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Enhancing Augmentative and Alternative Communication Engagement
through Dual Language Learning Strategies
and Home-School Collaboration

A thesis presented in partial fulfilment of the requirements of the degree of
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Abstract

Many children who use Augmentative and Alternative Communication (AAC) are dual language learners who require a sociocultural approach to intervention. The sociocultural approach focuses on the importance of integrating first language (L1) vocabulary into AAC systems so that children can participate in all language contexts. Service delivery that occurs in natural contexts supported by a collaborative and culturally responsive team is essential. To date, few studies have been reported in which AAC teams have made provision to meet dual language needs. The current study used a case study approach to explore the effects of home-school collaboration on provision of dual language intervention for a child who uses AAC. The study occurred in a New Zealand primary school context, where approximately 80% of students are dual language learners. The research used an Inquiry approach following the stages of Assess, Plan, Act, and Reflect. Target L1 vocabulary identified by the child's father was programmed into the child's AAC system. Data was collected through interviews, observations, case notes, video recordings, and school documentation. Thematic analysis identified effects on the child's communication clarity in using L1 vocabulary, and increased engagement with peers. For the collaborative team, themes included increased AAC implementation across settings, and growth in shared understanding. Findings support the strong recommendation in the literature of working collaboratively with parents to integrate L1 in AAC systems.

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Augmentative and Alternative Communication Conventions

The following conventions are used when transcribing communication which occurred during the research project. These are aligned with conventions utilised in Augmentative and Alternative Communication, the Journal of the International Society for Augmentative and Alternative Communication (ISAAC).

- Natural speech is italicised: *I like the playground.*
- Aided language using synthesised speech is transcribed in italics with quotation marks: *"I like playground"*.
- Interpretations of gestures or movements with communicative intent are recorded using single quotation marks: 'yes' (nodding).
- Combinations of any aided or unaided communication with natural speech are recorded in curly brackets: {HAPPY *I am happy*}.
- Signs are recorded with capital letters: HAPPY.

Chapter 1: Introduction
Enhancing Augmentative and Alternative Communication Engagement
through Dual Language Learning Strategies
and Home-School Collaboration

The need for research regarding dual language engagement with Augmentative and Alternative Communication has been expressed in the literature. The current study took place to contribute to the current need. A case study design was used to evaluate the effectiveness of a collaborative intervention in the contexts within which communication occurs. Collaborative inquiry framed the intervention, as this approach is well supported by current literature and was already utilised within the school setting. The following chapter introduces the key elements which relate to the investigation.

Augmentative and Alternative Communication (AAC)

AAC is the umbrella term for any tool that is used in place of or as a support for speech (Kent-Walsh, Binger, & Malani, 2010). AAC may include unaided approaches which use body movement, such as gestures, signs, or facial expression, and aided system which use external materials to augment or enable communication. Aided modalities can include low-tech options, such as communication boards or books, and battery-operated switches programmed with words or sentences. Aided AAC systems can also be high-tech and use voice-output, such as Dynavox and NovaChat devices or iPads with communication apps (such as TouchChat or Proloquo2go).

People who use AAC encompass individuals of all ages, backgrounds, and cultures (Kent-Walsh, Binger, & Malani, 2010). When individuals are not able to rely solely on speech to communicate and use AAC, they are described as having complex communication needs (CCN). For some children and adults with CCN their speech is not consistently clear, and there is a need for augmented support to clarify spoken messages. Other individuals with CCN may use sounds or body movements that have meaning for familiar communication partners and are unclear for unfamiliar listeners. This range of communication difficulties can be experienced by individuals with cerebral palsy, dyspraxia, autism spectrum disorder, intellectual disability, and Down syndrome, along with many other conditions (Beukelman & Light, 2020).

Beukelman and Light (2020) clearly state that there are no prerequisite skills that need to be demonstrated before introducing AAC. All that is required is for the individual to be “unable to meet all communication needs via natural speech” (p. 19). It is the right of any individual who requires AAC to have access to a means to communicate. For individuals who use AAC, provision of support to learn an AAC system and continue to extend their communication is as important as creating opportunities to participate meaningfully. Parents and other significant others also need to be supported to build their skills to communicate using AAC and to facilitate communication (Beukelman & Light, 2020).

Collaborative Teams

Collaborative practice is recognised as essential in provision of therapy services to children within the New Zealand context (Ministry of Education, 2019b) and internationally (Watts Pappas et al., 2009; White & Spencer, 2018). Within collaborative teams, the contributions of each person in the team is valued equally and priority is given to understanding and respecting each other’s perspectives (Ministry of Education, 2019b). It is important that teams form shared understanding of concepts and approaches discussed. When professionals and family members are from culturally and linguistically diverse (CLD) backgrounds, defining and explaining terms and constructs is particularly crucial (Macfarlane, 2015).

In collaborative AAC teams, clear priorities are set, plans of action decided and responsibilities of team members allocated (Hunt et al, 2002). For children who use AAC, the collaborative team includes the child’s parents and significant communication partners, such as teachers and learning assistants (LAs). Collaboration by team members supports understanding of shared knowledge of a child’s skills and communication needs (Beukelman & Light, 2020). Gaining understanding of parent priorities is important so that goals are meaningful to the child in everyday contexts (Bailey, 2006; Beukelman & Light, 2020). Support by professionals includes AAC skill building to increase the effectiveness of engagement with AAC systems (Kent-Walsh, Murza, Malani & Binger, 2015).

Within the New Zealand education context, an Inquiry framework is used by collaborative teams (Ministry of Education, 2019b; Timperley et al., 2014). This framework guides teams to identify a child’s learning needs, formulate an intervention plan together, implement the plan, and review the effectiveness of what took place. Therapy services evaluate effectiveness within this same framework (Ministry of Education, 2015). An Inquiry

approach guides conversations and interventions towards shared focus areas to maximise effectiveness for children receiving services. Inquiry fits well with the assessment, intervention, and evaluation practices recommended in the field of AAC (Beukelman & Light, 2020).

