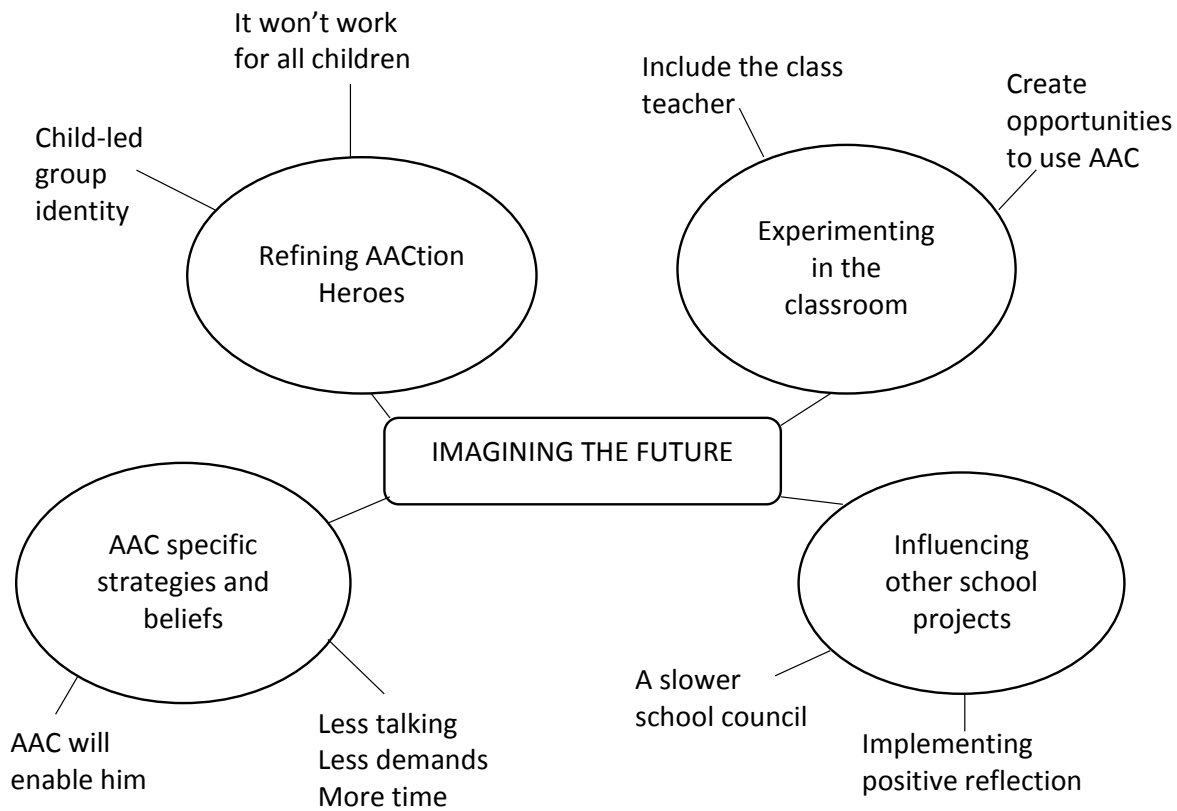


Figure 5.14: Thematic network 3 Global theme – Imagining the future

Organizing theme: Refining AACtion Heroes

As previously discussed, none of the child participants valued dressing up as action heroes in the main study. Aside from this aspect, participants largely agreed that the structure and activities in the AACtion Heroes approach were appropriate. Nevertheless, although the adult participants were generally positive about the AACtion Heroes approach there was some disagreement and contradiction in their views about which types of children would benefit from taking part in the future.

Moira felt that older children may benefit from the approach more than this group who were aged between 8 and 11, as they would be able to understand and engage more fully in discussions about their opinions.

Laura: So where [age and stage] would you put this approach?

Moira: 12 and 13

Laura: So that slightly step older?

Moira: Yeah. Because if you think of mainstream there's not many 8 and 9 year olds that could give you an opinion.

Laura: Mainstream kids?

Moira: Well maybe they could give you an opinion. But what am I trying to say? They're not as developed. Mentally and emotionally as 11 to 13 - 14 year olds.

Laura: Yeah so you think those 11 to 14 year old would be more able to have those discussions?

Moira: Yes, because they're more socially and emotionally developed.

Moira explains her perspective through comparisons with the abilities of mainstream children. However, her view surprised me as generally children with typical development should be able to express their opinion at a much younger chronological age than the child participants in this study. It was common in the interviews for the participants to use mainstream or typically developing children as comparisons (see Kate's comparison with young children learning to walk in section 5.5.1.). However, such comparisons are not

always helpful as children with CCN are not simply developmentally delayed children. This may explain why there was no consensus between the adult participants on which children would benefit from the AACtion Heroes approach. Conversely to Moira, Kate felt she could use the approach with younger children as she was going to be in a Foundation phase class with 3 to 5-year olds in the following school year.

Kate: I think it will work because I'm with little uns' next year and in a way that's how they lead their lives at that age because its exploring and letting them make the mistakes and finding the things that they like and don't like.

Linda felt the approach could benefit any child with communication needs. She also expressed surprise that all of the child participants could express an opinion.

Linda: I naturally have quite high expectations of pupils, but I wasn't expecting them to produce as many opinions as they did. I didn't expect it to be as definite and as quick as what it actually turned out to be, producing their own opinions through the pictures and the photographs. They could clearly show what was important to them.

As well as suggesting she might be able to use the approach with the younger children, Linda had also made plans to try the approach with an older group of children.

Laura: Do you think it might be easier with the older ones? Or just different?

Linda: I think it'll be different. I'm not sure it'll be easier because I think some of them might have some quite big, big things they want to deal with.

For Linda, the age and stage of the participating children was not important, but the nature of the opinions they express may be different. For example, Cai was interested in books and by extension the library, which meant he was bothered by missing books from the school's collection. It may be that an older child has "big things they want to deal with" such as the way the school is managed or societal views of children with disabilities. This organizing theme suggests that the success of the AACtion Heroes approach does not map neatly on to chronological age or developmental stage of the child participants. Other factors relating to child specific needs and preferences need to be taken into account, both in terms of the child who uses hi-tech AAC and their participating peers. However, 'who AACtion Heroes is for' also appears to be related to adult perceptions of children's ability, both in general and specifically to these children, and different perceptions of what constitutes an expression of

opinion. For example, is it a child's ability to engage in a discussion, watching them explore and extrapolating their likes and dislikes, or showing what's important through pictures and photographs?

Organizing theme: AAC specific strategies and beliefs

This theme illustrates the adult participants' beliefs about AAC in the future. This included: how AAC will affect the user (Cai); how AAC technology itself will develop; and how they (the adult participants) will respond in AAC interactions in the future. Cai expressed his like of his hi-tech AAC device in his interview (see figure 5.13.) and it appeared that all adult participants also viewed hi-tech AAC positively, seeing it as beneficial for Cai's communication in his present interactions as well as its future potential.

Kate: Yeah because [previously with low tech AAC] you're not building too much of a sentence structure whereas now he's [Cai's] got a plethora of like in between words to really build a full complete, its language like we're talking now. It will enable him, it will once he grasps it which I'm sure won't be long, he could full on be having conversations.

Kate views hi-tech AAC as the medium through which Cai will learn "complete" language which has "structure" and mirrors spoken language. However, the promise of having a conversation remains in the future as Cai needs to "grasp it", learning to become increasingly masterful of the device. Kate believes that Cai has quickly learnt to use a more complex device/software than he had previously and extrapolates that it "won't be long" before he is using more complex sentence structures. Kate views Cai's future learning potential with hi-tech AAC positively.

Linda spoke about her role as an AAC teacher and how the experience of participating in AAction Heroes would impact on her future interactions with pupils who use AAC: "I actually wrote three things down: Less talking, less demands and more time." This succinct message is an encouraging outcome as it suggests Linda has reflected on how her own communication impacts children who use AAC and has expressed her intention to adapt her behaviour, in her own words. Moira expressed her intention to expand the topic of her conversations with children who use hi-tech AAC:

Moira: Is there anything I could use? I think the idea of finding out what they think. What do *you* think of this?

Both Linda and Moira identified how they would change their own interactions. However, Kate talked generally about how she would like to use the approach in the classroom environment with the caveat that its success would depend on the teacher: “I think it is a nice approach to have in the classroom but it’s finding the right teacher.” The question of who has the power to implement the ideas and strategies in the AACtion Heroes approach and how this could be done in the future was a recurring theme in this data set as illustrated by the next organizing theme.

Organizing theme: Experimenting in the classroom

This theme encompasses what elements of the AACtion Heroes approach the adult participants could envisage being used in the classroom, and what conditions would have to be in place for it to be a success in the whole-class environment. Kate felt she had noticed a difference in Cai’s communication in the group and she had subsequently created more opportunities for him to use his VOCA in the classroom.

Kate: Yeah and we’ve applied stuff, especially in things like circle time, trying to nail all of the things he can ask, you know. And it’s building his confidence, because sometimes he lacks the confidence of where things are, but actually he does know where they are and it’s fine you know, we’re all learning it together.

It was encouraging to see that Kate valued Cai’s use of hi-tech AAC in the AACtion Heroes sessions and could see it being useful beyond the parameters of the group context. Circle time is used widely in schools as an opportunity for pupils to sit together and talk about issues as a class with the aim of “increasing awareness of themselves and of others; raising self-esteem; and promoting mutual trust, listening skills and positive interpersonal behaviours” (Canney and Byrne, 2006, p. 20). A small group discussion with the aim of asking peers questions (and listening to their answers) mirrored the structured group activities at the beginning of each AACtion Heroes session. It is positive to see that Kate was able to facilitate Cai’s use of his AAC device in this similar, class-based forum. Further, she perceives learning to use the device as not just a task for Cai but something “we’re all learning together.”

Linda also believed elements of AAction Heroes could be applied in the classroom, but emphasised it would be essential to involve the class-teacher in the AAction Heroes group to achieve carryover.

Linda: Even though it was child-led you [the researcher] were controlling the adults as oppose to controlling the children in what you wanted them to do, and I think that is very good for staff [teachers] to see. [...] To look at somebody who *isn't* a teacher manage a situation and manage a session gives you a very different perspective on things so I would definitely include the teacher in it.

Linda perceives “controlling the adults” as being vital to achieving a child-led environment. For her, this involved intentional facilitation and instruction of the adult participants which in this study was implemented by me. It follows that for the same thing to be achieved in the classroom, another facilitator would have to take responsibility for telling support staff what was required and what the goal of a child-led activity might be. This is typically the class-teacher. Linda is positioning the involvement of class-teachers in the AAction Heroes group as a learning opportunity for them whereby they could take elements of the approach to the classroom. Although AAction Heroes was not specifically designed for use in the classroom, it is encouraging to see that adult participants valued the experience and could see its potential for more general use.

Organizing theme: Influencing other school projects

This theme includes how AAction Heroes has influenced other school-wide projects in the school through influencing the creation of an advocacy group and providing an argument for implementing reflective practice in classrooms.

As previously discussed, the adult participants viewed their experience of reflecting on the sessions positively. Moira felt regular reflection would be both an achievable and useful thing to implement as a group of classroom staff, “everybody come up with something positive that happened that week and I think that would be a good way to end a week in the classroom”. Linda had some specific ideas about how this type of whole class staff reflection could be implemented, drawing on the tools utilised in the AAction Heroes approach.

Linda: And you had specific questions. The questions you did I think that was a brilliant way of doing it rather than having an open book.

Laura: Yeah it could get a bit, too expansive a chat, it was already quite tricky wasn't it getting it done in half an hour.

Linda: But I think having those questions, maybe it's something that we can use. In fact, I might have them off you.

Laura: Alright then!

Structuring the reflections using the crib-sheet (see table 3.4.) was perceived positively. It kept the reflection focussed and may have contributed to Linda's assertion that "building a time to do that" would be achievable. Moira felt it would be a "good way to end a week in the classroom" and spoke generally how it could be used by class staff, whilst Linda positioned it as suitable for classes "where they are using alternative communication". This likely reflects their differing roles and concerns as LSA and AAC specialist teacher respectively, but it is encouraging to see both participants would like to implement future reflective practice.

Linda was also involved in implementing and facilitating other school-wide projects such as the school council and spoke about how AAction Heroes had inspired her to try new approaches. The school council includes children from across the school who can bring up any issues on behalf of the pupils and advocate changes. However, it largely included pupils with strong communication skills. Linda described how she had been involved in setting up a slower-paced advocacy group for children with cognitive and communication challenges.

Linda: if they did join the school council it would be great, but it takes them so long to get their opinion across that the school council would have finished. So it's really difficult for them. So, we wanted to do a spur off that.

Laura: So perhaps giving them more sessions similar to this rather than just one discussion at a school council. It's a slow build.

Linda: And you give them the time then between the one session and the following session to say we may not have had the time to finish this now but you can work with lots of people between now and then, come back with some more ideas and we'll follow it up and we'll follow on from what you've done as oppose to having a

new agenda so if it takes us six weeks to get something out as oppose to a week then so be it.

It is encouraging to think that participating in AACtion Heroes allowed Linda to influence other school projects and broaden inclusion for pupils who use hi-tech AAC or means of expression other than speech. The idea that AACtion Heroes is a departure from typical ways of being and doing in the special education setting permeates the data set. However, it does appear to map on to specific school activities such as circle time and the school council, albeit with certain adaptations for those who use AAC. This data has shown that, in the education setting, staff need to intentionally plan and implement opportunities for children to lead. It is a contradictory situation in which adults are required to take the lead to be child-led.

The global theme 'Imagining the Future' reveals the participants' views of the future impact of AACtion Heroes. Their ideas included what changes could be made to the approach, how they could adapt their AAC mediated interactions, the future of AAC, as well as broader applications of the AACtion Heroes ethos in classroom activities and whole-school projects.

5.5.4. Summary

The thematic networks illustrate how AACtion Heroes differs from the existing school system; the participants' experience of participating in AACtion Heroes; and potential future applications it could have. Adults spoke about the existing school system and the established ways of being with, supporting, and interacting with children with SEND including those who use hi-tech AAC. The experience of participating in AACtion Heroes was viewed differently by each individual adult and child participant, with views on the approach being as varied as the people who hold them. This may reflect their different roles within the education setting, as well as their personalities. Overall, the AACtion Heroes approach was viewed as a challenge to everyday practice. However, the adults appeared to value the opportunity to experiment with being child-led within the parameters of the research project and could envisage how elements of the approach could be applied in the future. For Cai, it appeared to be a welcome opportunity to use his communication aid, interact

with other adults, and try new activities such as photography. Importantly, Cai valued his storybook. Whether he valued the completed artefact, or the process of co-creation is unclear. Nevertheless, the co-creation of storybooks appeared to have value for the adult participants and for a child who uses hi-tech AAC and may have potential for use in the special education setting.

6.0. Chapter 6: Discussion

6.1. Introduction

This research is underpinned by a commitment to children's rights (United Nations, 1989), and focusses on their right to express their ideas and be taken seriously (Gillett-Swan and Sargeant, 2018; McLeod, 2018). The research contributes to realising the rights of children who use hi-tech AAC and their peers with CCN through the development of AACtion Heroes. This child-led, group approach aims to enable children with CCN to voice their views and make changes in their special education setting by co-creating personal storybooks with adults who know them well. It draws on various disciplines including sociology of childhood (James and Prout, 2014), participatory action research (PAR) with typically developing children (Clark et al., 2011; Clark, 2017) and children who have CCN (Wickenden and Kembhavi-Tam, 2014; Ajodhia-Andrews, 2016), and participatory research with children who use hi-tech AAC (Wickenden, 2011a; 2011b; Batorowicz et al., 2014; King et al., 2014; Hynan et al., 2014; 2015; Midtlin et al., 2015; Caron and Light, 2017; Howery, 2018; Teachman and Gibson, 2018; Teachman et al., 2020). AACtion Heroes contributes to the available approaches that adults could utilise for hearing and acting on the views of school-aged children who use hi-tech AAC and their peers with CCN in the special school setting.

In the main study, AACtion Heroes created a quasi-naturalistic child-led context within a special education setting so that the consequences and potential for being child-led could be analysed and explored (Heath and Luff, 2018). The visual ethnographic approach taken addressed both co-creation and co-construction processes. Therefore, the findings offer broad ethnographic insight into the experiences and practices of co-creating a storybook with a child who uses hi-tech AAC, as well as detailed, visual, investigation into the minutiae of interactions with various interlocutors. The broad ethnographic exploration into co-creation processes contributes to what is known about participatory approaches for hearing the views of children who use hi-tech AAC (Wickenden, 2011a; Teachman and Gibson, 2018). Whilst the detailed investigation of co-construction processes contributes to the small body of literature detailing interactions mediated through hi-tech AAC in the special education setting (Clarke and Wilkinson, 2007; 2008; 2009; Solomon-Rice and Soto, 2011; Norén et al., 2013; Clarke et al., 2017; Savolainen et al., 2020; Tegler et al., 2020). I

will now present a comprehensive debate of the findings, discussing the relevant literature which are related to this study's research aims and research questions. The chapter is structured in four parts. The first three sections will explore the implications of the findings of the study in relation to the research questions, whilst the final section will discuss the limitations of the study.

6.2. Research questions

1. In the process of personal storybook *co-creation* (over six weeks) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?
2. In the process of message *co-construction* (in seconds) what visible actions, talk and material artefacts are observable in the interactions mediated through hi-tech AAC?
3. What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use hi-tech AAC and their peers?
4. Is co-creating children's personal storybooks (AAAction Heroes) a viable way of working with children who use hi-tech AAC in the special education setting?

6.3. The co-creation of personal storybooks with a child who uses hi-tech AAC and his peers with CCN

Research questions 1 and 3 are concerned with the process of storybook *co-creation* over six weeks. As only one child participant in the main study (Cai) used hi-tech AAC, it was only possible to address research question 1 with a single-case of co-creation processes mediated through hi-tech AAC. However, personal storybooks were co-created with all the child participants therefore it was possible for the adult participants to reflect on what they needed to contribute to facilitate co-creation with Cai and his peers with CCN (Kojo and Shaun). Research question 1 relates to my perspective on the six-week process and focusses on the talk, visible actions and material artefacts which were observable in the participants interactions. Research question 3 relates to the adult participants' perspectives on what they needed to contribute to the process of co-creation. In this section, storybook co-creation will be discussed in detail with reference to the existing literature and through merging the findings of my personal video-ethnographic account and the framework

analysis of adult participants' ongoing reflections. This is to ensure that various perspectives on the process of co-creating storybooks with a child who uses hi-tech AAC and his peers with CCN are represented in this discussion. The section of the discussion is presented under the following sub-headings: Co-creation with creative and visual methods; Adult contributions to co-creation; and Peer contributions to co-creation.

6.3.1. Co-creation with creative and visual methods

Multi methods for multi-modal communicators

Creative and visual methods such as photography and drawing have been used by researchers to explore the views of children who use hi-tech AAC in participatory studies (Wickenden, 2011a; King et al., 2014; Teachman and Gibson, 2018). Researchers have found that providing a choice of multi-methods is important for supporting children with CCN to participate in research about their lives (Wickenden and Kembhavi-Tam, 2014). This study has similar findings. Notably, the children who participated in the pilot study utilised drawing to support their discussions. Conversely, the children who participated in the main study did not use drawing despite it being on offer. Across both studies, every child engaged with taking photographs and appeared to enjoy choosing, cutting, and sticking images in the collaging activity. Various children across the pilot and main study used low-tech symbols to express their views. For example, despite being a hi-tech AAC user, Cai also utilised the low-tech AAC symbols provided to choose where in school he would like to take the adults:

He [Cai] stood in front of the symbols, occluding Shaun and Moira's view of the board and flicked one of the symbols with his left hand.