Developing Culturally Responsive AAC Intervention for Dual Language Learners

Dual Language Learners are children who are learning more than one language either simultaneously or sequentially (Paradis et al., 2003). As stated, within current AAC research there have been very few published studies regarding engagement of children who are dual language learners engaging with AAC (Yu, 2018). Language development itself is a complex phenomenon, and many children with CCN have the added challenge of learning two languages. For children with complex communication needs, their first language (L1) is not an established language when a second language (L2) is introduced. At school they may also be provided with the additional 'language' of an AAC system.

Knowledge of the way dual language learners typically acquire language is important to consider when working with learners who use AAC. This will be discussed further in the following chapters.

Researcher and SLT

The researcher has worked with children with CCN for the past 13 years. During this time a key focus of professional learning has been how to develop children's communication skills. This learning has included growing knowledge of AAC and sharing this with team members and families. Many children, families and staff members are bilingual communicators, and this provides an additional element to increasing AAC skills. The research discussed in the following chapters arose from the SLT-researcher's own practice and awareness of the need to engage in culturally responsive AAC practice for children and families.

Research Aims

The aim of the current study was to contribute to the literature regarding how to increase meaningful participation in all language contexts for children who are dual language learners and use AAC. Enhancing engagement with AAC is the objective of professionals who support children to use these systems. This is not a solitary pursuit and occurs in the context of a collaborative team, with each person bring varying perspectives and priorities. The outcome evaluated throughout the study was enhanced engagement

with AAC. This outcome is intentionally broad to allow for any observable changes in children, their communication partners, and the child's team. The research question investigated was:

What are the outcomes of an intervention that consists of collaborative planning and dual language focus for a student who uses AAC?

Structure of the thesis

The introductory chapter outlined the concepts foundational to the current study. This included a brief explanation of who uses AAC and why (Beukelman & Light, 2020). The need for collaboration within AAC teams was also introduced (Hunt et al., 2002) along with a brief rationale for investigating how to meet the AAC needs of children who are dual language learners (Solomon Rice et al., 2018). Chapter two provides an overview of the literature related to AAC, collaboration, and dual language learning. The chapter concludes with discussion of the intersection of these areas with commentary from the literature. Chapter three provides information regarding the methodology for the study, including ethical considerations. The framework for the collaborative assessment, planning, intervention, and evaluation are outlined in the methodology chapter. This is followed by detailed information regarding the results in chapter four, and discussion of the findings and relevance to the literature in chapter five. The thesis concludes by addressing the strengths and limitations of the study, and the implications for practice.

Chapter 2: Literature Review

This chapter begins with an overview of communicative competence for those who use AAC. This section includes an introduction to the linguistic, operational, social, strategic, and psychosocial skills required for effective use. The importance of assessment and intervention being embedded in natural contexts is discussed, along with the need to build skills for adult communication partners. Evidence for the effectiveness of communication partner interventions is presented together with the barriers and facilitators of successful AAC interventions.

The rationale is then given for collaborative interventions between SLTs, educators, and families. Reference is made to collaborative frameworks which guide teams in working effectively together, such as He Pikorua (Ministry of Education, 2019b) and Inquiry processes (Timperley et al., 2014). The values of Manaakitanga (valuing others), Whanaungatanga (belonging), and Rangatiratanga (knowing self) are explained, as important qualities for team members to embrace. Collaborative teams formed around children who use AAC are child-centred and family-focused, and this is discussed in the context of families from CLD backgrounds. The collaboration literature concludes with introduction to the team members for children using AAC, and their roles.

Review of the literature continues with explanation of what it means to be a dual language learner. Discussion of the processes related to dual language acquisition are provided, along with explanation of key terms used in this field. Code switching is described, and language dominance and use described. This is followed by a review of the literature regarding children who are dual language learners and have L1 needs. The relevance of this literature to children who use AAC is then discussed. Considerations regarding the language used on AAC systems, perspectives of parents from CLD backgrounds, and integration of L1 are then addressed.

Communicative Competence in AAC

Having access to a robust AAC system is critical for children who are unable to use speech as their primary mode of communication. Being able to use AAC systems functionally requires the development of many skills. Light (1989) expresses that communicative competence is required for meaningful communication in day-to-day interaction. The competencies required for AAC use span social, strategic, linguistic, operational, and psychosocial domains (Light & McNaughton, 2014). Evaluating an individual's skills and

needs within these domains is useful in guiding intervention priorities for AAC teams (Light & McNaughton, 2014).

Linguistic Skills

To engage effectively with AAC systems, children require understanding of the systems they use. From a linguistic perspective, the tools are the language code(s) through which we make meaning of spoken and/or written communication (Light & McNaughton, 2014). Many children function within environments using more than one language code and need to learn the linguistic skills for each context to communicate functionally. Building knowledge of how to use these languages in the correct environments, and to move between these languages (code switching) is essential for dual language learners (Baker, 2017). For children who are unable to use spoken language effectively in these language environments, understanding and using AAC systems also requires developing knowledge of the language codes of their AAC system (Soto & Yu, 2014).

Operational Skills

Children need to learn operational skills that enable them to use AAC systems in the most accessible way for them. This may mean navigating and selecting symbols using their bodies, hands, eyes, feet, or whatever access method is most effective to the individual (Beukelman & Light, 2020).

Social Skills

Being able to use an AAC system to select symbols (operational skills) and construct a clear message (linguistic skills) is of little benefit without the awareness of social context – communicating with another person for a meaningful purpose (social skills). Within the social domain, important skills include taking conversational turns, staying on topic, and using communication for a range of functions, such as sharing and asking for information, and ending a conversation (Light & McNaughton, 2014). Sociorelational skills are essential for children who use AAC, as these include awareness of the communication partner and their needs (Beukelman & Light, 2020).

Strategic Skills

To use AAC systems during interactions, children (and adults) also require strategic skills. These may provide a means of overcoming limitations of the AAC system, related to the slow rate of communication, or vocabulary that is not programme. Using pre-recorded messages for specific contexts and purposes can be used to address these needs

(Beukelman & Light, 2020). Examples of strategic messages may include an introduction of the AAC system for unfamiliar communication partners, or pre-stored phrases to end an interaction, e.g. 'I need to go now', or 'I don't have the words here. Please ask me yes/no questions'. Strategic AAC skills are also demonstrated through flexibility with the vocabulary available. This is demonstrated when a child uses an associated word, when the specific word they want is not on the AAC system.

Psychosocial Factors

In addition to the skills in the above domains, psychosocial skills contribute to the effectiveness of AAC use. Light (2003) identified that attitude, confidence, motivation, and resilience all influence engagement. As can be seen across the domains, using AAC to communicate with others is demanding. Persevering with communication in the face of these demands, requires motivation by those who use AAC as well as communication partners. Attitude, confidence, and resilience are all factors which impact the likelihood of children, families, and daily communication partners gaining AAC skills.

Embedded AAC

The literature clearly states that competence is best assessed in the context in which communication occurs (Beukelman & Light, 2020). Similarly, focus of intervention with AAC is in natural contexts with daily communication partners (Goosens, 1989; Kent-Walsh, Binger, & Malani, 2010; Ronski et al., 2006). As with building a child's communicative competence, adults require support to build AAC skills and confidence (Kent-Walsh, Murza, Malani & Binger, 2015). Organisational change is often required to increase focus on building child and adult competence with AAC (Beukelman & Light, 2020). Success of AAC engagement is influenced by management support (Beukelman & Light, 2020; Kent-Walsh, Murza, Malani & Binger, 2015), shifts in communication partner competence (Bingham et al., 2007; Bruno & Trembath, 2006; Garrison-Harrell et al., 1997), and collaboration to address the common barriers in using AAC (Bailey, 2006; Baxter et al., 2012).

Assessing Skills and Needs in Natural Contexts

Beukelman and Light (2020) highlight that it is important to identify communication needs for the present and needs for the future with children and families. Assessment of the current skills of the child is needed and knowledge of what skills are required to participate effectively (Beukelman & Light, 2020). The AAC team need to know who the child communicates with, what languages are used, and the modes they use in those interactions.

Evaluation of supports and barriers present in the child's environment includes identifying the capacity, skills, and support needs of communication partners (Beukelman & Light, 2020). Assessment can occur through conversations with these key stakeholders, as well as observations of interaction in everyday contexts. In situations where a family's L1 is different to the AAC team members, provision of appropriate interpreting supports is essential (Mindel & John, 2018). Further assessment can be carried out to provide more information about specific language skills using formal or criterion-referenced assessments (Beukelman & Light, 2020).

Intervention in Natural Contexts

AAC users need to learn to associate symbols with spoken words (Beukelman & Light, 2020; Ronski & Sevcik, 1996). As with learning any new language, AAC research points to the importance of natural communication settings as the focus of intervention for families and class teams (Goosens, 1989; Kent-Walsh, Binger, & Malani, 2010; Ronski et al., 2006). To gain proficiency in understanding and using AAC, children need to observe communication partners matching symbols with spoken words in meaningful contexts. Children learn by being immersed in a communication environment where the language and system they are learning is used consistently by communication partners (Goosens, 1989; Kent-Walsh, Binger, & Malani, 2010; Ronski et al., 2006). As children see symbols modelled on AAC systems, studies have shown that they are able to learn to link symbols with the spoken words in their receptive vocabulary (Drager et al., 2006; Ronski & Sevcik, 1996) as well as build competence in using these symbols to communicate (Binger et al., 2010; Bingham et al., 2007; Ronski et al., 2006).

Building AAC Awareness

Policies and practices that mandate inclusion are important to increasing awareness of AAC and access to AAC systems (Beukelman & Light, 2020). Organisations that allocate time and resources to training of staff to understand the rights of children to communicate and strategies for implementation of AAC are essential advocates for children with CCN (Kent-Walsh, Murza, Malani & Binger, 2015). With systemic change the goal of organisations and schools is to create communities where AAC systems are used by everyone in the environment, rather than the child alone (Beukelman & Light, 2020). Many organisations and individuals bring AAC use to the forefront through the media where people who use

AAC share their stories, and through events such as the ISAAC International Awareness Month (International Society for Augmentative and Alternative Communication).

Building AAC Competence & Confidence in Communication Partners

Just as children require support to build communicative competence skills for AAC use, adults require support to learn AAC systems and interaction strategies. Without this input, Kent-Walsh et al. (2010) state that it is common for adults to provide minimal opportunities for AAC users to participate in conversation. Adults tend to dominate the talking, interrupt students using AAC, and ask closed rather than open questions. Adults can also become distracted with the AAC system, rather than remaining present and focused on the communication (Kent-Walsh et al., 2010).

Review of the AAC literature highlights the impact of building communication partner skills to develop competence and confidence (Kent-Walsh, Murza, Malani & Binger, 2015). Kent-Walsh, Murza, Malani & Binger (2015) identified the following training components within the literature: providing rationale and benefits of strategies with step-by-step instruction, modelling skills and strategies, rehearsing steps of strategy, providing opportunities for guided practice (with reducing cues by instructor), carrying out role play with instructor, and using written or online materials. In most cases, training of adults included a combination of these approaches.