Linda craned her neck but couldn't see the board properly. "What's he pointing to?" she asked nobody in particular.

Moira was sat next to her, "the library."

Linda and Moira smiled at each other in shared recognition, "the library."

(excerpt of video-ethnography)

Low tech symbols were not appropriate for all children, for example, "Shaun needs real objects on a clear background because of his visual impairment." (Kate, session 1) (5.4.2.).

The participating children used different material artefacts in their interactions which, as Wickenden and Kembhavi-Tam (2014) suggest, may reflect the strengths and preferences of the participating children, rather than the suitability of the methods *per se*.

Furthermore, children who are learning to become aided communicators typically have a history of communicating via multi-modal means before they receive their formal AAC system (von Tetzchner and Grove, 2003). Therefore, multi-modal communication may be a pre-existing strength for children who use hi-tech AAC and multi-modal methods may complement their existing skills and abilities.

Photography

Although the argument for a multi-methods approach for children with CCN is strong, across the pilot and main study, photography stood out as appealing to all children. Photography (including taking photographs themselves and using them in the collaging activity) appeared to be accessible and enjoyable for all the children who participated. For example, Cai appeared to be highly familiar with taking photographs on an iPad which was evident from his visible actions:

Cai began scrolling through the photos on the device.
“Oi cheeky!” said Linda “there’s all sorts of stuff on there!”
Cai smiled and returned to the camera app.
(excerpt of video-ethnography)

Furthermore, Cai clearly expressed his like for photography in his interview (4.5.2). Eisen *et al* (2019) conducted a literature review of participatory studies (n=19) which used photography with children with a range of disabilities and found that it was particularly successful for those with communication disabilities (Eisen et al., 2019). The authors do not expand on the details of why this was the case but previous research with children who use hi-tech AAC highlighted that photographs allowed the children to set the topic for discussion and talk about things that were difficult to articulate (Teachman and Gibson, 2018). Similarly to AAC narrative intervention, it may be that the adult researcher could ask open-ended questions related to the photograph to elicit more information than would typically be possible (Solomon-Rice and Soto, 2011). In this study, photography was the only medium used successfully by *all* the children who participated both in the pilot and the main project. Taking a photograph appeared to be a familiar activity for the child participants and many did so independently. Eisen *et al* (2019) claim that it is possible to modify access to photography for a diverse range of children. Likewise, in this study, it was relatively easy to

modify accessibility for all children who used AAC including those with physical difficulties. Participants who used hi-tech AAC could use the same device to take photographs, thereby using any access methods (e.g., device stands, switches, eye-gaze) that were already in place for their AAC system. Photography would seem a promising method both to facilitate the inclusion of children with CCN in participatory research, and for exploring their views in the everyday special school setting. Implications for future research and practice will be summarised in the following chapter (7.2 and 7.3).

Repeated opportunities to participate

Previous studies have shown that it is important to offer extended time periods and multiple opportunities for children who use hi-tech AAC to engage in participatory research methods such as interviews (Batorowicz et al., 2014; King et al., 2014; Teachman and Gibson, 2018). Furthermore, multiple opportunities to engage with multi-methods may complement, rather than replicate findings, and allow children with CCN to express a different aspect of their experience or view (Ajodhia-Andrews, 2016). In this research, repeating the activities was integral to the co-creation of children's storybooks. That is, repeated opportunities to engage in multi-modal activities allowed the children to piece together their personal storybooks using their preferred methods, at their own pace, in a process of slow knowledge building. To some extent, repeated opportunities to engage with activities also mitigated the effects of children's absence from the sessions. For example, main study participant Shaun completed a storybook despite missing session 4 as he had multiple opportunities to take photographs and discuss his views within a collaging activity in session 3. Repeated opportunities to explore and express one's views may be particularly important in a special education setting where child absence is more common than in the mainstream setting (Hatton, 2018).

Ownership and team identity

In previous PAR studies involving children with CCN, researchers note that children valued having ownership of the research resources such as cameras (Wickenden and Kembhavi-Tam, 2014) and kits including a journal and pencil case (Ajodhia-Andrews, 2016). In this

research, children in the pilot and main study were given a kit comprised of: action hero cape, pencil and pencil grip, action hero notebook, low-tech AAC symbol cards, and a photo ID badge (see figure 3.3.). The research kits were intended to be tangible, material artefacts representing the children's ownership of the research (Wickenden and Kembhavi-Tam, 2014; Ajodhia-Andrews, 2016). However, in this study, the children's response to 'ownership' and use of these material artefacts was mixed. That is, the pilot study participants wore the capes and showed their ID badges proudly to other adults around the school, whilst the main study children did not show any interest in the kits and did not want to wear capes or ID badges. Notably, main study participant Cai clearly expressed that he did not like the action hero cape and ID badge in his Talking Mat™ interview (see figure 5.14.). As suggested by the adult participants in the main study (5.4.2.), it may be that allowing children to choose their own group identity (e.g., cars rather than action heroes) would facilitate the children's ownership of the research sessions. Despite the mixed response to the research kit, giving the children a choice of whether to wear capes and badges, and respecting their choice, was a useful means of showing children that their views were being respected by adults. In this way, material artefacts offered adults a means of actioning 'optional' (4.4.3.): demonstrating to children, rather than explaining, that they could say no.

6.3.2. Adult contributions to co-creation

The ethics of co-creation and 'tidying-up' children's stories

As discussed in the literature review (2.3.14) adult participatory researchers may need to interpret and 'translate' the views of children who use hi-tech AAC so that their perspectives (expressed via multi-modal means) can be understood by others. In this study, the use of visual media such as child-led photography necessitated the need for adult participants to write text alongside the image so that the children's story could be understood by others. Ajodhia-Andrews (2016) reflects on her experiences in conducting participatory research with children with CCN and highlights that "it was necessary to revise and, in a sense, 'tidy up' the data to support reader's understandings of the participant's perspectives" (Ajodhia-Andrews, 2016, p. 279). Similarly, in this study, the children's photography alone would not relay their views to others, and I wrote grammatically clear sentences in the child's first-

person narrative alongside their images. The orthographic gloss was not necessarily in line with the children's receptive and expressive language levels (i.e., likely exceeded their current language skills) but reflected what they had expressed in multiple, multi-modal interactions. For example, Cai's photographs were presented alongside a sentence: "My favourite place in school is the library because I love books" (Cai's storybook, page 2). This is a 'tidied up' single sentence – my interpretation of the views he expressed in a series of interactions utilising talk (AAC utterances), visible actions, and material artefacts throughout session 1. This could be positioned as problematic as it was my interpretation of Cai's views which I then 'voice' in a sentence form that he has not used. I reflected on this tension throughout the study but believe it was necessary to present Cai's views to others in a coherent way. I tried to be a conduit for raising his ideas with a larger audience, using sentences that could be understood but still, in a sense childlike, avoiding complicated vocabulary or complexity of form, and still written in the first-person perspective. Encouragingly, in the participant interview, Cai reported that he liked his storybook (4.5.2.) which may suggest he was happy with my interpretations. Certainly, I endeavoured to achieve this; every week Cai reviewed his storybook and I watched his reactions carefully, attempting to pick-up on anything he disagreed with or did not understand (Dockett and Perry, 2007). Nevertheless, this is not a perfect appraisal system and it is possible that elements of Cai's story were misrepresented despite my efforts to genuinely listen to him. Furthermore, this has implications for the replicability of AACtion Heroes as this process needs to be approached in a similar, child-led and self-aware way by the person who is facilitating the group.

Participatory researchers frequently wrestle with the concept of how child participants are represented through images and text (Phelan and Kinsella, 2013) and there is general consensus that imbalances of power between the adult researcher and the child participant can never be fully reconciled (Alderson and Morrow, 2011). In this regard the participatory researcher's only recourse is reflexivity and the ongoing consideration of 'how do I know what I know?' (Phelan and Kinsella, 2013). Accessing and representing the views of children who use AAC is messy. Rix *et al's* (2020) systematic review of participatory studies involving adolescents and adults with learning impairments concludes, "participation is not about types of activity but how any activity is undertaken" (Rix et al., 2020, p. 1031).

To echo this sentiment, I found that the methods themselves reached their potential when they were approached in a spirit of genuine curiosity about the children's ideas with continuous reflection on what they were trying to say. Furthermore, adult participants' ongoing reflections on how to adapt resources and activities (4.4.2) in response to the children's reactions week-to-week ensured that children's views, rather than the methods, were forefronted.

Multi-methods, like AAC systems themselves, are a means of hearing children tell their story. The child's story is the element of interest and in the process of co-creation adults must continually reflect on how they know what they know and if their "tidying-up" is both helpful for the aim – it helps the child to communicate their view to an external audience – and yet remains genuinely representative of the child's view.

"Plan furiously, then don't worry too much when it goes off plan!"

There were many occasions across the research project where meticulous planning of a session had to be abandoned because of external circumstances relating to school life or the individual choices of the participating children. Eventually, I learned to accept and even enjoy this experience. I saw this process as related to needing to leave my SLT self 'at the door' and enter each session with the principles and practices of a participatory researcher. The principles and practices of a participatory researcher may have much to offer the practicing SLT who wishes to take a child-led/rights-based approach. Gallagher *et al* (2018) argue that SLTs need to take a different, rights-based, approach to working in schools that acknowledges and develops children's agency, rather than seeking to 'remediate' their communication impairments. The authors highlight three broad ways SLTs might achieve this: listening to children with CCN, collaborating with teachers, and providing multi-modal access to curricular tasks which acknowledges children's capabilities (Gallagher *et al.*, 2018). This research study is also underpinned by an acknowledgement of children's rights and expands on Gallagher *et al's* (2018) commentary by offering real-world insight into what taking a rights-based approach might look like for a SLT in a school setting. For example, as a participatory researcher-practitioner, I learned to view familiar resources and situations differently. As a SLT I would have prompted the children through the (compulsory) planned activities using visual supports to remind them of the schedule; as a researcher-practitioner

I used visual supports to explain what choices were on offer and respected the children's choice to not participate. At times, I carried on with a 'group' activity when only one child was engaged in it. 'SLT Laura' may have looked to the LSAs to re-engage the child with the task; 'researcher Laura' explicitly asked them not to. Consequently, I learnt to trust children's innate willingness and desire to engage in interactions; a desire that was present despite medical diagnoses (e.g., ASD) that imply difficulties and even avoidance of social interaction. As illustrated by Cai's visible actions in the following example:

Cai stood a metre or so behind the group switching his gaze from the classroom wall to the symbol board whilst rocking a chair back-and-forth. In one moment, he brought his right index finger to his lips and walked into the circle. He stood in front of the symbols, occluding Shaun and Moira's view of the board and flicked one of the symbols with his left hand.

(excerpt of video-ethnography)

For me, respecting and developing children's agency was tied to the process of going 'off plan': being led by the children was one of the most rewarding experiences of participating in AAction Heroes.

Nevertheless, I was struck by comments from the other adult participants when they referred to the sessions as 'unstructured'. As the sessions unfolded, it perhaps appeared to them as if there was no strict plan:

You know you've got your teaching plans you've got to stick to them whereas if you take someone out of that who is not having to do all of that structure it almost gives you a more relaxed attitude to stuff.

(Linda, interview transcript)

In reality, I planned each element of the AAction Heroes sessions with more consideration and structure than my typical SLT intervention sessions. From my perspective, allowing children to choose did not mean that structure was abandoned: quite the opposite. More planned activities were available to provide a choice, more multi-modal resources were provided to support the diverse communication needs of the children, more visual supports were required to aid understanding of what was available, and clear and repeated communication with adult participants about the goal of the activities was essential.

Gallagher *et al* (2018) argue that a rights-based approach for children with CCN requires that a "variety of learning and teaching options are designed from the outset of planning, to

consider diverse learning needs within a classroom” (Gallagher et al., p. 131). Similarly, in AAction Heroes, a choice of multi-modal activities was planned to ensure that the children’s perspectives and ideas remained central, whilst the activities and tasks were suggestions, not prescriptions, for how they might express themselves. Arguably, this requires more planning than a typical intervention or lesson for children who use AAC. Then, after all this effort, you must be comfortable with the children’s right to exercise their choice when they encounter your best-laid plans.

Linda: I think it’s important that we as teachers realise that you can almost forget the lesson plan. It’s an awful thing to say but forget the lesson plan.

Laura: Well, it’s plan furiously and then don’t worry too much when it goes off plan!
(Linda’s interview transcript)

Planning furiously and learning to go off plan is central to the process of being child-led. Without planning a variety of multi-modal options and respecting children’s choices it would not have been possible to explore the views of children who use hi-tech AAC. Thus, bearing in mind the discord between the adult’s perceptions and the reality of planning this approach, it would be beneficial to adapt the way in which AAction Heroes was explained to the adult participants. Recommendations for adapting AAction Heroes will be discussed in more detail in the following chapter (7.1).

Adult reflection through mediated dialogue

As evidenced by the Framework Analysis (5.4) the process of co-creation relied heavily on the multi-faceted contributions of the adult participants and was influenced by the culture and expectations of the wider special education setting. Therefore, although not strictly observable in the ‘online’ process of co-creating a storybook, the reflection sessions with the adult participants were integral to the process. From my perspective, listening to the adults was fundamental to the process of listening to the children. The reflection sessions were at the heart of understanding the perspectives of the adult participants. This took time. After two to three weeks the beliefs and motivations underpinning the adults’ actions, behaviour and talk in the child-led sessions were illuminated through dialogue in the reflection sessions. I was then able to facilitate the adults more effectively and help them

feel more comfortable in being child-led. Encouragingly, all of the adult participants viewed the reflection sessions positively and welcomed the idea of increased reflective practice in the future (5.5.3). Having the crib-sheet with various questions to consider was a way of structuring the reflection sessions so that actions for the following week could be identified in a timely manner. Further, it may be that having the tangible artefact (crib-sheet) as a focus for the discussion was integral to achieving a sense of safety and a non-judgemental atmosphere that was reported by all of the adult participants.

The idea that a tangible artefact can facilitate dialogue within participatory and/or action research is known as mediated dialogue (Palus and Drath, 2001). Palus and Horth (2014) argue that artefacts such as photographs or artwork can provide a central and shared focus for group discussions, allowing comments to arise in relation to the artefact rather than from a sense of self which can feel threatening: the artefacts “can form a neutral, safe territory for talk” (Palus and Horth, 2014, p. 2). Although these comments are in relation to creative artefacts such as objects and artistic images, it may be that the crib-sheet in this study performed a similar role. The participants could begin to discuss their ideas and observations with reference to the crib-sheet, rather than independently raising potentially contentious issues. This may have been particularly helpful for the adult participants in this study who were part of a hierarchical school system. The power dynamics were well-established even between adults with the same role: Moira was a very experienced LSA who literally held the title ‘higher-level LSA’, whilst Kate was relatively new to the role. Linda was a specialist AAC teacher with management level responsibilities, and I was the PhD researcher who instigated the project. It is understandable that participants may have found it difficult to raise their opinions within this power structure. Similarly to Palus and colleagues, I believe that the material artefact (crib-sheet) allowed a temporary disassociation from one’s views so that the opinion could be held up objectively to the group (and the self) and explored, rather than interrogated, allowing a constructive general consensus to be reached (Palus and Drath, 2001; Palus and Horth, 2014).

From my standpoint of the facilitator and researcher, the crib-sheet made my dual role easier. I could highlight a sentence on the crib-sheet, rather than raise a seemingly novel and potentially contentious observation, as well as focussing on recording the other participant’s views in real-time. The act of writing was a means of physically showing that I

was listening carefully to what was being said. Subsequently, any questions I then raised could be perceived as driven by the desire to faithfully record their views, rather than a challenge to their ideas. Ultimately, the participants were involved in my PhD project and any criticism they had of the strategies and approaches would be difficult to raise if I appeared to take them personally or disagree. In the reflection sessions, I had to balance the tension between my different roles: the leader conducting the PhD project; the facilitator creating an environment for shared dialogue; the expert who was knowledgeable about communication and AAC; and the novice student exploring an idea. To some extent, the crib-sheet allowed me to reconcile my multi-faceted identity. Palus and Horth (2014) argue that shared orientation to a visual artefact can create a context for shared and equal inquiry.

It [the artefact] shifts the practice of leadership from the 'person in charge' to a practice that is shared and owned by the group—people talking, thinking, and acting together in the face of their complex challenges to create shared direction, alignment, and commitment.

(Palus and Horth, 2014, p. 2)

Similarly, the crib-sheet provided a focus and structured the group's discussions and became a record of their shared decisions and solutions for the following week. Further to this, for me, the crib-sheet was a resource for reminding me to quieten the 'leader' and the 'expert' and engage the 'facilitator' and curious novice 'student'. It helped me navigate this new territory and was invaluable in helping me understand diverse perspectives and the reasons that individuals with seemingly similar roles experienced and viewed events very differently.

[Peer contributions to co-creation](#)

As discussed in the framework analysis (4.4.3) adult participants highlighted the challenges in facilitating peer interactions in the main study. School-aged children who use AAC have restricted social interactions with peers compared to children their own age without communication impairments (Raghavendra et al., 2012). Though school offers a context for children who use AAC to interact with peers, it has been reported that peer interactions remain limited (Clarke and Kirton, 2003) with children predominantly interacting with adults

in supporting roles (Chung et al., 2012). This may be particularly true of children in a special education setting where time taken for personal care needs further impacts on social participation opportunities with peers (Raghavendra et al., 2012). However, when children who use hi-tech AAC are given the opportunity to interact with naturally speaking peers, studies of dyadic interactions suggest that their interactions differ from those with adults (Clarke and Wilkinson; 2007; 2008; 2009). For example, they include laughter and humour as speaking peers treat the child's non-verbal gestures and AAC utterances as playful and mischievous, which establishes a bond and friendship that is different to the child's relationship with adults (Clarke and Wilkinson, 2009). Through analysing the pilot study data, I had hoped that AACtion Heroes would foster peer interactions for children in a special education setting. That is, not just with naturally speaking children, but their peers with CCN in their specialist education classroom. In the pilot study video data, the children frequently looked and smiled at each other. AAC teacher Linda (who participated in both the pilot and main study) also noted the children's social interaction:

Linda: the fact that they could work together and feed off each other and share some ideas, so that the ones that are perhaps not quite so confident, they got some ideas and started thinking hmmm actually I can develop my own.

(Linda, pilot study interview transcript)

I theorised that the children benefitted from peer modelling and support in the pilot study research activities and that AACtion Heroes may have provided a small group context which previous studies suggested were more facilitative of peer interactions than whole-class or large groups (Chung et al., 2012). Further, the low-tech AAC users in the pilot study took an interest in their peer's use of a hi-tech AAC system and even worked together to co-construct an invitation to the final presentation using the child's hi-tech AAC system. This is perhaps best summarised by the enthusiastic email I received from Linda:

Linda: I know there is loads of repetition in it [the invitation], but that doesn't matter! It was the way they worked that matters. All 3 of them, on Joanne's eye gaze, ALL taking turns and making choices for each of the areas of the invite. It was a 'crying' moment! [...] the important thing is how they worked together.

Evidence from the pilot study suggested that being part of a group was a facilitating factor for the children to form ideas and share opinions. However, the difference in the social

interactions between the child participants in the pilot compared to the main study was striking. In the main study I frequently reflected on the impact that peers had (or seemingly did not have) on the interactions of the child who used hi-tech AAC. The children had limited social interaction, despite being from the same class and spending a lot of time together in their everyday school activities. Further, Cai expressed his indifference to the presence of his peers in his interview (4.5.2.).

There were two fleeting moments across the sessions where a peer (Shaun) directly interacted with the hi-tech AAC user (Cai) without being prompted. For example:

“I normally go to sleep,” he [Shaun] said smiling. Shaun rocked forward in his chair and pulled Cai away from the laptop screen and down on his lap for a cuddle.