Effectiveness of Communication Partner Interventions

Many studies have shown that changing the way adults engage with AAC systems can result in children learning social communication skills (Bingham et al., 2007; Bruno & Trembath, 2006; Garrison-Harrell et al., 1997). Training educational assistants in using AAC systems has been found to decrease challenging behaviour in students (Bingham et al., 2007; Garrison-Harrell et al., 1997). Involvement with peers in training using systems and social skills programmes have also been found to make a difference in social behaviour and increase use of AAC systems by children (Garrison-Harrell et al., 1997).

A review by Kent-Walsh, Murza, Malani & Binger (2015) also highlighted the significant positive effects on intervention targeting linguistic elements using AAC, such as semantics and syntax. Examples of positive outcomes for children include increase in multi-symbol production (Binger et al., 2010), increased use of morphology (Solomon Rice et al., 2017), and increased use of specific question forms (Kent-Walsh, Binger & Buchanan, 2015).

Kent-Walsh, Murza, Malani & Binger (2015) note that studies reporting positive linguistic outcomes included communication partner instruction.

Factors Affecting Engagement and Success with AAC

As with any intervention, there are many factors that influence engagement with AAC. In their review, Baxter et al. (2009) found that providing training and having support of parents were two factors that facilitated engagement with AAC. Parents in Bailey's (2006) study also identified facilitators such as how straightforward the AAC system was to use, and how well the team worked together to support use. The team dynamics included team members being viewed as equal; effective collaboration of the team; and professionals meeting training needs (Bailey, 2006). Positive outcomes of AAC use were observed by family members including greater communicative competence of their child, along with increased independence (Bailey, 2006).

While AAC can transform the communication of those who use it, there are many potential barriers to be aware of. Abandonment of AAC systems is common (Beukelman & Light, 2020). Family members and professionals who work with children with CCN do not always see the need for AAC support, stating that they understand the child already (Adler, 2017). Contributing to this is the reality that children do not consistently receive adequate AAC services (Beukelman & Light, 2020; Kent-Walsh, Murza, Malani & Binger, 2015). Kent-Walsh, Murza, Malani & Binger (2015) also note in their review that not having time allocated for training is a significant and repeated barrier to effective use.

An ongoing challenge for professionals and parents is finding adequate time for important planning conversations to take place (Baxter et al., 2009; Baxter et al., 2012; Watts Pappas et al., 2009). Moorcroft, Scarinci & Meyer (2020) interviewed parents and found that the barriers experienced by them included lack of communication between professionals, and limitations in professional support to use AAC. Forming supportive AAC teams is essential to addressing the needs of children who use AAC (Beukelman & Light, 2020; Kent-Walsh, Murza, Malani & Binger, 2015). Factors related to developing effective collaborative practice will be explored in the following paragraphs.

Developing Effective Collaborative Teams

Collaboration is now recognised as essential to providing effective speech language therapy services (White & Spencer, 2018). Traditional speech language therapy in schools operated on a one-to-one basis, with children being seen in a clinic or withdrawal space for

direct therapy. While changes in target skills can be observed in this approach to practice, the need for more holistic approaches has been identified by professionals and parents alike (Watts Pappas et al., 2009). Drivers of change include the concept of inclusion in special education, the importance of parents and teachers as key partners in the process of skill development, and an understanding of the influence of broader ecological factors on children (Hartas, 2004).

When forming collaborative relationships in the presence of diversity, it becomes important to consider how to establish shared understandings. Macfarlane (2015) suggests that it is important to evaluate what different concepts may mean to team members, and how information can be interpreted based on varying cultural perspectives. These are crucial considerations in professional practice, when engaging with families from cultures different to our own who have children with learning support needs (Brassart et al., 2016; Macfarlane, 2015).

Collaborative Frameworks and Processes

Within the New Zealand context, collaborative practice is guided by the Ministry of Education framework of He Pikorua (Ministry of Education, 2019b). Within this framework, children and families are central and equal partners, and professionals are linked together to support their unique needs. He Pikorua is aligned with the Treaty of Waitangi (Te Tiriti o Waitangi) which is the founding document of New Zealand. This framework is strongly linked to the Treaty principles of partnership (working together), protection (of children as our taonga-treasure), and participation (by all those involved with the child). He Pikorua embraces Mahi Tahī (translation 'one work') in which the collaborative partners focus together on specific goals (Ministry of Education, 2019b).

Collaborative service delivery is a distinct way of establishing and working with a team, where all involved are equal partners, whose voices are heard and valued (Macfarlane, 2015; Ministry of Education, 2019b). This is distinct from approaches focused on an 'expert' or 'specialist' providing intervention, or consultation and training. Within collaborative teams, a transdisciplinary approach is embraced, which values gathering information across team members, and requires development of a cohesive plan together, across settings and disciplines (Ministry of Education, 2019b).

Inquiry. Within New Zealand schools, an Inquiry approach is a collaborative process used to identify needs of target students, implement strategies to influence learning, and

monitor effectiveness through outcomes (ERO, 2016; Timperley, Kaser & Halbert, 2014). He Pikorua (Ministry of Education, 2019b) resources provide the following clear framework as a guide to establishing the purposes of collaborative relationships and identifying priorities for intervention: (a) What is the need or purpose? (b) What outcomes are desired? (c) What strategies or approaches have been successful? (d) What else could be explored? (e) Identify resources and next steps together (Ministry of Education, 2019b).