“And you have usually got a buddy, haven’t you?” said Kate.

Shaun continued to smile and rock gently on his chair with Cai on his lap. Cai’s expression didn’t change but neither did he attempt to free himself from this impromptu cuddle.

(video-ethnography excerpt)

However, these moments were remarkable due to their rarity. Unlike the pilot study, the children did not collage together at the same table at the same time, they gave their opinions in group activities but rarely, if ever, looked at or listened to their peers’ opinions. Facilitating peer interactions was not a direct goal of the study but I had hoped that AAction Heroes may positively contribute to co-creation processes and facilitate the children to form their ideas together (Ajodhia-Andrews, 2016). However, this was not observable in the main study data. I have reflected on various reasons for this difference. It may be due to gender differences: coincidentally all the pilot study participants were girls whilst the main study were boys. Gender may have influenced peer interactions, for example, DiPrete and Jennings (2012) suggest that in the early years of education (ages 5- 11) typically developing girls have stronger social and behavioural skills than boys. Differences in peer interactions may also be related to the children’s CCN: two of the children in the main study had a diagnosis of ASD which is characterised by social communication and interaction difficulties (ICD-11, 2021). Arguably, the child without an ASD diagnosis (Shaun) was responsible for initiating and maintaining the two observable social interactions in the study, through physically pulling Cai on to his lap, and laughing and chasing Cai when he exited the headteacher’s office saying “*Can I have Tiddler? Can I have Tiddler?*” (4.3.5). Although these

episodes did not contribute to the understanding of Cai's perspective *per se*, it showed me that both children had playfully mischievous personalities. It may be, that despite the limited observable peer interactions, participating in AACtion Heroes gave them a much needed "licence to be daft" (Kate, session 5) (4.4.3) However, the idea that peer interactions would contribute directly to the process of storybook co-creation was not supported.

6.4. Co-construction of messages mediated through hi-tech AAC in a special school setting

Research question 3 relates to the examination of co-construction in interactions mediated through hi-tech AAC in terms of the observable talk, visible actions, and material artefacts utilised by the participants. This section of the discussion relates to the findings of the visual interaction analysis (5.3) which revealed how the *adult* participants in the main study co-constructed their interactions with child participant, Cai, through their visible actions, talk and material artefacts in the environment. Although this study set out to explore group interactions involving a child who uses hi-tech AAC and their peers with CCN, there were no instances of peer interaction which directly contributed to the co-creation of Cai's storybook. Therefore, the findings of this study only address interactions between a child who uses hi-tech AAC and adults in the special school setting. In each instance, the VOCA is available for interlocutors to use in their interaction. However, the interlocutors orientate to the multi-modal material artefacts that were relevant to them at the time, for example, storybooks, photographs, etc. Therefore, the interactions are not always mediated through the VOCA.

Taken together, the video fragments add to our understanding of interactions mediated through hi-tech AAC in the special school setting. As interactions were video-recorded as part of a child-led quasi naturalistic experiment, this study builds on previous work (Solomon-Rice and Soto, 2011) by examining what child-led co-construction might look like (2.4.7.). When considered as a collection it is possible to compare the video fragments to identify patterns, as well as identify any examples which appeared to contradict the larger emerging pattern or phenomena (Heath et al., 2010). For example, this study's findings contribute to what is known about multi-party interactions (Tegler et al., 2020) and

child-led co-construction processes (Solomon-Rice and Soto, 2011). Examples from this study will be discussed in relation to existing AAC interaction literature under the following sub-headings: Co-construction processes in multi-party interactions; Co-construction processes involved in aided language modelling; Interactions mediated through material artefacts (including and in the absence of the VOCA).

6.4.1. Co-construction processes in multi-party interactions

Most of the existing research into interactions mediated through hi-tech AAC in a special education setting is based on dyadic interactions, that is, the child who uses hi-tech AAC and one other naturally-speaking communication partner such as a peer (Clarke and Wilkinson, 2007; 2008; 2009; Savolainen et al., 2020), SLT (Solomon-Rice and Soto, 2011), or teacher (Norén et al., 2013; Clarke et al., 2017; Savolainen et al., 2020). Studies involving children who use hi-tech AAC in mainstream classroom settings where multi-party interactions are likely have also looked at dyadic interactions and quantified their findings, for example, the proportion of adult-child interactions compared to child-child interactions (e.g., Andzik et al., 2016; Chung et al., 2012). This means that much of what we know about the characteristics of interactions mediated through hi-tech AAC in the school setting, such as the asymmetry of conversational turns and restricted range of communicative functions expressed by AAC users is based on observations of two interlocutors. Though some evidence involving multi-party interactions is emerging (Sotiropoulou-Drosopoulou et al, 2021; Tegler et al., 2020) it remains significantly limited. Yet, children who use hi-tech AAC are frequently involved in interactions involving more than one other person, whether it be at home with family or at school in the classroom environment. This study provided a group context, thus analysis of multi-party interactions involving a child who used hi-tech AAC was expected. Indeed, video fragments A, D, and E all involve Cai interacting in a context where more than one other participant is present. However, visual interaction analysis of these fragments revealed that side-sequences, whereby an adult and child interact in a dyad before re-joining the group interaction, may be a feature. The qualitative findings from this study adds to the nascent quantitative knowledge emerging in this area (Sotiropoulou-Drosopoulou et al, 2021) and reinforces Tegler *et al's* (2020) findings that side-sequences of

dyadic interaction may be observable when a child is using hi-tech AAC in the special education classroom.

Sotiropoulou-Drosopoulou *et al's* (2021) quantitative study explored a large multi-national and multi-lingual data set of videoed interactions (n=85) to compare the discourse patterns of dyadic and multi-party interactions involving a child who uses hi-tech AAC and their familiar speaking partners, that is, a peer, a parent, or teacher/teaching assistant (Sotiropoulou-Drosopoulou *et al*, 2021). For dyadic interactions, the authors found evidence for the asymmetry reported in previous studies (Andzik *et al.*, 2016; Chung *et al.*, 2012), with speaking conversation partners taking more turns at talk and exerting more conversational control through use of questions which obliged the AAC user to respond (Sotiropoulou-Drosopoulou *et al*, 2021). However, in multi-party interactions, the child using AAC produced more initiations and comments and fewer responses, suggesting they were able to participate more actively in multi-party conversations (Sotiropoulou-Drosopoulou *et al*, 2021). This is perhaps an unusual finding as one might assume more speaking conversation partners would further the dominance of spoken conversation over aided utterances. The authors hypothesise that in multi-party interactions the child may feel less pressured to participate quickly as they are able to construct their utterance alongside the ongoing conversation and contribute when they are ready (Sotiropoulou-Drosopoulou *et al*, 2021).

The qualitative analysis of video fragment A (4.3.1) finds evidence to support these same findings. Cai and Linda co-constructed an aided utterance in a side-sequence of interaction parallel to a group discussion: the children are being asked where in school is important to them. Cai will be able to say, "*I like library*" and take his turn in a timely manner as part of the group discussion. In this event, Cai is being taught to construct a relevant aided utterance alongside the multi-party (group) discussion. What is not clear is whether Linda is actively teaching him this skill; it may be that she is taking the opportunity to model functional language for the context without explicitly considering the nature of multi-party interactions. Given the nature of classroom activities such as Circle Time (Mosley, 1998) and other group learning contexts, it may be that children who use hi-tech AAC in the school environment are indirectly being taught to co-construct AAC utterances in a dyadic exchange (e.g., with an LSA) which are embedded in multi-party contexts (e.g., group discussion led by the teacher). Certainly, in video fragment A, Cai seems familiar with

this model of teaching hi-tech AAC. Unlike the dyadic attempt at aided modelling in video fragment Ci, Cai appears relaxed and happy to engage in co-constructing a sentence which has relevance to the wider group interaction. Similarly, Tegler *et al* (2020) found that children who use eye-gaze to access their hi-tech AAC devices in two special education classrooms were supported by a LSA to construct relevant AAC utterances in response to class teacher's questions, thereby taking their turn in the whole class discussion (Tegler *et al.*, 2020). It may be that multi-party interactions such as classroom discussions provide a more relaxed environment than dyadic settings, as aided communicators have more time to prepare their utterance (Sotiropoulou-Drosopoulou *et al*, 2021). Further to this, multi-party interactions could provide a relaxed context for the practice of aided language modelling as there is extra time to co-construct an utterance which is relevant to the ongoing conversation.

Multi-party interactions may offer aided communicators more time to contribute to the ongoing interaction. However, they are not intrinsically facilitative of more symmetrical discourse patterns. The turn taking imbalance found in dyadic conversations increases further in multi-party conversations, with naturally speaking communication partners taking even more turns in an interaction (mean turns $x=22.8$) than aided communicators (mean turns $x=12.15$) (Sotiropoulou-Drosopoulou *et al*, 2021). That is, although children who used hi-tech AAC were found to communicate for different reasons (initiations and comments, rather than responses) in multi-party interactions, they still took far less turns-at-talk than their naturally speaking communication partners (Sotiropoulou-Drosopoulou *et al*, 2021). Similarly, the data in this study suggests that the presence of more than one adult communication partner can serve to constrain the child's turns at talk. For example, Cai speaks to the headteacher to request a new book for the library; "*can I have Tiddler?*" (4.3.5). This is an encouraging encounter as children who use AAC rarely initiate conversations or ask questions (Andzik *et al.*, 2016). However, the opportunity for Cai to clarify his message or respond to a further question from the headteacher, "a book?", is lost because the other adults anticipate and respond for him. It is likely, though not definite, that Cai could have taken more turns at talk to clarify this message as he was able to respond to adult questions in other contexts (see video fragments A and E). In this case, the multi-party context does not appear relaxed; indeed the actions of the supporting adults

suggest they are anxious about how the interaction will unfold and the focus on Cai's communicative success resulted in more control over the interaction than was necessary.

In a more familiar classroom environment where the adults' focus is not just on one child, a more relaxed communication situation may emerge. In their analysis (Conversation Analysis) of teenagers using eye-gaze in a special education classroom, Tegler and colleagues (2020) found that the teachers and LSAs used scaffolding and repair strategies with *all* of the children in the classroom to both encourage the child who used AAC to continue to construct their utterance and encourage the other children to maintain silence and leave a space for the AAC user to contribute (Tegler et al., 2020). The need to facilitate the whole group of children to leave space for an aided utterance was also raised in this research across the pilot and main study. Further research into the characteristics of typical multi-party AAC interactions at school appears warranted.

Multi-party interactions are a promising area for future study and may counter the imbalance that is typically seen in interactions involving aided communicators and their speaking communication partners. Nevertheless, the context or goal of the multi-party interaction should be carefully considered. Less pressure for constructing a hi-tech AAC utterance may be achieved if there is an ongoing conversation which is not necessarily related to an individual child's communicative success. Encouragingly, this may be achievable in typical special education classroom settings when episodes of co-construction could be embedded in everyday small group activities or class discussions. The presence of the child's peers (who may also have CCN) and who are also discussing the topic may take the focus away from the individual child's slow pace of AAC utterance construction as well as providing a genuine and relevant context. However, due to time needed to construct an AAC utterance the child will miss the ongoing conversation and their utterance will be at risk of being no longer relevant. Thus, the impetus may stay with the adult (e.g., teacher or LSA) to support the other children in the group to leave space for the upcoming aided utterance and/or provide a further question or comment which makes the utterance-under-construction relevant to the whole-group interaction.

6.3.3. Aided language modelling in a special school setting

Aided language modelling is the use of spoken language in tandem with aided language outputs in naturalistic contexts (Sennott et al., 2016). Several reviews of the AAC intervention literature have shown that aided language modelling has a strong evidence-base in terms of developing the linguistic competence of children who are learning to use AAC (Gevarter et al., 2013; Sennott et al., 2016; Allen et al., 2017; Biggs et al., 2018; Lynch et al., 2018). Therefore, aided language modelling appears a promising teaching strategy for clinicians and educational professionals to utilise with children who are learning to become aided communicators (Lynch et al., 2018). However, there is variation in how intervention studies report their methods and procedures (Allen et al., 2017) making it difficult for professionals to extrapolate how aided language modelling could be used most effectively in the school setting (Lynch et al., 2018). Furthermore, there is a paucity of information on the co-construction processes involved in aided language modelling and how the business of ‘teaching AAC’ unfolds in everyday practice. The interactional instances analysed in this study do not claim to demonstrate a best practice intervention procedure. Nevertheless, they offer insight into how an experienced specialist AAC teacher and child hi-tech AAC user orientate to episodes of aided language modelling and provide examples of when this is and is not a success. Therefore, these examples offer some insight for designing and delivering aided language modelling as a teaching strategy in everyday interactions at school.

Video fragment A (4.3.1) was drawn from a dyadic interaction between Cai and the AAC teacher, Linda. In this fragment, we see Linda and Cai in shared orientation to the AAC device screen as they successfully co-construct the sentence *“I like library”*. Notably, Cai also approximates *“lie”* [library] using speech, in tandem with his aided utterance *“library”*, just as Linda models both spoken and aided utterances, suggesting aided language modelling supports naturally spoken and AAC utterances (Bellon-Harn and Harn, 2008). Importantly, Linda has not pre-planned what message to co-construct but has been led by Cai’s previous multi-modal communication and has inferred *“I like library”* as the ‘tidied up’ sentence that reflects what Cai wants to say. Both Linda and Cai are orientated to the device screen as they navigate through folders of vocabulary together. Shared orientation to folder navigation has been highlighted as a characteristic of teacher/pupil interactions mediated through AAC in the school setting (Norén et al., 2013; Tegler et al., 2020). It renders the

child's thoughts and actions visible in terms of what they are trying to say (Norén et al., 2013): the adult is able to infer what the child may be trying to say, as they are looking for it. This could help progress the conversation and allow the adult to scaffold the child in finding vocabulary on the VOCA (Tegler et al., 2020) or, conversely, leave the child's utterance open to adult influence if the adult chooses to change the topic mid-construction (Norén et al., 2013). In this study's data, we can see that shared orientation to the screen can also be used as a teaching resource for aided language modelling. Both Cai and Linda know that the target sentence is "*I like library*" but it is the teacher's intentions to demonstrate the location of the child's target vocabulary "*library*" that is visible to both interlocutors.

Linda is teaching both operational and linguistic (Light and McNaughton, 2015) skills as she facilitates Cai to locate vocabulary and co-construct an aided-utterance with his VOCA. Linda is not only modelling aided language alongside her speech, but uses other scaffolding techniques such as questions, pauses, and verbal and gestural prompts. The concept of adult "scaffolding" is derived from the work of psychologist Jerome Bruner (b.1915 – d.2016) and is a well-established teaching strategy. As well as supporting the language development of typically developing children (Bruner and Watson, 1985; Clarke et al., 2017) scaffolding strategies have also been shown to support the spoken and aided utterances of children who use AAC (Bellon-Harn and Harn, 2008; Clarke et al., 2017; Soto and Clarke, 2017; 2018). Linda also uses steady and slow-paced speech in tandem with symbol activation which adds weight to theories that aided language modelling is successful as it indirectly results in the communication partner using other facilitative communication behaviours (Smith, 2015; Lynch et al., 2018).

Aided language modelling is more than speaking a sentence alongside symbol-selection. Linda demonstrates knowledge of the AAC device and its vocabulary locations, sensitive modelling and scaffolding teaching strategies, with a slowed pace of communication and the shared goal of building a sentence which is known to be relevant to the child. That is, Linda is using a 'tidied up' (5.2.2) sentence to convey a message that she believes Cai wants to say based on his previous interactions with her and the rest of the group. In this way she is using her experience of interacting with Cai in macro time (many interactions over an hour to explore what Cai thinks) to teach him how to express his ideas in micro time (over seconds) (see section 5.3.3. for further discussion of macro and micro

time). The visual interaction analysis used in this study reveals the processes involved in aided language modelling and how this is a success when the adult attempts to be child-led, that is, spends time exploring the child's ideas through multi-modal means, then utilises their teaching skills to enable the child to say what they think in an AAC utterance.

Although Linda is a highly skilled AAC teacher, who as we see in fragment A, can participate in sensitive AAC co-construction processes, her approach is not always successful in engaging Cai. Fragment Ci (4.3.3) was taken from a longer interaction in which Cai is completing a collaging activity. Linda attempts to initiate an episode of aided language modelling yet Cai rejects the use of his AAC device. In this instance, insisting on the use of hi-tech AAC complicates the progression of the interaction which appears to frustrate Cai. Linda and Cai no longer have a shared communicative goal; Cai wants to respond to the content of the question, whilst Linda wants to develop the linguistic form used in his response through hi-tech AAC. This divergence in communicative goal is similar to findings from Sundqvist and colleagues (2010), who studied the interactions of 3 school-aged children who used AAC in their mainstream school setting. They found that interactions were unsuccessful and strained if the child and teacher had different expectations of what the authors described as the 'communicative project' (Sundqvist et al., 2010). As in the above example from the present study, their child participant focused on the content of the message whilst the teacher focused on the form of the message (Sundqvist et al., 2010). Sundqvist et al (2010) also argued that adult teaching agendas in the school setting can push children towards an adult-like sentence level utterance at times when "it might be socially valid to express oneself in a different way for a child than for an adult" (Sundqvist et al., 2010, p. 173). As was the case in this interaction between Cai and Linda, Cai's use of pointing was both a successful and socially acceptable mode of communication. It is perfectly acceptable for anyone to use non-verbal modes such as pointing and gesture in some contexts. In this context, spoken utterances are not the only communicative resources that children with or *without* communication impairments could employ.

Taken alone as evidence of Cai's preferred communication mode, analysis of fragment Ci could suggest that Cai is not interested in using a hi-tech AAC device; whilst he is being supported by an experienced and skilled AAC teacher who is familiar to him he still rejects the AAC mode. However, when taken together with fragment A, it suggests instead

that Cai's rejection of the AAC mode is related to the context of the interaction rather than an inability to or lack of motivation to communicate via a hi-tech AAC modality. The success (or not) of an interaction with a dual purpose (i) intended to teach the use of AAC, and (ii) enable successful communication for the child, has multi-faceted issues. These issues are not necessarily related to the skills and abilities of the interlocutors. Even an experienced AAC teacher will struggle to engage the child in co-construction processes if they do not share the same communicative goal.

Aided language modelling involves using sensitive scaffolding practices within an interaction. As such, teachers may be well-suited to the aided language modelling of AAC utterances. AAC specific elements such as knowing vocabulary locations on the AAC system and slowing the pace of communication are important but in this study's data, such knowledge is underpinned by scaffolding teaching practices. This analysis has shown that joint orientation to the AAC system could be used effectively as the adult's and child's intentions are visible to each other. However, adults should not use this orientation to change or redirect the child's utterance (Norén et al., 2013) but embark on a shared communicative project with the child (Sundqvist et al., 2010). That is, do not pre-determine the target sentence and shape the child's AAC utterance towards an adult-like form which complicates the progression of the interaction, but be child-led, pay attention to the child's multi-modal contributions, and acknowledge the content and social purposes of their initiations (Sundqvist et al., 2010; Solomon-Rice and Soto, 2011). The adult could then support the child in co-constructing an AAC utterance which is reflective of the child's communicative intent.

6.3.4. Interactions mediated through material artefacts (including and in the absence of the VOCA)

A small number of studies of interactions mediated through hi-tech AAC in the special education setting have observed the use of other material artefacts in addition to the VOCA in their analysis, including worksheets (Tegler et al., 2020), photographs (Solomon-Rice and Soto, 2011; Clarke et al., 2017), or a story grammar map and paper/easel (Solomon-Rice and Soto, 2011). In an education setting, additional material artefacts may be central to certain curricular-tasks and may be a feature of interactions mediated through hi-tech AAC in a

special education setting. In this study, material artefacts (in addition to the VOCA) were purposefully provided as a means of facilitating children who use hi-tech AAC to express their views. For example, in video fragments Ci and Cii (4.3.3) Cai is involved in a collaging activity using photographs he has taken to explore his likes and dislikes regarding school. Comparing and contrasting the fragments offers insight into how material artefacts are utilised in a similar interaction with and without the VOCA.

In fragment Ci AAC teacher Linda approaches her interaction with Cai with the goal of prompting him to use his VOCA to answer the question *which one do you like?* However, Cai's attention is taken up with reviewing his photos and considering which one he was going to stick down. Collaging has been used successfully with adolescents who use hi-tech AAC as a means of facilitating them to talk about their lives (Wickenden, 2011) whilst developing the grammar of their AAC utterances (Soto and Clarke, 2018). However, as described above, Cai appeared frustrated by the teacher's insistence on using the hi-tech AAC mode to facilitate the interaction and he pushed the AAC device away. Conversely, in fragment Cii, Laura and Cai do not use the VOCA to mediate their interaction during the collaging activity. Cai moves Laura's finger on to a photograph and Laura interprets Cai's visible actions as an indication of his choice, *hhthis one is it? <shall we put some> glue on↑it↑*, and Cai responds affirmatively by picking up the glue stick. As in previous studies, the child's visible actions are quickly interpreted and spoken aloud by the communication partner meaning the child who uses hi-tech AAC need only affirm or reject the communication partner's interpretation (Clarke and Wilkinson, 2009; Solomon-Rice and Soto, 2011; Savolainen et al., 2020). Visible actions may offer speed and efficiency over VOCA mediated turns. However, fragments Ci and Cii suggest that the use of material artefacts (other than the VOCA) may also be quicker and more efficient in some contexts. That is, it was quicker and more efficient for Cai to point to his chosen photograph than express his choice through a separate material artefact, the VOCA. Communicating through an AAC system is known to be a highly cognitively demanding task (Mooney et al., 2019) requiring the child's sustained attention, memory, and executive function (Light and Drager, 2002; Murray and Goldbart, 2011; Robillard et al., 2013; 2018; Thistle and Wilkinson, 2012; 2013) (see section 2.2.6. of the literature review). It may be that Cai's cognitive resources were taken up with reviewing his photographs and collaging and he could not/need not

switch his attention and express himself through a different material artefact (VOCA) at that time. The additional cognitive demands of expressing oneself through the VOCA may be lessened by additional visual artefacts such as photographs. However, if adults insist on both modes, demands actually increase. This has implications for the AAction Heroes approach but is also relevant to wider curriculum based tasks which may utilise additional material artefacts.

The key purpose of AAC is to facilitate meaningful participation in everyday activities that most of us take for granted (Light and McNaughton, 2015). Therefore, participation in educational activities should be enhanced using AAC. That is, using AAC is not a desirable activity in and of itself – it is the conduit through which everyday activities and interactions can be mediated. Adults who have a role which involves supporting children to use hi-tech AAC should be aware of the cognitive demands of the task at hand, especially if they involve switching attention to another material artefact, so that they may consider if and how AAC could enhance the child's participation in the activity. Implications for typical AAC practices at school will be summarised in the following chapter.

6.4. The viability of AAction Heroes: co-creating children's personal storybooks with children who use hi-tech AAC and their peers with CCN in the special education setting

Research question 4 relates to the viability of the AAction Heroes approach from the perspective of the adult participants and the child who uses hi-tech AAC. This section of the discussion is based on the thematic analysis of the participant interviews (5.5) and existing AAC literature. It will begin by summarising the AAction Heroes approach and its central tenets to provide a context for the viability discussion that follows (6.4.1). Child participant Cai's views on AAction Heroes will be examined first (6.4.2), before moving on to adult participant perceptions of viability (6.4.3). The viability and potential of AAction Heroes will be presented under the following headings: Summary of the AAction Heroes approach, Hearing the views of a child who uses hi-tech AAC on the AAction Heroes approach, and Reimagining AAction Heroes as communication partner training/reflective practice.

6.4.1. Summary of the AAction Heroes approach

AAction Heroes is a child-led, group approach to hearing the views of children who use hi-tech AAC and their peers with CCN. It respects both the rights of children with CCN to have their views on school both heard and taken seriously and the knowledge and skills of adults who support them in the special education setting. It is built on socially-constructivist theory which assumes that knowledge is created through interactions with others. AAction Heroes involves 6 weekly sessions in which a small group of children and adults from the same classroom 'look-think-act' together. That is, LOOK at their school setting, THINK about their views on school, and ACT on their ideas. Adults engage in facilitated reflective practice after sessions 1- 5 with the children and collaboratively decide on how they can be child-led in the following session, and how this might apply more broadly in their school setting. This might include, for example, practical adaptations to activities to meet the needs of individual children, reflection on their own communication in AAC interactions, or ideas for being child-led in the classroom and wider school setting. In this way, AAction Heroes offers children the opportunity to have their views heard and acted on, and adults the opportunity to reflect on and implement child-led principles and practices in their special school setting. There are detailed session plans and suggested activities for how this may be achieved in the special school setting. However, broadly speaking there are five central tenets of the AAction Heroes approach:

1. **Group exploration of ideas** with children and adults who would typically interact together
2. **Multi-modal resources and activities** which recognise the strengths and abilities of children who use hi-tech AAC and their peers with CCN, e.g., photography.
3. **Repeated opportunities to participate** in every activity so that children have time to explore their views rather than complete the task.
4. **Optional participation** so that children have agency, choose to take part in the activities (or not) and adults follow their lead.
5. **Collaborative, facilitated reflective practice** with adult educators which recognises the knowledge and skills of adults who know the children well.

Recommendations for implementing the AACtion Heroes approach in the future will be addressed in the following chapter (7.1).

6.4.2. The views of a child who uses hi-tech AAC on the AACtion Heroes approach

AACtion Heroes created a small group context with peers and adults, rather than whole-class group or one-to-one adult/child context. However, Cai did not appear to value the group element of the AACtion Heroes approach; he did not express a strong dislike for his peers but did not strongly favour their presence. Cai appeared to value building a stronger one-to-one bond with adult participant (LSA), Kate. Clarke and colleagues (2001) interviewed 23 children and young adults about using AAC systems and the children reported preferring one-to-one direct therapy outside of the classroom context; “[In a one-to-one I can] talk more’, ‘[I can] say what I feel.” (Clarke et al., 2001, p. 112). It may be that like other children who use hi-tech AAC, Cai feels he is able to express himself more freely in one-to-one conversations with an adult. Children who use AAC are known to interact prominently with adults, and parents have reported involving their child in adult interactions due to concerns that other children would leave their child out of activities and conversations (Batorowicz et al., 2014). Alternatively, it may be that the lack of value Cai places on social interaction with his peers is associated with his diagnosis of ASD (ICD-11, 2021).

The group format gave Cai the opportunity to work more closely with a different adult Kate, rather than maintaining the fixed 1:1 relationship typical of the classroom. Children have no control over who will be assigned as their LSA and evidence suggests that having one-to-one support limits the child’s opportunities to interact with any other adults in the class (Tews and Lupart, 2008). Pinkard (2021) interviewed 10- and 11-year-olds (n=10) with special educational needs attending mainstream classrooms about their 1:1 LSAs. The children reported that they were always with their LSA and had limited interaction with their class teacher. Although most described their LSAs as kind and helpful, some reported that their LSAs could be irritable, and interactions were not always positive (Pinkard, 2021). This is perhaps understandable and indicative of the “strains quite naturally placed on a relationship when two people spend such a lot of time together” (Pinkard, 2021, p. 260). Considering these views, it is perhaps beneficial for children like Cai to experience

interactions with a range of adults in the classroom. Indeed, the adult participants in this main study also reported interacting with *all* (rather than just one) of the children was enjoyable, suggesting both adults and children may value more varied opportunities for interaction.

Cai valued the use of photography within the AACtion Heroes approach. Photos allowed him to explore and express his opinion and taking a photograph appeared to be a familiar and accessible activity for him. Using images to express one's opinion is now a commonplace activity and arguably familiar to everyone in modern society due to the availability of camera technology in mobile phones, and online photo-based platforms such as Instagram. Whilst interactions mediated through AAC are only familiar to aided communicators and their communication partners, uploading a photograph with an accompanying symbol for like or dislike is becoming a universally familiar experience. As multi-modal communicators, children who use AAC are well equipped for this modern means of expression: AAC systems can take photographs and communicate symbolically to position what the image means to the user.

Young people who use AAC report a desire to use social media which offers a platform for constructing their identity in a way that is determined by them (Hynan et al., 2015; Caron and Light, 2017). Poor orthographic skills present a barrier to online interactions (Hynan et al., 2014; Hynan et al., 2015) but image-based platforms such as Instagram could alleviate some of these difficulties and offer a bridge for children who use AAC to communicate beyond their inner circle of familiar people to wider (online) society. Nevertheless, children and young people who use AAC may need support to access the medium (photography) and social media platforms. This study has shown that children who use AAC systems enjoy using photography and are able to engage in symbol supported discussions about their likes and dislikes. Given the research highlighting adolescent AAC user's desire to use social media platforms (Hynan et al., 2015; Caron and Light, 2017), children could be supported to present their views through photographs, symbols, and text at school. This would prepare them for contemporary online social interactions in adolescence and adulthood.

Cai, like other children who use AAC, reported liking his hi-tech AAC device (Clarke et al, 2001; Midtlin et al., 2015) and the adult participants reported that Cai was able to use it

more in AACtion Heroes than he would in typical classroom interactions (5.5.2.). Although not directly intended to increase the child participants' use of AAC, it is perhaps understandable that participating in a project named 'AACtion Heroes' increased the group's focus on facilitating Cai (and the other child participants) to communicate via the AAC mode. It is encouraging to see that Cai appeared to value using his AAC device in the AACtion Heroes context.

6.4.3. Reimagining AACtion Heroes as communication partner training/reflective practice

Providing instruction to the communication partners of children who use AAC is understood as an essential type of AAC intervention (Binger and Light, 2007; Kent-Walsh et al., 2015). SLTs may train children's communication partners in different ways. For example: give advice on how to adapt their communication; provide a model whilst the partner is watching the SLT interact with the child; ask the communication partner to describe what they are going to do in their next AAC mediated interaction (verbal rehearsal); role play using an interaction strategy with the SLT in the absence of the child; give guided instruction as the child and the communication partner interact in a specific activity (Kent-Walsh et al., 2015). Despite its widely acknowledged importance, SLTs report having limited time to provide a full range of AAC interventions and communication partner training can be overlooked in favour of direct interventions with the child who is learning to use the AAC system (Tegler et al., 2019a). This may be particularly true for SLTs working in a school-setting where high staff turnover can mean that teaching staff who have been trained do not interact with the child long-term (Johnson et al., 2006; McNaughton et al., 2008; Tegler et al., 2019a).

The AACtion Heroes approach was not designed as an explicit form of communication partner training. Nevertheless, providing adults with the opportunity to reflect on their own practice with regard to supporting the children to express their ideas meant they could reach their own conclusions about what was helpful - or not helpful. Elements of verbal rehearsal, that is, describing what they were going to do in the next AAC mediated interaction, was an implicit part of reflecting using the crib-sheet and identifying what we (myself and the adult participants) would try next time. Unlike communication partner training, the interaction strategies were not pre-defined but arrived at through

reflection and dialogue. It may be that structured reflection with the crib-sheet was an effective means of enhancing the adults' positive AAC interaction behaviours. Certainly, it was a means of acknowledging and respecting the knowledge of LSAs and the teacher who participated, rather than giving 'expert' SLT advice around positive AAC interaction behaviours (Gallagher et al., 2018). Using observation sheets alongside video of parent-child interactions is a common speech and language therapy intervention to enhance parents' positive communication behaviours for children with language delays and those with CCN (e.g., Baxendale and Hesketh, 2003; Pennington and Thomson, 2007). Furthermore, guided reflection using observation forms has been shown to be more effective than other instructional strategies such as explaining, modelling, and practising the target skill (Fukkink et al., 2011). However, this is in relation to reflection on videoed interactions specifically and may not apply to reflective discussion alone.

This study did not set out to gather evidence of change in adult interaction strategies in their ongoing AAC interactions. Therefore, explicit claims that the AAction Heroes approach is a form of communication partner training cannot be made. Nevertheless, adult participants frequently commented on their intention to use strategies such as asking children their opinion, giving more time, and trying child-led approaches to certain activities in the future (5.5.3). The thematic network: Imagining the future suggested that participating in AAction Heroes made the adult participants think about how they could be more child-led in the classroom and make wider changes to the school council (5.5.3). The idea that AAction Heroes could be a form of collaborative communication partner training has emerged from this investigation. Tentatively, AAction Heroes may provide SLTs with a programme that directly supports children to express their ideas in tandem with training communication partners, albeit through reflective practice rather than explicit instruction. This dual focus could be beneficial in terms of navigating workload pressures and time constraints. Further, it may provide holistic support for everyone involved in interactions mediated through AAC, rather than focussing on the child's communication skills in isolation. The collaborative and reflective nature of the discussions means that the content of the AAC 'training' would not pre-determined. However, I will describe some of the potential applications for hi-tech AAC below based on this study's findings, under the

following subheadings: moving beyond requesting, micro and macro time, and AAC and behaviour.

Moving beyond requesting

The thematic analysis suggested that adult participants valued the experience of asking children what they think rather than what they want or need (5.5.1). At school, teachers may talk about the curriculum topic (Tegler et al., 2020) and steer informal conversations about like and dislikes back to the curricular task-at-hand (Norén et al., 2013). Furthermore, some authors argue that the VOCA itself promotes transactional interactions, as vocabulary is organized to express “*I want X*” rather than diverse social functions such as sharing anecdotes or personal narratives (Tintarev et al., 2016; Waller, 2019). It is encouraging that adult participants in this study valued discussing views and ideas with the children as expanding the reasons for children to communicate beyond requesting has been reported as a priority across the AAC literature by parents (Light et al., 2002; Bailey et al., 2006) and researchers (Gilroy et al., 2017; Waller, 2019). The emphasis in the AACtion Heroes approach was on utilising multi-modal means of communicating with the goal of co-creating children’s personal storybooks: the AAC device was only one tool in this process. It may be that the AACtion Heroes approach alleviated some of the barriers to diversifying communicative functions which are related to the school setting and AAC device limitations, by creating a context where the specific purpose was to exchange ideas through multi-modal interactions.

Adults in this study welcomed the opportunity to diversify their conversations beyond the transactional. However, this required the adults to take a different approach to their typical ways of interacting with (and teaching) children who use AAC, and they required facilitation and time to reflect on how they could do this. All adult participants in this study reported a lack of training in (hi-tech) AAC and typically little or no time to reflect on their practice. Lack of communication partner training in AAC is frequently reported as a problem (Light and Drager, 2007; Baxter et al., 2012b; Tegler et al., 2019b) even in special education settings where many of the students use AAC (Norburn et al., 2016). In this study, Kate reported that the majority of LSAs had some level of training in PECS, the primarily low-tech, symbol-based communication system (Bondy and Frost, 1998) but no other training in

AAC. PECS is based on behaviourist theory (e.g., Skinner, 1957) and is a commonly implemented system for children with a diagnosis of ASD as it was originally designed for this group of children. However, PECS is now used both in the UK and across the globe by children of all ages who have various cognitive, physical and communication needs (Bondy and Frost, 2001). It requires specific training of communication partners such as LSAs if it is to be successful (McCoy and McNaughton, 2019) and is a widely used and familiar system for professionals working in special education. PECS then is both ubiquitous and prescriptive which may explain why Kate and the other LSAs in this education setting would have accessed this training over and above other training in AAC systems. PECS is only used for requesting. Although it is theoretically possible to teach children to comment in the later phases of PECS, in reality, children rarely reach this point.²² In summary, in the special education setting PECS is primarily used to teach children the transactional nature of communication so they can make basic requests for preferred items (e.g., snacks and toys) and the majority of teaching staff appear to receive no other training in AAC systems.

The focus on requesting in the special education setting may be inadvertently stagnating AAC interactions. Education professionals have little experience or training of how to expand and diversify the child's communicative functions into other areas. Behaviourist methods like PECS are not easily applied to complex communicative functions such as sharing opinions and ideas, anecdotes, and personal narratives. For example, a behaviourist approach to teaching a child to express an opinion, "I like the library" may break the sentence down into steps, explicitly telling and showing the child what to do, offering them a chance to practice, and giving feedback on their performance. The accomplishment of the goal could be measured through observation of their behaviour if they successfully construct the sentence independently. However, with such an approach it is not known if the child actually likes the library: there has been no exploration of their ideas. Whilst the child has expressed a grammatically correct 'opinion', behaviourism does not address the issue of whether it is the child's actual opinion as thoughts and mental

²² McCoy and McNaughton's (2019) systematic review included seven studies for training education professionals to implement PECS and involved approximately 40 communicators; none of the children mastered commenting at phases five and six.

processes are not observable and thereby not accounted for in behaviourist methods (Woollard, 2010).

As this research has shown, children who use AAC *are* able to convey their perspectives and talk about their ideas, but other elements of the school context and staff knowledge need to be adjusted to facilitate this. If school-aged children who use AAC are to diversify their use of communicative functions beyond that of basic needs and wants, the people who support and interact with them require training and opportunities to problem-solve how they can achieve that in their school-setting. To move beyond requesting, they may need to move beyond behaviourist approaches. The AACtion Heroes approach may create a (socially-constructivist) context in which children are afforded the opportunity to talk about their views whilst teaching staff can reflect on how best to support the children to this end. In this way, the solutions for enabling the children's participation in the approach will be local rather than prescriptive.

Adult participants in this study reported they would continue to ask children who use AAC what they think and utilise the multi-modal activities beyond the remit of AACtion Heroes. It may be that a reflective, collaborative problem-solving approach can diversify children's reasons for communicating beyond that of requesting. However, it is not known if the adults went on to apply these strategies or if the children who participated went on to engage in further interactions for purposes other than conveying wants and needs and answering curriculum topics, or what might encourage them to do this longer term. Nevertheless, that the adult participants reported changing the way they interact with children who use AAC is a potentially important legacy of this study.

Micro time and macro time

The concept of time recurred across the thematic networks and appeared to address both the microdetail of needing extra time (over seconds) in AAC interactions and the macro consideration of needing extra time (over weeks) to fully explore the children's ideas. Giving children who use hi-tech AAC more time both in their interactions and through repeated opportunities to explore their ideas could be an important facet of training for education staff. Various authors have emphasised that interactions involving AAC are slow-paced and

children who use AAC require extra time to respond in their interactions (Smith and Grove, 2003; von Tetzchner and Martinsen, 1996; 2000; Beukelman and Mirenda, 2013). Research consistently shows that children who use hi-tech AAC can take over 40 times longer than naturally speaking children of the same age to name and describe pictures or events (e.g., Murray et al., 2018; Smith et al., 2018). Adults have been observed to leave little time for children who use AAC to respond, interrupting their utterances as they are under construction (Light et al., 1985). Yet when adults increase the length of pause in interactions with children and young people who use AAC, they are more likely to respond (Mathis et al., 2011). Subsequently, researchers advocate communication partner training for parents and teachers to help them pause and become comfortable with long silences that may be necessary in interactions involving AAC (Kent-Walsh et al., 2015; Gevarter and Zamora, 2018). It was encouraging to see that the adult participants in this study identified that giving the children more time to think and respond in interactions was important. Linda's mantra, "less talking, less demands, and more time" clearly resonates beyond this study. Linda described what this might look like in an AAC interaction "[to] not ask so many questions in different ways. Ask it once clearly and shush." This is important to other children who use hi-tech AAC, who have reported that "they want their [communication] partners to allow enough time for the answer to be expressed and to wait for their turn – without interruptions" (Midtlin et al., 2015, p. 1265). Although AACtion Heroes was not intended as explicit communication partner training, it is encouraging to see that the adult participants identified the importance of giving more time through their own reflections and experience of participating.