For therapists working in school settings, the same cycle of improvement is also used to monitor effectiveness of services for ORS funded students (Ministry of Education, 2015). Services are coordinated to meet the needs of the child and family. While the child with communication challenges is at the centre of collaboration, Klatte and colleagues suggest that outcomes of intervention may also be identified for parents and professionals (Klatte et al., 2020). Examples of this may be parents' growth in understanding their child's communication needs, the child increasing in a specific communication skill, and the professional's improved collaboration with families. Klatte suggests that collaboration in this realist approach is focused on what teams want to achieve, who outcomes are targeted towards, in which context, and to what degree change is expected (Klatte et al., 2020).

Qualities of Collaborative Teams

Collaborative skills are important for team members to develop as sharing information and forming plans together strengthens commitment to following through on what has been agreed. Collaborative practice benefits from focus on two strands – the relationship and how this is formed, and the common purpose that brings team members together (Klatte, 2020). Within healthy professional partnerships, individuals recognise the strengths that each one brings to the conversation. Developing respectful relationships with teachers and parents is essential to understanding the unique strengths and needs of children, and of those who care for them. The values within Maori culture of manaakitanga, whanaungatanga and rangatiratanga are key to forming meaningful and effective relationships between families and professionals (Macfarlane, 2015).

Manaakitanga – Valuing Others. Manaakitanga is an important value for collaborative practice and is experienced through showing value for others, along with care and generosity towards them (Macfarlane, 2015). The essence of Manaakitanga is to hold others up and valuing the diversity and strengths each brings to the group. The unique knowledge and contribution of the other is prized - the child, their family and the

professional staff surrounding the child (Macfarlane, 2015). In practical terms this may be established by allowing time in meetings for each person's voice to be heard and engaging in active listening (Beukelman & Light, 2020). Reflective questioning can be used to seek further information, to gain clarity about priorities and perspectives of team members and request feedback from team members (Ministry of Education, 2019b).

Whanaungatanga – Belonging. Whanaungatanga is a concept which is centred on family relationships and the togetherness that these bring, but also extends to a sense of belonging, shared focus and experiences within communities (Moorfield, 2021). Macfarlane (2015) expresses that this kind of relationship building integrates awareness of establishing trust between professionals and families, awareness of spiritual aspects that are important to family, and focus on maintaining relationship across time. Parents are integral partners in the teaching-learner relationships and identifying ways that they can feel a sense of whanaungatanga within the school community is important (Ministry of Education, 2019b). Alongside respecting and connecting with families, recognising the knowledge and strengths of the child at the centre of the relationship is key (Macfarlane, 2015).

Rangatiratanga – Knowing Self. Rangatiratanga encapsulates the awareness of self and of what one brings to the collaborative relationship – our own perspectives, cultural biases, and underlying assumptions (Macfarlane, 2015). Enhanced understanding of our own values and prejudices is key to practicing with cultural competence (Macfarlane, 2015). Increased growth in awareness of our own values and biases can lead to greater insight and respect when engaging others from culturally and linguistically diverse backgrounds (Macfarlane, 2015).

The Collaborative Team

As already discussed in relation to AAC, the introduction of collaborative service delivery for therapists has ushered in a focus on embedded therapy interventions that are carried out within everyday contexts (Hartas, 2004; Klatte et al., 2020). Benefits for this shift include target skills being identified by family and school staff, and these same key people providing daily opportunities to practice communication skills multiple times across the week. While this approach can result in positive skill development for children, there are also challenges both at home and in the classroom, including time constraints, workload pressures, and conflicting priorities (Hartas, 2004; Klatte et al., 2020). While there are challenges to be faced by collaborative teams, research shows good evidence for partners

being effective in providing AAC intervention at school (teachers, learning assistants, peers) and at home (parents and siblings) (Solomon Rice et al., 2018).

Family-focused Collaboration. In family-centred decision-making, the focus is on parents choosing the way they engage with services, based on their knowledge and capacity and their understanding of intervention available (White & Spencer, 2018). Research has demonstrated the effectiveness of regular practice of skills within interactions at home, such as shared book reading (Kent-Walsh, Binger, & Hasham, 2010). Within these naturally occurring contexts, regular and repeated activities can provide opportunities to practice a skill well beyond the scope of the speech language therapist. Within the home setting, parents have lived experience of understanding and interpreting the communication intent of children with CCN (Kent-Walsh, Binger, & Hasham, 2010). Moorcroft, Scarinci & Meyer (2020) reported factors that influence parent engagement with AAC include capacity to engage, family social supports, and the way professionals listen to and support family priorities and needs. (Moorcroft et al., 2019, 2020). As observed by (White & Spencer, 2018) and (Kent-Walsh, Binger, & Hasham, 2010), ongoing support of parents is important for effective intervention to take place.

Engaging Culturally and Linguistically Diverse Families (CLD). When professionals engage with families who are CLD, consideration needs to be given to establishing a collaborative relationship that is respectful of diversity. Brassart and colleagues (2017) interviewed 21 service providers and gained insight into factors that contribute to engagement with services for CLD families. The priority for families was addressing language needs of children, including identifying shared perspectives with professionals (Brassart et al., 2017). The importance of professionals increasing their understanding of cultural perspectives has been highlighted by people who use AAC and their families (Kulkarni & Parmar, 2017). Further to these factors, engaging in home-based interventions is important to parents, as this is the context in which cultural practices take place (Kulkarni & Parmar, 2017).

Child at the Centre. At the heart of any collaborative team is the child, their interests, strengths, skills, needs, and aspirations (Beukelman & Light, 2020). In their research, Williams et al. (2009) reviewed information presented by people who use AAC, along with perspectives of family members. They identified key principles resulting from this vast body of published work, including that full participation in all aspects of life is the goal

of AAC (Williams et al., 2009). Participating fully requires that many functions of communication are met, including exchange of greetings, sharing information, making social connections, refusing and accepting what has been offered, and giving instructions (Beukelman & Light, 2020). The person who uses AAC needs to have the greatest input into meeting these communication purposes through the AAC system setup. The importance of this is expressed well in the saying 'nothing about me without me' p. 195 (Williams et al., 2009).

Teacher Engagement. In the school context, SLTs can support teachers to gain confidence in using AAC systems and identifying meaningful learning and communication opportunities for children with CCN. Research shows that this happens most effectively when the professional team (teachers, learning assistants, and SLTs) work together to set goals, and to implement strategies in the context of daily communication (White & Spencer, 2018). Teachers were surveyed by Andzickm et al. (2019) regarding their experiences in providing support to children who use AAC. The teachers reported concerns regarding assessment of students, limitations in training, inadequate preparation time, and discrepancies in the way AAC systems are used. The importance of teachers receiving professional learning regarding assessment and implementation of AAC was also highlighted in a review carried out by Chung and Stoner (2016).

Learning Assistant Engagement. Learning assistants are responsible for implementing use of AAC systems into the school day, as they support children to participate in learning (Hunt et al., 2002). Training learning assistants in using AAC systems has been found to decrease challenging behaviour in students (Bingham et al., 2007). There is evidence that training LAs in these communication strategies results in successful implementation of strategies and AAC use (Bingham et al. 2007; Binger et al., 2010).

Therapist Engagement. Within school contexts, there may also be opportunity for SLTs to collaborate with therapists from other disciplines. Sylvester and colleagues (2017) highlight the benefits of working together with physical therapists to enhance service delivery. Similarly, occupational therapists are key collaboration partners within a school context. With understanding of each other's professional contributions, and the frameworks within which service is provided, therapy teams are well positioned to identify shared goals, and how to integrate these within therapy and everyday contexts. Shared recommendations can then be made to families and class teams so that interventions take place within the

context and are streamlined for families (Sylvester et al., 2017). This could include planning regarding positioning of a child's AAC system for easy use during daily time in a standing frame or integrating the system to use across communication and literacy activities.

SLT Involvement and Support. With the shift in delivery to a collaborative model, and away from an 'expert' model, the SLT needs to develop skills required to work collaboratively. This includes an awareness of their own perceptions and biases, and the learning that is required to become a professional who values the voice of the child, the expertise of parents, and the contributions and priorities of team members (Klatte et al., 2020; White & Spencer, 2018). The priority in delivering SLT service is establishing relationship with parents, engaging them to participate within their strengths and building their capacity as communication partners (Beukelman & Light, 2020). In the New Zealand context, it is SLT who is likely to share knowledge regarding AAC and the systems that can be explored as a possible fit for the child and their family. At each step in the pathway from trial to implementation of AAC, the decisions made and support required need to come out of respectful and collaborative conversations (Beukelman & Light, 2020).

Developing Culturally Responsive AAC Intervention for Dual Language Learners

Within current AAC research there have been very few published studies regarding engagement of dual language learners with AAC (Yu, 2018). Language development itself is a complex phenomenon, and many children have the added challenge of learning two languages, often at early childhood or school entry (Baker & Wright, 2017). For children with complex communication needs, their first language (L1) is not an established language when a second language (L2) is introduced. At school they may also be provided with the additional 'language' of an AAC system (Mindel & John, 2018).

Knowledge of the way dual language learners acquire language skills is important to consider when working with learners who use AAC. The following paragraphs explore the literature regarding language acquisition, along with what is known about children with language learning needs.

Dual Language Learners

Children's academic achievements, as well as their emotional health and wellbeing, are connected to ongoing growth in their home language (Cummins, 2000; Paradis et al., 2003). Exposure to two or more languages is never equal, and consideration of the quality, amount, and age of acquisition is important. Dominance of each language is also key to

understanding the experiences of children within majority or minority languages. The following section will define key terms and discuss factors and progressions in children's home language (L1) and second language (L2) development.

While language acquisition is an individual and dynamic process, terms related to the timing and order of language learning are useful to guide understanding. True bilinguals are those who learn two languages from birth, hence the term simultaneous bilinguals (Baker & Wright, 2017; Paradis et al., 2011). Much variability exists in language competence of bilingual individuals, and measurement of comparative skill across domains of speaking, listening, reading, and writing is challenging. Balanced bilinguals have equal competence and comfort in two languages, whereas non-balanced bilinguals have greater skill in one language. When a second language (L2) is learned after three years of age, this is considered sequential bilingualism, or second language learning. Paradis et al. (2003) use the term 'dual language learners' to encompass those who are both simultaneous (L1) and sequential (L2) bilinguals (Baker & Wright, 2017, Paradis et al., 2011). Mixed results and opinions exist in the literature regarding the advantages or disadvantages of acquiring two (or more) languages (Baker & Wright, 2017; Luo et al., 2010; Tao et al., 2015). The advantage of bilingualism includes greater metalinguistic awareness, creative thinking, and larger vocabulary when taken across languages (Baker & Wright, 2017). Variation in these effects exist and are impacted by factors such as whether an individual is a balanced bilingual or not. Disadvantages reported for bilingual individuals include slightly slower word retrieval, however this is considered minimal in functional language use (Baker & Wright, 2017; (Bialystok, 2009). As investigation continues into the cognitive benefits or challenges of being bilingual, the fact remains that this reality is intertwined with everyday life for many children.

For all dual language learners, the prevalence of the languages being acquired influences what is learned and in which context (Paradis et al, 2011). A majority language is one in which most members of society interact, media channels are conveyed, national and regional leaders communicate, and education settings operate. Conversely, minority languages are spoken in homes, family groups, or community gatherings of minority cultural groups. While the distinctions are not always clearly defined, they do impact the language experience of children, as they move between home, community, and educational settings. Paradis, Genesee & Crago (2011) differentiate between four possible scenarios:

1. Children from a majority culture who are developing two majority languages before three years of age.
2. Children from a minority culture who are developing two languages before three years of age, one language may be a majority language.
3. Children from a majority or minority culture who are learning a second language after three years of age.
4. Children from a minority culture who are learning a second language, usually for the purposes of participating in education in the majority language.