As well as pause time within AAC interactions, people investing time in having conversations with hi-tech AAC users has been raised as important to adults who use AAC (Smith and Murray, 2016) and parents of children who use AAC (Batorowicz et al., 2014). This concerns macro time: not just pausing more, but setting aside enough time to have a full and meaningful conversation with the child. Impatient partners are particularly problematic for children if they are trying to move beyond small talk and express their thoughts and ideas (Batorowicz et al., 2014). In the main study, Kate identified communication partner impatience as problematic and discussed "giving them [the child participants] the time and not being like ((drums fingers on table impatiently))". Her

observation is understandable given that the interactions in AACtion Heroes were geared towards exploring opinions and ideas. Linda discussed the idea that extra sessions, not just seconds, were needed for children with CCN to express their views and ideas. This prompted her to set-up an advocacy group in which children who use AAC had more than one session to address the same topic as their naturally speaking peers in their school, if they wished.

The dual focus on micro and macro time may reflect two facets of expressive communication. Firstly, children who use AAC need extra time within an interaction, even when they already know what they want to say, due to the slow pace of communicating through the AAC mode. Secondly, children who use AAC are not routinely asked their opinion, therefore they may need extra time to think before they respond. That is, they may be well practised in saying (and knowing) what they want, yet they may need time to explore and consider their views on a topic before expressing it. This will require extended interactions and perhaps many opportunities to discuss the same issue. In this way, investing macro time may be related to diversifying communicative functions beyond requesting. Whilst expressing (known) basic wants and needs may require additional micro time, consideration and expression of views and ideas requires additional micro and macro time.

AAC and Behaviour

The term 'behaviour' loomed large throughout the data in this study and is present across each thematic network. Despite being ostensibly a neutral term, when the adult participants used the term 'behaviour' or 'behaviours' it always implied negative or challenging behaviour. School-aged children with CCN may use challenging behaviour as a means of expressing themselves (Ousley et al., 2020). Indeed, the children who participated in the main study had a history of using unwanted behaviour in the classroom. The teaching staff had experience of using Antecedent Behaviour Consequence (ABC) approaches which are widely accepted best practice in special education settings (Webster, 2020). Although the ABC technique does place some emphasis on identifying the environmental context and situation that lead to the behaviour, the 'problem' is still very much located in or with the child. Similarly, researchers aiming to replace behaviour with an AAC mode claim that

deficits in communication in people with disabilities are the cause of challenging behaviours (Ousley et al., 2020). The problem is located in the person with CCN. This suggests even in an educational setting, a medical model perspective on children's behaviour takes precedent.

Pre-empting and avoiding triggers for unwanted behaviour underpinned the rationale for various decisions made by the teaching staff in this study, including: removing access to technology in the classroom; avoiding topics of conversations; and not adding vocabulary to a child's AAC device. In the pilot study, one child participant arrived at the session without her communication aid; it had been taken away from her in the previous class because she was watching YouTube videos instead of listening to the teacher. Clearly, strategies for managing children's behaviour can have huge implications for children who use hi-tech AAC. On the one hand, the adult participants in this study made their own observations of how introducing hi-tech AAC had helped reduce unwanted behaviour (5.5.2). Yet, in certain situations these same children were subjected to having their voice limited and even confiscated if they 'misbehaved'. This suggests managing children's behaviour in the special education setting is a complex issue. If using AAC can be an artefact for both preventing and promoting unwanted behaviour, the 'problem' may not be located in individual children or their means of communication. Rather, unwanted behaviour is a social construct; a product of the situation and the rules associated with the interactional context. For school-aged children who use AAC rules are constructed and then enforced by adults in the school setting (Gillet-Swan and Sargeant, 2018). Adult-led decisions and beliefs about children's behaviour have a potential impact on children's ability and opportunity to access their AAC system.

There were no instances of negative behaviour observed in any of the sessions included in this study. This may be because the AACtion Heroes approach provided children with other means of expressing themselves. Perhaps more importantly, the children could choose to participate – or not – in the activities. They were not expected to do things they did not want to do, unlike other school activities which are compulsory. Kate reflected on this "I don't think it's necessarily behaviour all of the time it's down to what they're learning and how they're learning it [...] maybe this bit more of a relaxed approach can get the better out of people." AACtion Heroes offered a different lens through which to observe children

who used unwanted behaviour in the classroom. There was an observable absence of unwanted behaviour from children participating in this study; children who were known to use such 'behaviour' in their classroom. Therefore, this study provided some evidence to suggest that the children's behaviour was indeed related to the educational rules and curriculum demands and was not simply a result of their 'deficits' in communication. Nevertheless, the AACtion Heroes approach cannot claim to be a means of remediating children's unwanted behaviour – nor was it designed to be so. Instead, it offers a different perspective on what causes children's behaviour which may help teaching staff think more broadly about how behaviour can be managed. This concept is very important for children who use AAC. Undoubtedly, teaching staff in special education settings are under pressure to manage unwanted behaviour but this should not be at the expense of children's expressive language development and access to modern technologies. Like all children, those with CCN need to learn the rules of communication in different contexts and the potential differences between using technology for school-work and recreation. Handled and supported appropriately, both mainstream and AAC-dedicated technologies enable children's rights to expression (McLeod, 2018). Subsequently, limiting and removing access to technologies in the name of behaviour contravenes their human rights and the evidence from this study suggests it remains imperative that other means of managing these situations continue to be sought and found. AACtion Heroes may offer educators a different lens through which to view and manage AAC and behaviour.

6.5. Limitations of the study

This research set out to explore ways of hearing the views of school-aged children who use hi-tech AAC. However, due to various issues around recruitment and parental consent only one hi-tech AAC user was recruited to the main study. This means that conclusions about co-construction processes in interactions mediated through hi-tech AAC, and the child's view on the AACtion Heroes approach, are drawn from a single-case study. Qualitative exploratory research is not intended to be universally applicable; care must be taken in applying Cai's perspectives and ways of interacting to other hi-tech AAC users.

The other child participants in AACtion Heroes were low-tech AAC users, therefore the approach does not explicitly require hi-tech AAC. The applicability of the findings to other children with CCN is implied, but would benefit from further research, for example by interviewing other children with CCN, both low and hi tech AAC users.

The study intended to explore peer interactions, however the children in the main study rarely interacted together, and it was not clear from the data why differences in the pilot and main study were so pronounced. Therefore, few conclusions about the interactions between children who use hi-tech AAC and their peers with CCN can be drawn from this study, and further research would benefit from a focus on developing and understanding peer interactions.

The research approach comes with its own limitations. This was an exploratory study which addressed four research questions through four different methods. The findings raise many interesting avenues of debate and reflection on AAC practices with several areas for further research; however, there are methodological limitations inherent in exploratory research. The themes and subthemes identified through thematic and framework analysis emerged from multiple data sources with the aim of including child and adult perspectives. This analysis is my own and it is possible that another person would have interpreted the data differently, establishing other themes and conclusions. As the researcher with a vested interest in the research, I was a central part of the data I was analysing, which impacted my interpretation of the findings.

The interactions that were analysed in this study were videoed under quasi-naturalistic conditions. That is, although the interactions took place in the everyday school setting, they occurred within an exploratory child-led approach which I designed. How AACtion Heroes would work in different settings, particularly if the researcher is not present, is not clear from the data. The claims are not automatically generalizable to other settings, or to all children who use AAC and their communication partners. That said, positioning this study's findings within existing literature suggests that there are generalizable outcomes: Visual interaction analysis revealed both well-known and novel characteristics of co-construction in AAC mediated interactions. Nevertheless, the interpretation of the data is my own and I recognise that many other interpretations may be available and valid.

Despite the limitations to the study's conclusions and methods, Heath and Luff (2018) point out; "the naturalistic experiment provides a unique opportunity to explore the consequences of particular ideas and developments [and] demonstrate their potential contribution" (Heath and Luff, 2018, p. 483). Visual ethnographic and interaction analysis has allowed me to explore the consequences of being child-led in a special education setting. Like the exploratory study, the findings demonstrate the potential contribution that participatory principles could have on clinical practice and research. The implications for any future application of AAction Heroes, as well as broader implications for clinical practice and research are discussed in the following chapter.

7.0. Chapter 7: Conclusions and recommendations

7.1. Implications for the AACtion Heroes approach

The research findings provide some evidence to suggest that AACtion Heroes is a viable and innovative approach for hearing the views of school-aged children who use hi-tech AAC in the special education setting. Further, the research suggests that AACtion Heroes may be a useful form of communication partner training, i.e., collaborative reflective practice with adults who support children who use hi-tech AAC and their peers with CCN in the special education setting. Throughout the thesis, I have avoided using terms such ‘intervention’ to describe the approach, which by its very definition implies a need to address an impairment or illness (OED, 2021) and measure change in individual skills (Barnes and Bloch, 2019). Nevertheless, there is no natural language environment for aided language learners, so it follows that support must be planned for and actively promoted (Therrien et al., 2016). AACtion Heroes was designed to hear children’s views through promoting child-led interactions in the everyday school setting. As such, it provides a much-needed environmental AAC ‘intervention’ that accounts for real, rather than clinical settings (Yorke, 2021). AACtion Heroes assumes there is no one-size-fits-all approach for understanding and supporting AAC interactions: as expressed by adult participant Kate, “we are learning together”.

Arguably, the focus of AACtion Heroes is not actually on hi-tech AAC. It transpired through its delivery, that hi-tech AAC is just one tool with which a child with CCN could express their views. The focus is on hearing children’s views on school and taking them seriously (Gillett-Swan and Sargeant, 2018). This research has added to the evidence suggesting educational settings are not inherently structured to respect children’s right to expression (Gillett-Swan and Sargeant, 2018). Therefore, adults need to act, take the lead to be child-led, and adapt the environment so that children with CCN can exercise their right to expression at school.

Although AACtion Heroes is potentially viable, for any future use of the AACtion Heroes approach I would recommend some adaptations. Firstly, in addition to ensuring the support of the headteacher, including the class-teacher in the AACtion Heroes sessions may increase carry-over of identified facilitative strategies to the classroom environment and

make meaningful changes to the everyday interactions of children who use AAC and their peers (5.4.1.). Secondly, adult participants identified that conducting AACtion Heroes early in the school year may facilitate continuity of learning (children were reported to take more absences in the summer), as well as ensuring that child-led strategies have maximum impact over the school year (5.5.2.). Finally, it may be that some training of the facilitator would be required, for example, to enable a different SLT to facilitate the AACtion Heroes approach. Although the activities and resources would be familiar to SLTs who support aided communicators, the child-led philosophy, and collaborative discussions (rather than explicit training) with adults does differ from typical AAC interventions. With these adaptations, AACtion Heroes may be a viable approach for use in the special education setting. It is underpinned by children's right to expression and recognises the skills and achievements of children who are learning to become aided communicators.

Article 12. Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.

Article 13. The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice.

(UNCRC, 1989)

AACtion Heroes goes some way to meeting the right to expression of views for school-aged children who use hi-tech AAC. Importantly, it goes beyond rhetoric, not only asserting that children with CCN have the right to express their views and ideas but offering an actionable and practicable means of doing so in their real-world special education setting.

7.2. Implications for typical school based AAC interventions

Many AAC interventions focus on enhancing the linguistic skills of children who use AAC. Though important, linguistic skills are not the only facet of communication. Further approaches are needed which emphasise co-construction as the central characteristic of AAC interaction, that is, provide holistic support for interactions which are mediated

through hi-tech AAC, rather than focussing on an individual's competence in sending a message via an AAC system. An AAC utterance is not simply a replacement for speech, yet the concept of *co-construction* in AAC interactions remains somewhat in the realms of AAC research. This needs to be translated into clinical practice, not least for teachers and LSAs in special education settings who are attempting to develop children's aided language in their daily lives.

As evidenced by this research, there is a paucity of AAC training options for school staff. Behaviourist PECS training is widely available yet focusses only on supporting children to request needs or wants with symbols. Many other characteristics of AAC interactions need to be highlighted if adults who are responsible for the child's learning are to support them effectively. This research has highlighted several recommendations for adults in an educational setting, for supporting children who use hi-tech AAC to communicate at school. These concepts are not necessarily confined to the AACtion Heroes approach but are findings that emerged from this research and have implications for general practice. For example, using multi-modal resources such as photographs to support AAC interactions (6.3.1.) and prepare children for social media interactions (6.4.2), having a shared communicative goal with the child whilst aided language modelling (6.3.3.), moving beyond requesting to the expression of views and ideas (6.4.3.), understanding the importance of micro and macro time for interactions mediated through hi-tech AAC (6.4.3.), and reconsidering AAC and behaviour from a children's rights perspective (6.4.3.). Furthermore, team reflection on multi-party AAC interactions in the classroom could be beneficial (6.3.2). By working together, the teacher, LSAs, and peers could facilitate an AAC mediated contribution to class discussions. This may involve, for instance, the LSA using aided language modelling whilst the teacher facilitates the other children in the class to leave space for an aided utterance and/or posing a question or comment that ensures the utterance-under-construction remains relevant. Weekly reflection on how staff are maintaining and improving their approach could be beneficial for interactions mediated through hi-tech AAC in the classroom.

7.3. Implications for research

7.3.1. Participatory research with children who use AAC

The literature review highlighted a small-body of research which has attempted to hear the perspectives of children who use hi-tech AAC on their lives, but further representation of this cohort of children in participatory studies is warranted. This research study has shown that photography is an easily accessible activity for children who use hi-tech AAC (and their peers with CCN) over which they have agency. Photographs provide a strong visual for children to set the topic of conversation and provide a context for further, multi-modal, discussion. As previously stated, photographs have potential for supporting the everyday interactions of children who use hi-tech AAC at school. Furthermore, photography, as part of a toolkit of creative multi-method activities, can be recommended as a means of including children with CCN who may also use hi-tech AAC in participatory research studies. However, there is a significant caveat in that each activity should be undertaken with a genuine curiosity about the children's views and continuous reflection on how you know what they are saying. It is likely that adults researching with children with CCN will have to 'tidy-up' the expressive form to convey the child's views to a wider audience. It is important to ensure that the 'tidied-up' form remains faithful to the child's views and ideas (6.3.2.).

7.3.2. Multi-party AAC interaction research

AAC interaction research is predominantly dyadic and involves a child who uses AAC and one other naturally speaking interlocutor. This research begins to address the gap in knowledge regarding multi-party interactions mediated through AAC in the school-setting. However, further research into multi-party interactions (including peers with CCN) is warranted, especially as children who use AAC are highly likely to communicate in multi-party contexts at school, home, and the community. This research can recommend methods for capturing and analysing multi-party, multi-modal interactions which are described below.

The simultaneous transcription method described in section 3.7.3. allows the clear transcription of an interaction when more than two interlocutors are present using standard AAC notation (von Tetzchner and Basil, 2011; Higginbotham and Engelke, 2013). This was

particularly useful for capturing the interactions in a small group activity at school, however, may also have utility for other small group settings in the community or family gatherings. The method highlights when dyadic exchanges cross over into group interactions, or indeed, if the interaction involving a person using AAC is in fact a dyadic exchange within a larger group context. This approach to transcription is very time intensive and would not be practical for clinical applications. However, for research, it offers a helpful starting point for transcribing any multi-party AAC interaction and a quantitative or qualitative analysis could be applied.

Although originally designed for the qualitative analysis of workplace interactions, the visual interaction analysis based on the work of Heath and colleagues (2010) proved invaluable for capturing the visible actions and artefacts as well as talk which are pivotal in interactions mediated through hi-tech AAC. It combines elements of CA used in many other AAC interaction studies, whilst having the additional benefit of illustrating the visual in minute detail. This is particularly helpful in capturing the everyday interactions of children who use AAC but are multi-modal communicators as there are frequently instances where no talk (spoken or AAC utterances) is observed, and analysis methods must fully capture the child's use of other communication modes. Furthermore, visual interaction analysis does not hold a hierarchical value in communication – talk is not superior to hi-tech AAC utterances, hi-tech AAC utterances are not superior to low-tech AAC, or natural gesture. Heath *et al* (2010) are explicit in highlighting that all interactions involve talk, visible actions, and artefacts. Indeed, some workplace practices such as surgery rely on the ability of the interlocutors to understand and interpret each other's unspoken orientation to artefacts in the interactional context (Heath et al., 2010). It is a methodology that values the participant's skills and techniques in achieving their own aims and practices. For researchers looking to move away from impairment-based research and highlight the skills and achievements of children who are learning to become aided communicators, visual interaction analysis is a thoroughly useful tool.

7.4. Personal reflection

I started this research in 2016. A strange year. I got married, The UK voted to leave the EU, and reality TV star Donald Trump became the president of the United States. Amongst the clamour of populism in the UK was the Tory²³ government's attempt to repeal the Human Rights Act (1998). A bizarre idea that continues to rear its head, suggesting we should stop European Court rulings in the UK by repealing the rights of all human beings.

I started collecting data in a special education school in 2017. Arguably, a special education setting is populated by the most vulnerable people in society where the need for the Human Rights Act (1998) and its protection from discrimination and right to expression is felt acutely. Thankfully, although 'Brexit means Brexit', the Human Rights Act means our rights are (currently) protected in domestic British law. I pressed on and finished collecting the data in 2018.

I had a baby. Twelve months flashed by and I'd been through 4000 nappies, two Prime Ministers, and one biblical flood. Roll on 2020. We all know how that went. I sat analysing data every nap time in 'lock-down'. The Queen invoked the Blitz spirit in her April 2020 speech to the nation. Two months later Vera Lynn died. I thought about the children in my study and hoped they were coping with the school closures. My 'typically developing' toddler was causing chaos in my living room, so what about those families with children with CCN? No amount of virtual Joe Wicks P.E. lessons and Zoom yoga was going to sort this out.

I know you know all this: The global pandemic, Black Lives Matter movement, a Joe Biden win, accusations of electoral fraud, climate emergency, bizarre weather, lock-down 3 (or was it 4?), Israel and Palestine, Afghanistan ... (I keep coming back to add to this list). The question is, did it have any effect on the research? Of course. It's a piece of research underpinned by the idea of human rights for all citizens, which itself is constructed through a lens of Western liberalism and democracy. These ideas have been contested on the mainstream centre stage over the past five years. When I started out in 2016, I had no idea that the theories and ideologies underpinning the research approach would become so politically relevant (controversial?).

²³ A colloquial term used to mean the British Conservative Party or its supporters.

Despite the global-level chaos and national uncertainty, this local research was a worthy use of time and I sincerely hope it could go on to enrich the lives of children who use AAC. The process of conducting this research has certainly enriched my life and revolutionised the way I view many things, but especially my profession.

I spoke in the discussion (6.3.2.) about balancing the tension between my different roles as I was conducting the AAction Heroes approach: the project leader, group facilitator, communication and AAC expert, and novice student. To some extent I have taken these identities with me into my clinical role as a speech and language therapist. My belief that AAction Heroes can offer a real-world approach for children who use AAC in the special education setting, mirrors my belief that the qualitative researcher has much to offer the real-world approach of the SLT clinician. Since beginning this PhD journey I have struggled to wear the qualitative researcher uniform, it always felt uncomfortable over my well-worn speech and language therapist outfit. I found this in my notes from December 2017:

I am trying to become some sort of researcher, someone who knows what they are talking about. I feel like I'm moving away from the therapists but that is distancing me from my colleagues, and I don't feel that much closer to any researchers. It's lonely out here in the middle trying to forge your own identity. Which hat should I wear today? Neither of them seem to fit anymore. I need to become something else entirely.

I truly do feel like something else entirely now. Someone with a sprinkling of therapist and a dash of researcher and a much better recipe with both: the whole is more than the sum of its parts. I thought being a clinician would make me a good researcher, but taking the research path - and doing this particular kind of research - has made me a better clinician: I trust children's innate desire to interact, I trust people's knowledge and expertise in their own lives, I am getting better at quieting the 'communication expert' and have stopped feeling duty bound to 'train' others by imparting everything I 'know' on the subject! I strongly believe that a good grounding in qualitative epistemology and associated research approaches would make for much better SLT students which is perhaps overlooked in some SLT training programmes.

With a background in speech and language therapy and specifically quantitative research I thought I was new to qualitative approaches. However, I think, on some level, I

have long been a qualitative 'believer'. Though I am the product of an essentially positivist education system my instinct has always been to question assumed truths and consider reality as shifting, constructed, and therefore deconstruct-able. When I was a little girl, I hated pink. No pink dresses, no pink dollies, no pink for me. What a strange little girl. When I was about 10 years old, I was at a friend's house voicing my dislike for pink (I have always been forthcoming with my views) and her mother told me that until the second world war, little boys wore pink. It was only due to soldiers wearing blue uniforms that the post-war craze for insisting boys wear blue and girls wear pink began. And there it was, the bombshell that reality was not as it seems. The idea that I was weird for being a girl and not inherently loving pink was in fact a lie. If I had been born in a different time my brother would be wearing pink. I felt validated. I recognise this moment as an epiphany, my realisation that there is no single truth and reality is relative depending on who, where, and indeed when you are. My reality was (socially) constructed...admittedly it took me a considerable number of years before I could label it in this way.

Nevertheless, when it comes to theories of communication I am bound to my training. As this thesis has discussed, speech and language therapy courses (certainly when I trained) focus on the quantifiable and measurable substrates of communication, linguistics, semantics, syntax, morphology etcetera. While being interesting and in some cases hugely relevant, it has always jarred slightly with me; working on syntax does not necessarily improve a child's participation in (and enjoyment of) school activities. At some point, the fun and function of interacting with others has been overlooked. Now the focus on these factors is increasingly valued within the profession: we attempt to quantify and measure participation and well-being (Enderby, 2014) of an individual as if it is a fixed-state. Becoming a qualitative researcher has helped me explore, understand, and reconcile my underlying misgivings of my speech and language therapy training. I now appreciate I am part of a profession that is striving to support people in that most fluid and human of acts, communication, whilst doing its utmost to prove its value in the widely accepted positivist and objective view of reality. That's no easy task! But therein lies the excitement. There is no other discipline where being a clinical researcher holds so many possibilities for the exploration and application of useful ideas.

I hope that the AAction Heroes approach is a small step forward in terms of realising the rights of school-aged children who use AAC to voice their views and ideas. This research is a starting point for understanding AAC interactions in the special education setting. I hope that it may lead to other avenues and approaches to supporting children who are learning to become aided communicators in ways which value their agency. Interaction with others allows us to construct our world and sense of self. Its not just about saying what we think, its about being genuinely listened to and taken seriously by the people we interact with.

8.0. Glossary

Term	Definition
AAC	Augmentative and Alternative Communication
AAC system	The whole group of components that a person uses to communicate which could include hi-tech and low-tech and no-tech AAC.
CCN	Complex communication needs. This is an umbrella term for severe speech, language, and communication impairments which may include difficulty understanding and using spoken language as well as intellectual, physical, or sensory difficulties which impact communication.
Communication partner/s	The person/s with which the AAC user is communicating.
Everyday context/setting	An environment where naturally-occurring interactions can be studied, rather than interactions in controlled or contrived conditions.
Hi-tech AAC	High-technology communication aid. An electronic communication aid with complex and dynamic screen displays. Also known as Voice Output Communication Aid (VOCA) or speech generating device (SGD).
Interlocutor/s	The person/s engaged in an interaction
Low-tech AAC	Low-technology communication aid which is paper-based. For example, a symbol-based chart or book with personalised vocabulary for the AAC user.
LSA	Learning support assistant
Mainstream school	Primary or secondary schools which cater for the general population of children, largely (but not exclusively) typically developing children with no identified SEND.
Material artefacts	Objects in the communication situation which a person may use to facilitate an interaction. For example, using a book to mediate a discussion about the pictures or narrative.
Multi-modal communication	The set of tools and strategies with which a person communicates. This will include a variety of modes, for example, hi-tech AAC, low-tech AAC, non-verbal communication, and verbal communication.
Naturally-speaking	Speech or verbal communication produced vocally by an individual and not produced via hi-tech AAC.
Non-verbal communication	Forms of communication that do not use words but may be gestural or vocal, for example, laughing, vocalisations, pointing, facial expressions, body language, etcetera.
Photo-elicitation	A technique used in research, especially in interviews, whereby a photograph is used to prompt a discussion or topic of interest with the interviewee.
SEND	Special education needs and disabilities. A term used to describe children in the UK who have been identified as having an issue which impacts their ability to learn.
Shared communicative goal/project	An alignment in understanding between the adult and the child as to the purpose of the AAC message they are co-constructing. In

	particular, an utterance which is reflective of the child's communicative intent.
SLT	Speech and language therapist
Special Education Setting	Also known colloquially as Special Schools. A specific school in the UK which is designed to provide education only for those children with identified SEND.
Verbal communication	Communication using words, that is, speech. Verbal communication may be 'naturally-speaking' (see definition above) or aided speech (i.e., VOCA)
Visible actions	Visible or bodily actions. The ways in which people communicate and interact with each other and the world using their body. Actions can be deliberate or instinctive, for example, turning to look at a person, passing a newspaper to another person, sitting down to be at a child's height, turning on a light to see people more clearly.

9.0. References

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10.0: Appendices

APPENDIX A – ETHICAL APPROVAL

APPLICATION FOR ETHICAL APPROVAL



Introduction

All university activity must be reviewed for ethical approval. In particular, all undergraduate, postgraduate and staff research work, projects and taught programmes must obtain approval from the Academic Ethics committee.

Application Procedure

The form should be completed legibly (preferably typed) and, so far as possible, in a way which would enable a layperson to understand the aims and methods of the research. Every relevant section should be completed. Applicants should also include a copy of any proposed advert, information sheet, consent form and, if relevant, any questionnaire being used. The Principal Investigator should sign the application form. Supporting documents, together with one copy of the full protocol should be sent to the Faculty/Campus Research Group Officer.

Your application will require external ethical approval by an NHS Research Ethics Committee if your research involves staff, patients or premises of the NHS (see guidance notes)

Work with children and vulnerable adults

You will be required to have an Enhanced CRB Disclosure, if your work involves children or vulnerable adults.

The Academic Ethics Committee will respond as soon as possible, and where appropriate, will operate a process of expedited review.

Applications that require approval by an NHS Research Ethics Committee or a Criminal Disclosure will take longer.

Details of Applicants	
Name of applicant (Principal Investigator): Laura Hrastelj	
Telephone Number:	personal telephone number 07834207789
Email address: laura.hrastelj@stu.mmc.ac.uk	

Status: PhD Research Student Paediatric Special Needs Speech and Language Therapist.	Postgraduate Student (Research)
Department/School/Other Unit: Health, Psychology and Social Care	
Programme of study (if applicable):	
Name of supervisor/Line manager: Janice Murray	
Co-Workers and their role in the project: (e.g. students, external collaborators, etc)	
Name: Yvonne Lynch	Name: Juliet Goldbart
Telephone Number:	Telephone Number:
Role: Supervisory team	Role: Supervisory team
Email Address: Yvonne.lynch@mmu.ac.uk	Email Address: J.Goldbart@mmu.ac.uk
Details of the Project	
Title: Aided voices in action! Action research with children who use Augmentative and Alternative Communication (AAC)	
Description of the Project: (please outline the background and the purpose of the research project, 250 words max)	
<p>Background</p> <p>Children with severe speech and language impairments (SSLI) benefit from the use of Augmentative and Alternative Communication (AAC) to support their natural communication. For example, sign, symbols, communication books, communication aids. SSLI are associated with a range of medical diagnoses including autism, cerebral palsy and Down's syndrome. These children have the same right to communicate and participate as their speaking peers.</p> <p>Action research (AR) with children with disabilities is increasing as researchers strive to involve them in the issues that affect their lives. Nevertheless, involving children who are non-speaking is difficult and methods of doing so need to be developed. Engaging children who are typically recipients of AAC interventions in AR could advance practice in the field of AAC. If children with SSLI can be facilitated to communicate successfully across stages of a AR project, it may be possible for them to help design their own AAC interventions and communicate their recommendations to others.</p> <p>Research questions:</p> <p>How do children with SSLI engage in using an Action Research (AR) approach to record information and exchange ideas and opinions?</p> <p>What range of activities and supports for learning to use hi-tech AAC communication systems would children with SSLI recognise as beneficial to them and their friends who use AAC?</p> <p>Outcome</p>	

<p>The findings of this study will further methodological approaches for involving non-speaking children in AR, and improve intervention for children who are learning to use their communication aids.</p>
<p>Describe what type of study this is (e.g. qualitative or quantitative; also indicate how the data will be collected and analysed). Additional sheets may be attached.</p> <p>Qualitative methodology with a focus on action research is needed to capture the lived experiences of children who use AAC, and support them to collect, organise and report their findings. This is a qualitative study based on the Mosaic Approach (Clark et al., 2011) conducted in two phases.</p> <p>Phase one: A group of 4 peers with communication difficulties will participate in a research project over a minimum of 6 weekly sessions at their school. The group will include at least one child who uses an electronic communication aid and other group members may use other forms of AAC.</p> <p>Children will be supported to conduct their own research with regard to their chosen topic. Data collection methods will vary depending on the child's needs and abilities and could include video, photographs, symbol-based communication boards, drawing and objects. The children will be facilitated to work together to create a 'research report' which could take a multi-media rather than written form. This will be shown in a school-assembly to stakeholders who could affect change given the research findings.</p> <p>The researcher will then reflect on AR process including video of the research meetings, and evaluate what methods were most successful in facilitating the children's participation.</p> <p>Phase two: Phase 2 will use methods identified in phase 1 to conduct a further action research study with a specific focus on identifying a range of activities and supports for learning to use hi-tech communication systems. As in phase 1, children in the group would be AAC users with a minimum of one child being a communication aid user. The children would produce a 'research report' that could be used to disseminate their findings to practitioners in the field of AAC as well as other children who are learning to use a communication aid.</p>
<p>Are you going to use a questionnaire? NO</p>
<p>Start Date / Duration of project: September 2016/ 3 years</p>
<p>Location of where the project and data collection will take place: UK – primarily Wales and Manchester</p>
<p>Nature/Source of funding MMU funded studentship</p>
<p>Are there any regulatory requirements? NO</p>

Details of Participants
<p>How many? 8 child participants in total Phase 1: 4 children who use AAC including at least 1 electronic communication aid user Phase 2: 4 children who use AAC including at least 1 electronic communication aid user</p>
<p>Age: Phase 1: Children with communication difficulties between the age of 7 -12 Phase 2: Children with communication difficulties between the age of 7 -12</p>
<p>Sex: Male and female</p>
<p>How will they be recruited? (Attach a copy of any proposed advertisement) Participants will be recruited via gatekeepers within educational placements. Specifically, the researcher will contact the head-teachers of schools with pupils with special educational needs.</p>
<p>Status of participants: (e.g. students, public, colleagues, children, hospital patients, prisoners, including young offenders, participants with mental illness or learning difficulties.) Children with a communication difficulty that means they communicate using an electronic communication aid or other low-tech means, e.g. symbols or signs. These children may have a range of medical diagnoses, e.g. learning difficulties, autism, cerebral palsy, developmental delay.</p>
<p>Inclusion and exclusion from the project: (indicate the criteria to be applied).</p> <p>In each phase the project will include a at least one child who has been learning to use an electronic communication aid for a minimum of 24 months, and is now able to use a minimum of 10 symbols/buttons consistently in order to communicate with another person. The children must be able to use their communication aid at school.</p> <p>The other 3 group members will be peers aged 7 -12 who attend the same school as the communication aid user and who use any form of AAC to support their own communication.</p> <p>Teenagers will not be included in this study</p>
<p>Payment to volunteers: (indicate any sums to be paid to volunteers). NONE</p>
<p>Study information: Have you provided a study information sheet for the participants? YES (Please attach a copy)</p> <p>Please see separate sheets for parents and children</p>
<p>Consent: (A written consent form for the study participants MUST be provided in all cases, unless the research is a questionnaire.) Have you produced a written consent form for the participants to sign for your records? YES (Please attach a copy)</p> <p>.Written consent form is for parents only (see attached)</p>
Risks and Hazards
<p>Are there any risks to the researcher and/or participants?</p>

(Give details of the procedures and processes to be undertaken, e.g., if the researcher is a lone-worker.)

It is not anticipated that discussions regarding AAC will result in the participant's emotional distress or disclosures of harm. However, in phase one children will be discussing issues of their own choice and could feasibly become distressed or disclose experiences which were upsetting. Should issues arise at any point in phase one or two, the researcher will adhere to the relevant school's policies, e.g. Child Protection policy. The researcher will cease interviews/group discussions immediately if participants show signs of distress and subsequently signpost to relevant agencies such as counselling services if appropriate, as outlined by the MMU 'distress protocol for qualitative data collection'.

State precautions to minimise the risks and possible adverse events:

All data collection and interaction with children will take place in a familiar environment, i.e. their school. This will ensure that the environment and facilities are suited to their physical needs, e.g. some of the children may be wheelchair users.

The researcher will request that a support assistant from the school with who the children are familiar, also joins in with the group sessions so that children are comfortable with the new situation.

What discomfort (physical or psychological) danger or interference with normal activities might be suffered by the researcher and/or participant(s)? State precautions which will be taken to minimise them:

Child participants will be seen in an environment in which they are highly familiar and comfortable in order to minimise any potential disruption to their routine. The researcher will attempt to include a familiar member of staff to take part in the group sessions so that the children have someone on hand who is familiar with them and their needs.

Children may have accompanying medical needs that can cause them discomfort and the researcher will work closely with the adults who are familiar with the child's needs to ensure that they have the correct equipment to support them, e.g. adaptive seating.

In the event that the researcher is emotionally impacted or distressed by the content of the interviews, she will seek mentoring and support from her supervisory team.

Ethical Issues

Please describe any ethical issues raised and how you intend to address these:

Children with communication difficulties may not be able to verbally assent or dissent to involvement in the research activities. The researcher will draw on her experience as a paediatric special needs speech and language therapist to pay close attention to the children's non-verbal behaviours. For example, if a child withdraws from an activity this will be interpreted as dissent and the child will not be persuaded to rejoin the activity in anyway. Assent and dissent will be an ongoing process throughout the 6 weeks and children will be allowed to withdraw or join in with any activity they choose. This will differ from a school-based task in that they would typically be expected to do what they have been asked. The researcher will attempt to overcome this hierarchal 'teacher-pupil' relationship by respecting the child's choices and demonstrating that they do not have to take part if they do not want to.

Safeguards/Procedural Compliance

Confidentiality:

Indicate what steps will be taken to safeguard the confidentiality of participant records. If the data is to be computerised, it will be necessary to ensure compliance with the requirements of the Data Protection Act 1998.

The participants will be guaranteed anonymity in the study and will be given pseudonyms throughout written text. No identifiable information will be given in the text, e.g. name of school.

Children are likely to create their own videos/photographs/stories etc. These will be copied and used by the researcher for transcription purposes only: being viewed by the principle researcher or members of supervisory team.

The children will be allowed to keep their original videos/photographs/stories. The children will also create a final research report which could be in any multi-media form. The report will be shown within the school to other children and staff. Participants will be aware of this and will be supported to only include information that they want to share. Nevertheless, any written report created by the researcher will be anonymised by in terms of participants and school names.

Identifiable information on consent forms will be kept separately to transcriptions and video so that anonymity can be maintained.

If you are intending to make any kind of audio or visual recordings of the participants, please answer the following questions:

How long will the recordings be retained and how will they be stored?

Recordings will be saved directly onto a SD card within the camera. Files will then be transferred and stored on a password protected encrypted memory stick and kept in a locked cupboard on MMU premises. Recordings will be retained until the completion of the project.

6.1.2.2. How will they be destroyed at the end of the project?

Videos will be deleted from memory sticks on completion of the project

6.1.2.3. What further use, if any, do you intend to make of the recordings?

The researcher will make no further use of the recordings.

N.B. The children will be allowed to keep their own recordings if they wish. The researcher will delete her own copies of everything on completion of the project.

The Human Tissue Act

The Human Tissue Act came into force in November 2004, and requires appropriate consent for, and regulates the removal, storage and use of all human tissue.

Does your project involve taking tissue samples, e.g., blood, urine, hair etc., from human subjects?

NO

Will this be discarded when the project is terminated?

N/A

If NO – Explain how the samples will be placed into a tissue bank under the Human Tissue Act regulations:

Notification of Adverse Events (e.g., negative reaction, counsellor, etc):

(Indicate precautions taken to avoid adverse reactions.)

Please state the processes/procedures in place to respond to possible adverse reactions.

Chances of adverse events taking place will be minimised as far as possible by conducting the group sessions in places that are highly familiar to the participants so that they are comfortable and relaxed.

Should issues arise the researcher will adhere to the relevant policies, e.g. Child Protection policy. The researcher will cease discussions immediately if participants show signs of distress and subsequently signpost to relevant agencies such as counselling services if appropriate, as outlined by the MMU 'distress protocol for qualitative data collection'.

Research activities which include child participants will be tailored for their developmental level and needs. Activities will be designed to be enjoyable and accessible so that children do not feel overwhelmed by data collection techniques.

In the case of clinical research, you will need to abide by specific guidance. This may include notification to GP and ethics committee. Please seek guidance for up to date advice, e.g., see the NRES website at <http://www.nres.npsa.nhs.uk/>

SIGNATURE OF PRINCIPAL INVESTIGATOR:		Date
<i>L. Hastelf</i>		12/12/16
SIGNATURE OF FACULTY'S HEAD OF ETHICS:		Date:

Checklist of attachments needed:

1. Participant consent form
2. Participant information sheet
3. Full protocol
4. Advertising details
5. NHS Approval Letter (where appropriate)
6. Other evidence of ethical approval (e.g., another University Ethics Committee approval)



Name: **Laura Hrastelj**

Course: PhD

Department: Health, Psychology and Social Care

Manchester Metropolitan University

Email: laura.hrastelj@stu.mmu.ac.uk

Project title: Aided voices in action! Action research with children who use augmentative and alternative communication (AAC)

Dear XXXX,

I am conducting an exciting new project with children aged 7 -12 years who have limited speech and use AAC to support their communication. I am contacting you to ask if XXXX School could facilitate this research.

What will the project involve?

The project will involve the researcher, who is an experienced speech and language therapist with enhanced DBS clearance, coming to your school to run a group called 'Action Heroes!' for 4 children who use signs and symbols to communicate. At least one group member should be a hi-tech communication aid user. The group sessions will last approximately 45-60 minutes and run once a week for 6 weeks. The children will be facilitated to conduct their own research and report their findings to the rest of the school. In order to do this, it would be helpful if a support assistant from the school could join in with the sessions. This is to ensure the children are with a person who is familiar to them and their style of communication.

Why is the project being done?

The study is part of my PhD research project. Previous research involving children and young people with disabilities as partners in projects have had a positive impact on the children's confidence and self-esteem. I would like to use this approach with children who have difficulties communicating. I'm sure you appreciate that though they can be the most difficult children to 'hear', they have unique views and opinions that deserve to be listened to.

Why should we take part?