Considering the processes and progressions of second language acquisition is also important in this discussion. As with L1, receptive language understanding is usually greater than the ability to use that language. For school-aged students, Basic Interpersonal Communication Skills (BICS) develop before Cognitive Academic Language Proficiency (CALP). CALP skills include the ability to use language to talk about learning, as well as the ability to read and write in that language (Cummins, 1999; Ministry of Education, 2008). The stages of L2 acquisition are similar to learning L1. Following are the stages of expressive language development for L2 acquisition (Mindel & John, 2018):

1. silent period, absorbing the new language,
2. using memorised chunks of L2,
3. emergence of simple phrases in L2, with grammatical errors,
4. increasingly consistent use of L2 in functional ways, with increased accuracy in grammatical constructs, and pronunciation (English Language Learning Progressions Introduction, Ministry of Education, 2008).

The ability to use a new language to converse may take approximately two years, whereas the ability to use that language to learn and participate in schooling (CALP) can extend to seven years or more (Baker & Wright, 2017). Many factors influence the timeframe to acquisition including language skill in L1, the timing of learning L2, and the instruction given. When a child understands learning concepts in L1, this provides powerful connections to support CALP in L2. Explicit teaching of vocabulary and language structures is known to be effective. As with all learners, evaluation of current skills is important to give instruction at the appropriate level. Within New Zealand schools, English Language Learning Progressions (Ministry of Education, 2008) are used for this purpose, which involves observation of children in a range of learning and social interactions. Gathering information

may include recording the words or sentences students' use, non-verbal communication, instructions they can follow, and digital recording of speech (Ministry of Education, 2008).

Code Switching

Children who are dual language learners alternate between languages, either intentionally or unintentionally. Children are likely to engage in this with peers at school who share the same L1 during casual conversation. Code switching may involve lexical or grammatical aspects of language and can occur within or across utterances (Baker & Wright, 2017). Bilingual adults will follow grammatical rules for each language, even when they change languages within an utterance. They use code switching to provide vocabulary across languages. Adults learning a second language do not follow this pattern but may impose the grammatical structure of L1 until competence is established in L2. With lexical gaps, they are likely to stop and ask for help with a word, rather than substitute from L1. Bilingual children, at around two years of age, show awareness of using the language of their communication partner (Baker & Wright, 2017). At around four years of age, children consistently use the language that is most appropriate for the setting and are unlikely to switch between languages during conversation. Pre-school children tend to mix language features more when they are using their non-dominant language. Code switching occurs within social contexts, and family and community members establish expectations and patterns for this practice (Baker & Wright, 2017).

Language Dominance and Use

Bilingual parents sometimes make conscious choices about the language they will use with children to facilitate bilingual acquisition by children. Parents may adopt a 'family language policy' of sorts, where parent or grandparents speak different languages with their children (Yu, 2018). These decisions are made to enable children to communicate within the different language contexts of the family and wider community. One parent may speak the home language (L1) of the family to promote language acquisition in L1. The other parent may speak the majority language of the community to prepare children to communicate beyond home and provide a foundation for learning the academic language of school (Yu, 2018).

Alongside parent preference, the impact of child agency on dual language children is an important aspect of language use that has been emerging in the literature (Fogle & King, 2013). At school entry, language dominance of dual language learners may shift from L1 to

L2. Requirements of the learning environment, and the dominant language of peers, may influence the extent to which L1 and L2 are used across settings (Kay-Raining Bird et al., 2005). These changes can result in language loss by children, including responding in L2 when spoken to in L1.

The Ministry of Education four-year plan for 2016-2020 (Ministry of Education, 2019a) highlights the importance of respecting cultural and linguist diversity within Aotearoa New Zealand. Policies which promote dual language use can impact students' language choices within schools and classrooms where home languages of children (L1) are valued and promoted (Baker & Wright, 2017). Using home languages to discuss learning in the classroom context is an important aspect of this (Baker & Wright, 2017).

Dual Language Children with L1 Language Needs

Among the population of dual language learners are children with language disorders who have significant challenges with understanding and using language. These children may find it difficult to learn or recall vocabulary, as well as to understand and use complex sentences including grammatical aspects such as verb tense, plurality, and word order rules. Children who present with these profiles may have a developmental language disorder (DLD) in which no other known condition exists, or have a diagnosed condition, such as cerebral palsy (CP), autism spectrum disorder (ASD) or Down syndrome (DS). Some of these children may have little or no functional speech and have complex communication needs (CCN). Meeting the language learning needs of children with CCN in bilingual communities requires specific consideration. Weighing the learning demands with the need to participate in a range of language contexts has led researchers to consider the impact of CCN on simultaneous and sequential language learning.

When multiple languages are used within the home and the community, this necessitates some functional use of these languages by children with CCN. Kay-Raining Bird et al. (2012) surveyed 49 parents of children with ASD regarding language choice. Most parents chose to raise their children with bilingual language exposure, due to the current and future need to be able to function within each language context. Many parents used a strategy of one parent speaking each language to their children (Kay-Raining Bird et al., 2012). In most cases they considered bilingualism as equally or more important for their children with ASD as for children without ASD, and many of these parents reported that they were having some success in helping their child learn both languages.