It is hoped that the children involved will find the activities interesting, enjoyable and help them to get their ideas across to people which can be an empowering process. Findings from this project will help other children with limited speech to take part in research on a range of issues that affect them. For example, activities that prove effective in this study could be used in other schools and healthcare to ask children what they think of the education and services they receive and how they can be improved.

I would welcome the opportunity to discuss the project with you further and answer any questions you may have. I can be contacted via email: laura.hrastelj@stu.mmu.ac.uk or on my personal mobile 07 XXXX XXXXX.

Yours sincerely, Laura Hrastelj

Participant Information Sheet



Name: Laura Hrastelj

Course: PhD

Building: Brooks Building

Department: Health, Psychology and Social Care

Manchester Metropolitan University

Aided voice in action! Action research with children who use Augmentative and Alternative Communication (AAC)

I would like to invite your child to take part in a research project. They are being asked to take part in this study because they use something other than talking to help them to communicate, for example, pictures, signing or a communication aid. This leaflet is to tell you what the study will involve and help you and your child decide if they would like to take part. Please contact me if you need more information or explanation.

Why is the study being done?

This research project wants to help children who have difficulties with communication to carry out their own research into something they care about. The project will trial lots of different ways to help children who have limited speech to communicate what they have found. For example, they will be asked to take photographs or videos around the school of things that they like, or don't like, or would like to change. Identifying the right ways to do this for your child will be important as it will help your child tell adults in the school what they think.

What does the study involve?

A group of 4 children between the ages of 7 – 12 who use symbols or signs to help them communicate will take part in 6 weekly sessions at their school, XXXX. I will introduce the children to the United Nations Convention on Rights of the Child (UNCRC) using simple language and symbols in order to help them understand that they have rights concerning their survival, development, participation and protection (**see enclosed poster**).

The group of children will decide what they would like to investigate at school. For example, what children in the school think of school dinners? What are their favourite games? Every week the children will have an activity to complete, for example taking photographs or videos, asking staff and other children in the school to complete a survey that we will design together. The group will meet once a week to discuss what the children have found out. Activities will take into account your child's communication and physical needs and are designed to be fun and accessible to all. Children with communication challenges are often marginalised/unable to get across their feelings about things with ease or given the time that they need to do this. This project aims to show how this is possible, if we think creatively and support children to succeed.

Sessions will be videoed so that I can re-watch them later to make sure I do not miss any aspect of your child's messages. These videos will be securely stored on an encrypted memory stick and kept in a locked cupboard at Manchester Metropolitan University. They will only be seen by myself or my supervisors working on this project. When the project is finished, the videos will be deleted.

Any photographs, videos or artwork your child makes themselves will belong to them and they can keep them if they would like to, however, as they may be important aspects of the message they want to tell us, for the purposes of the research a digital photograph of the work will be taken. These photographs would be anonymous, in terms of not showing your child in the photograph.

Why is my child being invited to take part?

I am inviting children between the ages of 7 - 12, who use methods other than talking to help them communicate, to take part in the project.

Children who use aided communication have views and opinions of their own and have a right to be listened to. Their experiences are important and we would like to find easy ways of helping them tell us what they think on a range of issues that affect them.

I have attached a **child friendly information leaflet** so that you can talk to your child about whether or not they would like to take part.

Do they have to take part in the project?

No, taking part is voluntary.

What if they don't want to carry on with the research project?

Your child can leave the project at any point. For example, if they are unhappy doing an activity and want to leave the room they will be allowed to do so. If they decide they would like to join in at another time they will be allowed to do so. They do not have to give a reason if they do not want to take part anymore. You may also withdraw your consent for them to take part in the project at any time without giving a reason. Eventually information from the project will be made anonymous and after that you will not be able to withdraw it, as I would be unable to tell what information related to your child.

My child would like to take part. What do I do next?

You need to sign the attached consent form and return it to your child's school. You can also contact me, Laura **Hrastelj** (surname is pronounced **Rastell**) if you would like to discuss anything further.

Who will see my child's data?

Any information that identifies your child will only be seen by people from the university who are involved with the research project. Data will be stored and protected under the rules of the Data Protection Act. Any data used in the public domain will be anonymous.

Are there any benefits to taking part?

There are no direct benefits in taking part, i.e. the project is not speech and language therapy intervention and does not aim to directly improve your child's communication. Nevertheless, it is hoped that the children involved will find the activities interesting, enjoyable and help them to get their ideas across to people. Findings from this project will help other children with limited speech to take part in research on a range of issues that affect them. For example, activities that prove effective in this study could be used in schools and healthcare to ask children what they think of the education and services they receive and how they can be improved.

Who is in charge of the project?

My name is Laura Hrastelj and I am a qualified speech and language therapist currently studying for a PhD.

I can be contacted through Manchester Metropolitan University (MMU)

Email: laura.hrastelj@stu.mmu.ac.uk

My supervisor, Professor Janice Murray can also be contacted at MMU by:

- telephone: xxxxx

- email: J.Murray@mmu.ac.uk

If you want to discuss or are unhappy about any aspect of the research project you can contact me, Laura Hrastelj, or my supervisor Janice Murray at any point. Alternatively, you can contact a representative of Manchester University who is not involved in the project:

Professor Carol Haigh

- Telephone: xxxxx

- Email: c.haigh@mmu.ac.uk

Parental Consent Form: Please return to your child's school by xx/xx/xx if you would like your child to take part

Title of Project: Aided voices in action! Action research with children who use Augmentative and Alternative Communication (AAC).

Name of Researcher: Laura Hrastelj

Please initial box

1. I confirm that I have read and understood the information sheet for the above project and have had the opportunity to ask questions about the project.
2. I understand that my child's participation is voluntary and they are free to withdraw at any time without giving any reason to the named researcher.
3. I give permission for my child to be video recorded during research project and understand that footage will be used for analysis for this research project.
4. I understand that my child's information will remain anonymous and any video footage will be deleted when the project is complete
5. I agree for my child to take part in the above research project.

Name of Participant (child)

Name of adult (parent/guardian)

Date

Signature

Once this has been signed, you will receive a copy of your signed and dated consent form and information sheet by post.

APPENDIX D – PILOT STUDY CHILD PARTICIPANT INFORMATION LEAFLET

photo

My name is Laura Hrastelj. I am looking for a team of children to help me

I am a researcher. I want to know if children who use signs and symbols can make changes in their school

Do you use signs or symbols to help you talk? Team ACTION-HEROES needs you!

We talk about your rights.

We listen to your ideas

We take ACTION and make changes.




















 ACTION-HEROES meet once every week. We will meet 6 times.
























 You can leave ACTION-HEROES at any time. You decide if you want to go or stay.







 ACTION-HEROES use cameras to look at different ways to use communication aids














 ACTION-HEROES play games to share our ideas. We decide what we like and what we don't like








 ACTION-HEROES take action! We will record a film to show (head-teacher's name) and everyone in school






 how we like to use communication aids

Participant Information Sheet



Name: Laura Hrastelj

Course: PhD

Building: Brooks Building

Department: Health, Psychology and Social Care

Manchester Metropolitan University

Aided voice in action! Action research with children who use Augmentative and Alternative Communication (AAC)

Children at xxxx school have been asked to take part in a research project. They are being asked to take part in this study because they use something other than talking to help them to communicate, for example, pictures, signing or a communication aid. This leaflet is to tell you what the study will involve and help you decide if you are able to support the children over the course of the project. Please contact me if you need more information or explanation.

Why is the study being done?

This research project wants to help children who have difficulties with communication to carry out their own research into something they care about. The project will trial lots of different ways to help children who have limited speech to communicate what they have found. For example, they will be asked to take photographs or videos around the school of things that they like, or don't like, or would like to change. Identifying the right ways to do this for the children will be important as it will help them tell adults in the school what they think.

What does the study involve?

A group of 4 children between the ages of 7 – 12 who use symbols or signs to help them communicate will take part in 6 weekly sessions at school.

The group of children will decide what they like and don't like at school and if there is anything they would like to change. Activities will take into account the child's communication and physical needs and are designed to be fun and accessible to all. You will be asked to advise on these aspects of the project as you know the children best.

Children with communication challenges are often marginalised/unable to get across their feelings about things with ease or given the time that they need to do this. This project aims to show how this is possible, if we think creatively and support children to succeed.

Sessions will be videoed so that I can re-watch them later to make sure I do not miss any aspect of the children's messages. Therefore, it is likely that you will also be on the video footage. These videos will be securely stored on an encrypted memory stick and kept in a locked cupboard at Manchester Metropolitan University.

Any photographs, videos or artwork the children make themselves will belong to them and they can keep them if they would like to.

What do I have to do throughout the in the project?

As you are already familiar with the children and the communication style you will be a vital part of the research project. As an unfamiliar adult, I may miss what the child is trying to say. For example, if they are uncomfortable or if they want to leave. It is hoped that it will put the children at ease if there is a familiar adult present.

At the end of the project, I would like to interview you in order to get your views on the experience and what research methods you felt worked best over the six weeks. However, you do not have to be interviewed if you don't want to. It is OK if you would like to support the children but not take part in the interview.

Are there any benefits to taking part?

There are no direct benefits in taking part, i.e. the project is not speech and language therapy intervention and does not aim to directly improve the children's communication. Nevertheless, it is hoped that you and the children involved will find the activities interesting, enjoyable and help them to get their ideas across to people. This project will help other children with limited speech to take part in research on a range of issues that affect them. For example, activities that prove effective in this study could be used in schools and healthcare to ask children what they think of the education and services they receive and how they can be improved.

Who is in charge of the project?

My name is Laura Hrastelj and I am a qualified speech and language therapist currently studying for a PhD.

I can be contacted through Manchester Metropolitan University (MMU)

Email: laura.hrastelj@stu.mmu.ac.uk

My supervisor, Professor Janice Murray can also be contacted at MMU by:

- telephone: 0161 247 2570

- email: J.Murray@mmu.ac.uk

If you want to discuss or are unhappy about any aspect of the research project you can contact me, Laura Hrastelj, or my supervisor Janice Murray at any point. Alternatively, you can contact a representative of Manchester University who is not involved in the project:

Professor Carol Haigh

- Telephone: 0161 247 5914

- Email: c.haigh@mmu.ac.uk

Adult participant consent form

Title of Project: Aided voices in action! Action research with children who use Augmentative and Alternative Communication (AAC).

Name of Researcher: Laura Hrastelj

Please initial box

I confirm that I have read and understood the information sheet for the above project and have had the opportunity to ask questions about the project.

Consent for use of visual data. There are two options.

Option A: I give permission to be video recorded during the research project and understand that footage will be used for analysis for this research project.

Option B: I give permission for videos and photographs with me in them to be used the researcher to tell other people about the project. For example, in the researcher's thesis, journal articles and conference presentations.

I agree to be interviewed at the end of the project

Name

Date

Signature

Once this has been signed, you will receive a copy of your signed and dated consent form and information sheet by post.

APPENDIX F – PILOT STUDY INTERVIEW SCHEDULE

Adult participant interview schedule

1. Is there anything about AAction Heroes that you felt worked well. That is, if you were going to do it again which bits would you keep?
2. Is there anything about AAction Heroes that didn't work so well, or that you would not do again?
3. What do you think the purpose of the AAction Heroes activities were in terms of the children's learning experience?
4. Have any changes occurred in the school that you could specifically attribute to the AAction Heroes approach?
5. Is there anything else you would like to add that we haven't covered yet?



+

AAction Heroes!

Hearing the views of school-age children with SEND who use Augmentative and Alternative Communication (AAC).



Laura Hrastelj
PhD student at MMU
Supervisory team: Prof. Janice Murray, Prof. Julie Goldbart, Dr Jennifer Whittle and Dr Yvonne Lynch.
laura.hrastelj@stu.mmu.ac.uk @LauraHrastelj



Pilot study

Research aim


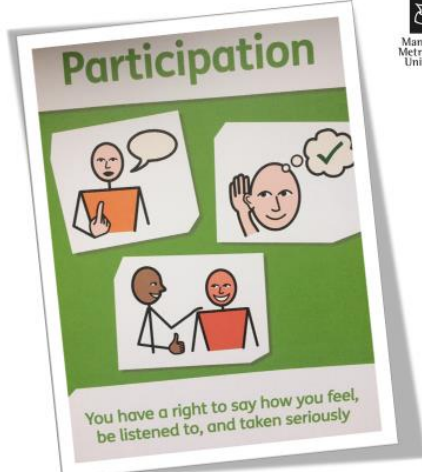
- To identify a methodology that allowed children with complex communication needs (CCN) to participate in research about their lives.

Literature review

- 28 papers that had directly sought the views of children with CCN. Review of methods (not findings).

Research question

- How do children who use AAC engage with participatory research methods to record information, form ideas and exchange opinions?

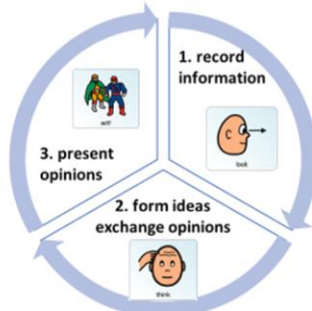


Participants and procedures



4 children in a special education setting aged between 7 and 12 (2 low-tech and 2 hi-tech AAC users)
 2 members of school staff (+ me)
 6 weekly, one-hour sessions to find out what they think about their school

- Final presentation to headteacher and people important to the children who could potentially take action and make changes



- Child-led tour of school
- Child-led photography



- Collaging with photos and symbols
- Drawing
- Group discussion

'AAction Heroes' research kit

Playful equality and camaraderie between adults and children:

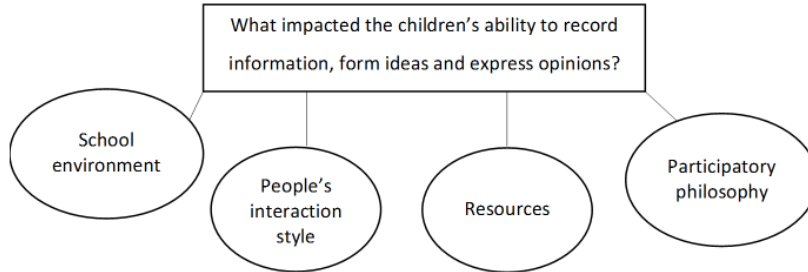
- Children can wear ID badges
- Adults can wear capes
- Adults and children can use symbols to communicate together.



Outcome



Thematic network analysis (Attride-Stirling, 2001) of videoed interactions in each session, researcher reflection journal, and staff interview data revealed four global themes.



Organising theme: Optional

Teacher: "Do you like bubbles?"

Child: "Can I say no?"

(Teacher and child interaction, session video)



Organising theme: Unhurried

Are we leaving enough silence for children to communicate their ideas through technology?

"Let them finish talk not tasks"

(Teacher interview)

Task – word cloud

Think about your favourite place. What single word would you use to describe it?



Organising theme: Equal



"I liked how everyone was equal. Staff and pupils, everyone was equal, everyone had to use the same things, everyone had to use the symbols. [...] it made them feel as a team."
(Teacher interview)

"Maybe getting the adults to use AAC is slowing them down a bit giving the children more time to respond."
(Researcher research journal)



Organising theme: Respectful



To what extent can support staff consider and respect the children's views day-to-day?

Child: "Books home?"

LSA: "No not home, we're here to take photos of things you like."

(Child and Learning Support Assistant interaction – session video)

Using pilot study findings to refine the 'AAction Heroes' approach



1. Storybooks

Co-creating personal storybooks provided a focus and shared communicative goal for the group whilst being open to the children's individual variation and preferences.

2. Multi-methods; multi-modal

Creative mixed-methods complemented the skills and preferences of aided communicators who already use multi-modal communication.

3. Adult reflection

Informal reflection on the session with staff whilst clearing away the room was integral to success of following session.

Adult reflection sessions



ARTEFACTS	What is the impact on the child's ability to convey their perspective?	What could we do next time?
Environment Impact of room Availability and layout of furniture Mobility equipment AAC system		
Resources/Activities Action hero kit (cape, ID badge) AAC symbolcards (opinions/adjectives) iPad/photo technology Collaging materials Child-led tour of school		
People's interaction style peers school practitioners researcher		
Philosophy/Strategies Optional Child decides to take part or not Equal All using AAC Sitting together at the table Everyone gives their opinion Unhurried Structure of the sessions Long pauses in interactions Finish talk not tasks Respectful Accepting any communication mode Presenting ideas to head-teacher Genuine consideration of child's message		

Main study research questions...



1. In the 'AAction Heroes' approach, what *co-creation* processes are observable in interactions mediated through AAC? (over 6 weeks)
2. In the 'AAction Heroes' approach, what *co-construction* processes are observable in interactions mediated through AAC? (in seconds)
3. What contributions from the adult participants are identified as important in the process of storybook co-creation with children who use AAC?
4. Is the 'AAction Heroes' approach a viable way of working in special education settings with children who use AAC?

Parental Consent Form: Please return to your child’s school by xx/xx/xx if you would like your child to take part.

Title of Project: Aided voices in action! Action research with children who use Augmentative and Alternative Communication (AAC).

Name of Researcher: Laura Hrastelj

Please initial box

- 6. I confirm that I have read and understood the information sheet for the above project and have had the opportunity to ask questions about the project.
- 7. I understand that my child’s participation is voluntary and they are free to withdraw at any time without giving any reason to the named researcher.
- 8. Consent for use of visual data. There are two options. If you would like your child to take part in the project then you must consent to option A. This means your child will be videoed during the project, the data will be analysed by the researcher but not shared with anyone else. However, your child can take part in the project and not consent to option B. Option B would allow the researcher (Laura Hrastelj) to use video and photographs in the future to tell other people about the project, e.g. other researchers, teachers, parents etc. You may choose to not allow her to do this, or you may allow her to make use of the visual data for a limited time, i.e. the next 5 years, 10 years, or 15 years. All visual data will be deleted at the time you specify.

Option A: I give permission for my child to be video recorded during the research project and understand that footage will be used for analysis for this research project.

Option B: I give permission for video and photographs of my child to be used by the researcher to tell other people about the project. For example, in the researcher’s thesis, journal articles and conference presentations. Laura Hrastelj may use the data for:

5 years 10 years 15 years

- 4. I understand that my child’s personal information will remain anonymous, i.e. their name and the school’s name will be changed in the researcher’s written reports.
- 5. I agree for my child to take part in the above research project.

Name of Participant (child)

Name of adult (parent/guardian)

Date

Signature

Once this has been signed, you will receive a copy of your signed and dated consent form and information sheet by post.

APPENDIX I - INCLUSION CHECKLIST FOR GATEKEEPER (main study)

Inclusion checklist. Please consider the following factors...	✓
Is the child aged between 7;0 and 12;11 years of age?	
Attention (Cooper et al., 1978) Child's attention is two-channelled and can listen to an adult whilst doing a task. Attention span remains short but can attend in a group situation.	
Child shows joint attention toward an object with a partner, e.g., points at toy/food/person and looks back at communication partner to request or comment.	
Play (Sheridan et al., 2011) Child can engage in role-play, e.g., dressing up as an action hero.	
Understanding Understands basic feelings, e.g., happy, sad, angry, silly, and frustrated.	
Appears to understand and follow general conversation in everyday, familiar situations.	
Understands the following concepts: like/don't like/not sure, think, change/same/different, your/my turn, wait/listen/tell, good/bad/better.	
Expression Has available (and uses) a minimum of 20 symbols to convey a consistent message on communication aid (or for low tech AAC users: signs, symbol-based communication book, word-approximations)	
Beginning to use symbols to comment and/or ask questions with adult support.	
Able to express feelings and wants when supported with a carrier phrase, e.g. I like... X, I feel... X	
Social skills (Sheridan et al., 2007) Could answer questions in a small group situation with three other peers, e.g., in circle time the child could listen to peers telling the group their favourite fruit before giving their own answer.	
Child beginning to negotiate with peers and demonstrates an ability to share toys and co-operate in a short task with adult support, e.g., could be supported to work in a pair to build a Lego model.	

APPENDIX J – MAIN STUDY CHILD PARTICIPANT INFORMATION LEAFLET

photo

My name is Laura Hrastelj. I am looking for a team of children to help me

I am a researcher. I want to know if children who use signs and symbols can make changes in their school

Do you use signs or symbols to help you talk? Team ACTION-HEROES needs you!

We talk about your rights.

We listen to your ideas

We take ACTION and make changes.

















































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 ACTION-HEROES use cameras to look at things to change in school.














 ACTION-HEROES play games to share our ideas. We decide what we like and what we don't like








 ACTION-HEROES take action! We will record a film to show (head-teacher's name) and everyone in school




 what needs to change.

APPENDIX K – CLASSROOM OBSERVATION PROFORMA AND COMMUNICATION STAGES THEORY SHEET

Participant's name:

DOB:

What is communicated?	How is it communicated?	Interaction Skills inc. AAC independence or dependence	Favourite activities and interests	description of AAC system	Physical/sensory needs: adaptive equipment needed

Additional information

Communication stages					
*adapted using Elks and McLaughlan (2012), Blank (2002), P-Scales (2017), Dowden (1999).					
Level of Communication	What is communicated?	How is it communicated?	Interaction Skills inc. AAC communicator profile	Play skills	Approaches being used
Words and Ideas (12-18 months) P level 4 Student Initiated Interaction <i>First words user</i>	Simple words, signs or pictures to request things, ask for more, and expand on the 'messages' above.	Initially uses non-verbal communication but gradually learns words, or uses pictures, symbols or signs to communicate a specific message. Can initiate.	Needs the adult to respond to their communication and provide models of language, sign or picture support. Interactions have one or two turns. CONTEXT-DEPENDENT	Can use several objects at once. Enjoys sorting. Can play with toy objects and can relate these to self/other person.	Total communication approach which may include sign, photographs, or symbols. TEACCH visual supports, timetables and classroom layout. PECS or communication books.
Joining words and ideas (1 1/2 - 3 years) P level 5-6 <i>Combiner</i> Blanks levels 1 and 2	Words / phrases to: Comment and describe Ask "who", "what" and "where" questions Talk about 'here and now'	Uses words, signs, photos or sybols to communicate in short phrases and sentences	Still learning the rules of interaction so needs other children and adults as models to learn from. CONTEXT-DEPENDENT	Can use toys to act out simple daily routines. Begins to use minature toys. Begins to play with others	Total communication approach which may include sign, photographs, or symbols. TEACCH visual supports, timetables and classroom layout. PECS or communication books. Blank 1 Naming things : can label the whole object and match what they are seeing to what they are hearing, e.g. 'show me your drink' Blank 2 Describing things : can begin to label parts of the object and answer simple who, what, where questions, e.g. 'what could you use to eat your yoghurt?'
Abstract words and reasoning (3 - 5 years) P level 7-8 <i>Combiner</i> Blanks levels 3 and 4	Abstract ideas: emerging ability to understands and uses language to talk about things beyond immediate situation. Can plan, question, negotiate, predict, reason.	Uses increasingly complex sentences. By 5 years can use simple but grammatically correct sentences.	Increasingly able to interact appropriately with a range of people. Starts to change the style of interaction depending on the situation. INDEPENDENT?	Enjoys imaginative play. Increasingly enjoys co-operative play. Can eventually take on role of another person	Total communication approach which may include sign, photographs, or symbols. Blank 3 Talking about stories and events, sequencing: can begin to make simple predictions and describe events, e.g. 'lunch is finished, what will happen next?' Blank 4 Solving problems and answering why questions: can begin to justify why things have happened or will happen, e.g. 'why will the drink spill?'

Adult participant interview schedule

1. In your opinion, what was the purpose of the activities undertaken by the Action Heroes group in terms of the children and adult's learning experience?
2. Was there anything about Action Heroes that helped you find out what was important to the children?
3. Did you learn anything new about (child's name), yourself, or the other children?
4. In what ways, if any, could you use things that you have learned or experienced in Action Heroes in other interactions with (child's name)?
5. What was difficult about participating in Action Heroes?
6. Would you consider being involved in Action Heroes again? If so, what would you change next time?
7. Please feel free to add further comments or reflections on participating in the study so far.

APPENDIX M – EXAMPLE OF COMPLETED CRIB-SHEET

ARTEFACTS	What is the impact on the child’s ability to convey their perspective?	What could we do next time?
<p>Resources/Activities Action hero kit (cape, ID badge) AAC symbol cards (opinions/adjectives) iPad/photo technology Collaging materials Child-led tour of school</p>	<p>Moirá’s thoughts...They have stopped all iPad use in class because it was becoming too distracting for pupils, e.g., rushing their work to get an iPad instead of focussing on the task, or technology failing and becoming a source of frustration for them. Videos etc do not always work, e.g. today the videos would not stream properly which meant the children lost focus on the presentation.</p>	<p>We will change the communication page to a dedicated device, i.e. old 18 inch communication aid and not bring an iPad at all. Laura will use few, if any videos in the recap and load them to a memory stick rather than try and stream them through the school system.</p>
<p>People’s interaction style peers school practioners researcher</p>	<p>Linda’s thoughts...Staff anxiety about the potential for children to display negative behaviours can mean we avoid topics of discussion. Perhaps even avoiding putting vocab on a communication aid, e.g. book titles.</p>	<p>We will continue to add vocab to Cs device and encourage him to ask for things using his ‘voice’. But, it’s ok to say no to requests and give an alternative when he can’t have them. Just like we would a child who can speak but can’t have what they want at that moment. C seemed to cope well with this today, i.e. “no you can’t get X from the library now, you can choose from these others.”</p>
<p>Philosophy/Strategies Optional Child decides to take part or not Equal All using AAC Sitting together at the table Everyone gives their opinion Unhurried Structure of the sessions Long pauses in interactions Finish talk not tasks</p>	<p>Kate’s thoughts...Staff seem to be more comfortable in allowing children to leave and rejoin the activities as they wanted to this week. It’s getting easier ‘to go with the flow’. However, the children probably don’t fully understand that it is optional, i.e. “adults are getting better at giving the option even if the children don’t fully get it”. This would be difficult to achieve in a general classroom environment. Giving a choice is ok if that is the desired outcome of the activity, e.g. the point is ‘to give children a choice’. However, this would not work if the task itself needs to be completed which is often the case at school. Perhaps there is a place for both.</p>	<p>Linda commented that she still finds this difficult and feels “if I don’t bring him back he’ll miss out”. However, Cai did rejoin the activity repeatedly today in his own time along with frequent breaks outside away from people. He also said ‘finished’ when he was done. Perhaps this will give us more confidence in giving him a small amount of freedom and respect his non-verbal communication (i.e. moving away when he needs to).</p>

<p><i>Respectful</i> Accepting any communication mode Presenting ideas to head-teacher Real consideration of child's message</p>	<p>Laura's thoughts...Cai seems to need extra time to process spoken language. He will also need lots of extra time to formulate a response using his communication aid. Today we (Laura and Linda) were talking to him whilst he is thinking which is probably overloading him rather than clarifying the question.</p>	<p>Next week we will try and give longer silences after we ask a question to give Cai time to think and formulate a response, rather than asking him again.</p>
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Other points for next week...

Laura noticed Shaun and Cai having 'fun' together last week when adults were not watching. They were giggling and running around outside [headteacher's] office. Kate commented that it's not often these two would have the chance to interact together as they are usually with lots of other class mates. Cai can find them intimidating and will take himself away a lot. Linda and Laura discussed how we could create more opportunities for the children to laugh together, rather than with just adults next week. Shaun has a great sense of humour and laugh, perhaps we could use this to everyone's advantage!

PLAN: Next week we will fill the Box with funny hats and masks etc for everyone to wear and ask people's opinions of each other's outfits. Perhaps we can encourage the boys to laugh/smile at each other if adults are modelling have fun and laughing at each other. The children (and adults) can choose an outfit to wear when we make video messages for [headteacher].

PLAN FOR KOJO – next week Kojo will go to music as usual. Laura will bring in his photos and collaging things just in case he comes back in time to rejoin the activity. However, it is fine for him to miss the whole session.

LINDA- please collect funny hats etc from teachers as discussed!

APPENDIX N – FRAMEWORK ANALYSIS CODEBOOK

Name	Description
RESOURCES AND ACTIVITIES	Adaptations that need to be made to resources and activities which are directly related to the participatory research sessions
Conflicting rules	How to manage different expectations and rules of project compared to classroom, e.g. activities are optional, being allowed to use iPads/screen-based technology
Diverse adaptations	How the diverse children in the group may need same information presented differently to ensure they understand, including making new resources or drawing on existing school resources
Modifying session structure	How session activities can be structured to improve the children's attention and engagement, e.g. follow 10-minute sit-down task with 2 minutes of physical activity.
Response to research activities	Observations on how children respond to novel resources and activities such as Action hero capes, photography, collaging and child-led tour of school.
Troubleshooting technology	Thoughts on how problems with technology affect the children and how problems can be overcome, e.g. presentation not being compatible with school computers
SCHOOL ENVIRONMENT	Consideration of factors that already exist in the school environment which are not related to the research project
Hi-tech AAC system	How characteristic of the device such as size and vocabulary can impact child's communication.
Pre-existing relationships	How the children's pre-existing relationships with peers and adults can impact their communication and engagement in the research session.
Prior events	How events prior to the research group could influence the children's engagement, e.g. staffing levels and personnel change, physical versus seated activity.
Room layout	How classroom equipment such as chairs and computer screens can be best positioned to facilitate the children's engagement.

Name	Description
TRIALLING NEW STRATEGIES	Strategies that adults trialled to meet the aims of the research
Actioning 'optional'	What adults need to do to help children understand that taking part in every research activity is optional
Balancing control with support	How to ensure the children have enough support whilst ensuring they have agency and access to novel experiences
Facilitating peer interactions	What adults need to do to encourage children to interact together
Finishing talk not tasks	The consequences of letting the child talk rather than ensuring they complete the task.
Managing adult anxiety	Thoughts on the potential impact of staff anxiety on children's communication and what to do about it.
More quiet time	Noticing how children respond when adults talk less
Respecting children's communication	Noticing and respecting all modes of communication (including non-verbal behaviours)

APPENDIX O – FRAMEWORK ANALYSIS MATRICIES EXAMPLE

	A	B	C	D	E	F	G	H	I	J
		Actioning 'optional'	More quiet time	Balancing support with control	Respecting child's communication	Finish talk not tasks	Anxiety about behaviour	Peer interactions	Adapting language	
1	AAC teacher Linda	"if I don't bring him back he'll miss out". However, Cai did rejoin the activity repeatedly today in his own time along with frequent breaks outside away from people. He also said 'finished' when he was done. Perhaps this will give us more confidence in giving him a small amount of freedom and respect his non-verbal communication (i.e. moving away when he needs to).		Linda commented that she still finds this difficult and feels "if I don't bring him back he'll miss out".			Staff anxiety about the potential for children to display negative behaviours can mean we avoid topics of discussion. Perhaps even avoiding putting vocab on a communication aid, e.g. book titles.	Linda and Laura discussed how we could create more opportunities for the children to laugh together, rather than with just adults next week. Shaun has a great sense of humour and laugh, perhaps we could use this to everyone's		
2	LSA Moira	Moira noticed that although we said the box activity was optional, Linda guided Cai to sit down in the chair rather than walk around the room. This seems to be a mixed message for him.		Cai built the sentence first in the library on his device then went to the (headteacher's) office with Moira and Linda. Cai went with Moira this time though Moira wondered afterwards if Cai would have gone without her?			There was some anxiety today that Cai may use unwanted behaviour within the activities as he had been doing so a lot over the course of the day. Moira felt this was because he wanted a		Ask the boys to choose a hat for each other. We can model this as adults first, e.g. "Linda choose a hat for Kate" then "Shaun choose a hat for Cai" etc.	
3	LSA Kate	Week 1: The children probably don't understand that it is optional. Nothing is optional, its school. Week 3: Staff seem to be more comfortable in allowing children to leave and rejoin the activities as they wanted to this week. It's getting easier "to go with the flow". However, the children probably don't fully understand that it is optional, i.e. "adults are getting better at giving the option even if the children don't fully get it" "although he (Shaun) wasn't sitting, it felt like he was engaged, he had a licence to be daft!" Shaun does not understand the word 'optional' but has noticed nobody brings him back to his seat	Week 5: There was less talking 'for the children' this week as we were focusing on giving more quiet time for them to answer. Kate didn't know he (Shaun) knew the word 'hide'. He can show more understanding when he has the space to do so.		Kate organised four symbol options on his PECS book: library, music, trampoline or touch therapy. He chose music. This may be because he is meant to be in music at this time (usual routine) and is opting out of the project.	Week 3: Giving a choice is ok if that is the desired outcome of the activity, e.g. the point is 'to give children a choice'. However, this would not work if the task itself needs to be completed which is often the case at school. Perhaps there is a place for both. Week 5: If you had carried on he would				
4										

APPENDIX P – IN VIVO METAPHORS AND RELATED CODES

Metaphor (in vivo)	Reference	Related codes
“screens can be like crack cocaine for kids”	Moira LSA, Session 2	Conflicting rules; response to research activities; troubleshooting technology; prior events; balancing control with support
“he can be like a bull in a china shop”	Kate LSA, Session 1	Modifying session structure; Hi-tech AAC system; respecting children’s communication
“it’s getting easier to go with the flow”	Kate LSA, Session 3	Managing adult anxiety; balancing control with support; actioning ‘optional’; pre-existing relationships; prior events
“he had a licence to be daft”	Kate LSA, Session 5	Respecting children’s communication; actioning ‘optional’; response to research activities

APPENDIX Q – NVIVO 12 INITIAL THEMATIC NETWORKS CODEBOOK

Code	Description
AAC and behaviour	Adult participant perceptions of how using AAC impacts the child participant's behaviour
AAC and its users are changing	The adult participants wider perceptions of AAC and its development and the impact that has on staff roles.
Activities of little value	Child and adult participant perceptions of which activities were not enjoyable or useful.
Debrief on an incident	This code captures that in school life staff reflection is typically for negative 'incidents' relating to children's behaviour rather than for successes or examples of positive working.
Difficulty maintaining continuity	Adult participants view's on conducting the group over six weeks and how unexpected events can impact on the continuity of the group's activities.
Expectations of the children	The adult participant's expectations of the child participants and whether anything happened that they did not expect or was surprising.
Experience of AAC	Adult participant's previous experience of working with children who use AAC.
Exploring with other children	Adult participant views on what other children could benefit from a more child-led approach.
Genuine listening	What adult participant's felt they needed to do within the group and how they managed this.
Getting the staff completely on board	The importance of having participating staff on board with the ethos and difficulties that arise if this does not happen.
Happy on your guidance	The need for relaxed and positive leadership in order to be ok with stepping back
Include the class teacher	Adult participant's view that in the future, including the classroom teacher in the approach would assist carry over of the strategies and enable LSAs to do the same.
It will enable him	The participant's perceptions of hi-tech AAC and what it can offer Cai now, and in the future.
It won't work for all children	Views on what types of children may not benefit from taking part in the AACtion Heroes approach
It's a bit old school	Adult perceptions of the traditional school structure and associated expectations of the children.
Learning for teachers	Adult participants viewed the approach as different to typical teaching approaches and therefore a potentially beneficial learning experience for teaching staff.

Code	Description
Learning to step back	The need for participating adults to stop pre-empting and controlling what may happen and allow children to lead. This may be particularly different and difficult for adults working in a special education context where there is emphasis on protection as well as learning.
Less talking, less demands and more time.	A key message for adults who interact with children who rely on AAC that was taken from participating in the research project
No-one has asked what they think	Adult perceptions of asking children what they think and exploring their opinions in more depth.
Preferred partnerships	Adult and child participant consideration of who they prefer to work with and the impact of different adult/child dyads on communication.
Quick decisions for better results	The idea that reflection and ultimately changing activities week to week ensures the children's needs are met quickly (not waiting a half term to see how it goes).
Responding to a child's right to say no	Adult participant views on the impact of Kojo not wanting to take part and how that was responded to.
Technology and the modern world	Adult perceptions of wider use of technology (aside from AAC) and the impact on the children's communication and behaviour.
Time to think	Structured time for reflection was viewed positively by all adult participants both in terms of participating in the project and its potential for future practice in the classroom.
Useful or enjoyable activities	Activities and related resources that both adults and the child participant perceived positively.
Value of group working	The participants' perceptions of working in a small group of children and adults.
You've got to give them time	Giving more time in interactions mediated through AAC was frequently raised as a learning point by the adult participants.

APPENDIX R – EXPLORATION OF BASIC THEMES EXAMPLE

6	A	B	C
	Codes	Definition	Thoughts
7	Debrief on an incident	This code captures that in school life staff reflection is typically for negative 'incidents' relating to children's behaviour rather than for successes or examples of positive working.	This relates to the concept of reflection and when this might typically be used in the special school setting. This is heavily related to children's negative behaviour. See ABC related to 'applied behaviour analysis' and Skinner's operant conditioning. This is widely used in special education and the only experience of reflection for support staff. Reflection is on negative behaviour, so reflection on communication is only ever to counteract the negative.
8	Difficulty maintaining continuity	Adult participants view's on conducting the group over six weeks and how unexpected events can impact on the continuity of the group's activities.	Continuity is influenced by time of year and the school terms themselves though some issues around continuity such as illness etc are unavoidable. This was also brought up in the pilot study. The impression is that there maybe more absence etc in a special school compared to mainstream. Is this related to wider issues of enjoying life while you can? Acceptance that ill health can come with additional needs? External appointments etc are part of the course? 'School' itself may be positioned differently in the lives of children with complex needs. Pilot study one child was rarely in and this was just accepted as the nature of the families attitude towards school and the level of importance that had in their lives.
9	Expectations of the children	The adult participant's expectations of the child participants and whether anything happened that they did not expect or was surprising.	This is a lovely code in terms of contrasting the participants views on what the children could do and what they actually achieved. 'Ability' itself is a subjectively constructed. Also the idea of 'knowing' and whether this is fixed or flexible concept. Some people are willing to have their expectations changed whereas others are not. Moira's expectations of Cai are high but low of Shaun and Kojo whereas I felt Shaun did very well in terms of expressing his opinions. Linda 'expects' speed because of physical ability but is willing to concede that she has not seen the invisible language processing difficulties that are taking place. Not sure if this element would be better dicussed under 'changing nature and needs of AAC users'.
10	Experience of AAC	Adult participant's previous experience of working with children who use AAC.	None of the staff (even the specialist AAC) teacher had any formal training in AAC. All training had been given by reps from companies when a child received or was looking for a device, e.g. Dynovox. Interestingly, Kate commented that most of the LSA staff in the school have had PECS training. This is widely used with children with ASD and is training fro establishing low-tech symbol exchange communication system. Notably, the system is primarily aimed at requesting. Though it does move on to commenting most children use PECS for requesting various items of interest. Does this wide spread experience of training influence LSAs perception of hi-tech AAC. Do they find it easier to think about and create opportunities for using an AAC voice in these situations? As a result of taking part in this approach Kate commented that they are beginning to think more about what he can say in circle-time. This is typically more social in nature and would be about feelings, opinions? rather than requesting items. AAction Heroes approach is not, currently, proposed as staff trainign experience, but perhaps it would be beneficial to think about it in terms of moving beyond requesting (or sideways) "theres
	Exploring	Adult participant views on what other	Code needs a new name. This is very interesting as participants are in some disagreement about who the approach may be suited for. Kate defines it in