In addition to this evidence, studies have also shown that children with ASD are not disadvantaged when parents raise them in a bilingual way. Monolingual and bilingual children with ASD present similar skill levels in both language and social communication measures (Hambly et al., 2013; Ohashi et al., 2012; Petersen et al., 2012; Reetzke et al., 2015; Valicenti-McDermott et al., 2019). Hambly and Fombonne (2013) reported no significant difference in language scores for children with ASD who were bilingual (simultaneous and sequential, across a range of language groups) and monolingual. Some advantage was noted in social interaction skills for the simultaneous bilingual group, with the sequential bilingual children having the lowest scores in this area. Ohashi et al. (2012) carried out a similar comparison between recently diagnosed bilingual (English-French) children with ASD and monolingual peers matched according to age and non-verbal IQ. Both groups showed comparable language skills across domains measured (receptive and expressive language, first words and phrases). Reetzke et al. (2015) compared bilingual and monolingual children from Chinese families using parent reporting through the Childhood Communication Checklist-2, which includes questions about pragmatic skills. As with the previous studies, the findings across language domains and pragmatics showed no significant difference between the groups.

Studies of children with DLD also present findings that children with language learning needs can acquire two languages simultaneously or sequentially (Drysdale et al., 2014; Kay-Raining Bird et al., 2016). Paradis et al. (2003) compared tense and non-tense morphemes of simultaneous bilingual (French-English) and monolingual (English and French) children with DLD. All children showed greater difficulty with tense morphemes, with similar results across all language conditions. Blom and Paradis (2013) compared sequential bilingual children and found that past tense markers were equally affected in bilingual and monolingual children. Other studies have found that bilingual children with DLD have similar profiles across grammatical and vocabulary measurements when compared with monolingual peers (Gutierrez-Clellen et al., 2008; Salameh et al., 2004; Thordardottir, 2011).

In comparisons of bilingual and monolingual children with DS, findings match the research on children with DLD and ASD. Most of the studies focused on simultaneous bilingual acquisition in children with DS. Bilingual and monolingual peers demonstrated comparable language skills when matched with typically developing (TD) peers of the same developmental level (Cleave et al., 2014; Feltmate & Kay-Raining Bird, 2008; Kay-Raining Bird

et al., 2005). Edgin et al. (2011) compared simultaneous bilinguals with DS (second language was predominantly Spanish) to matched monolingual peers and reported no disadvantage in language skills from exposure to another language. Edgin et al. (2011) stated that “given the absence of any detectable costs associated with SLE (second language exposure), the social benefits of learning to communicate with all members of the family and community may be well worth the effort to expose children with DS to a second language” (p. 355).

As previously mentioned, parents may at times adopt a monolingual family language policy, out of concern for a child with language-learning needs. Yu (2016) studied the language environment of one Chinese family, whose child had ASD associated language-learning needs. The family had intentionally chosen a monolingual approach in communicating with their child. Analysis revealed that the predominant language used in the child’s environment was Chinese (95% of family interaction). In contrast, the adults spoke English only to their child/grandchild up to 98% of the time. English words used were not always pure translations but were assimilated with Chinese concepts. Yu (2016) gives the example of the words ‘eat rice’ being used to communicate the idea of coming together for a meal, rather than the literal meaning of eating rice. The language used by adults in meaningful and motivating interaction appeared to have the greatest impact on the child’s response to communication (Yu, 2016).

Minimal intervention studies have been carried out to investigate whether instruction using L1 and L2 could result in progress with L2. Perozzi and Sanchez (1992) carried out intervention in English and Spanish with one group of students, and English only with a second group. The target skills of prepositions and pronouns were acquired in half of the intervention time, when introduced in two languages. More recently, Thordardottir, Cloutier et al. (2015) carried out a similar comparison of bilingual versus monolingual intervention, including parent collaboration during practice sessions. Treatment targeted both vocabulary and syntax and resulted in significant vocabulary gains in L2 in the bilingual intervention condition, with no significant difference in syntax development between the bilingual and monolingual conditions. In Korean children with ASD, language intervention in both Korean and English also resulted in learning across both languages (Seung et al., 2006). While further evidence is needed to quantify the positive impact of dual language intervention, for children with CCN, the need for this support is clearly expressed by parents,

researchers, and practitioners alike (Kay-Raining Bird et al., 2016; Kay-Raining Bird et al., 2012; Marinova-Todd et al., 2016; Seung et al., 2006; Thordardottir et al., 2015).

As has been outlined, children with language learning needs develop language in similar ways whether they are monolingual or bilingual. Emerging evidence is also showing that instruction in L1 and L2 could facilitate progress in L2 (Edgin et al., 2011 ; Perozzi & Chavez Sanchez, 1992; Thordardottir et al., 2015). Using evidence-based strategies and approaches such as focused language stimulation is important in both languages (Thordardottir et al., 2015). These strategies may include vocabulary instruction that engages in repeated exposure to words in meaningful contexts, using recasts to model correct grammatical structures, and expansions to increase utterance length (Romski, 2005).

Dual Language Learners and AAC

One further approach to support language development for dual language learners with CCN is provision of AAC systems (Romski, 2005). As with monolingual peers, children who are dual language learners benefit from these systems to participate meaningfully in all aspects of society, including family life and schooling (Mindel & John, 2018; Soto & Yu, 2014).

AAC System Language

When a monolingual child using AAC begins schooling, the language of the AAC system is also the language to which they have been exposed (Mindel & John, 2018). For dual language learners using AAC, the language of their AAC system is L2, the dominant language of the school system. Mindel and John (2018) express that with the increase in AAC use for children with CCN, the need to integrate L1 is often not considered. This can lead to AAC systems with L2 vocabulary not being used at home, where L1 is spoken (Mindel & John, 2018). Soto and Yu's sociocultural approach to AAC requires that children have opportunity to engage in meaningful contexts using L1 (Soto & Yu, 2014). To do so, professionals and parents need to work together to ensure that the language needed for all language environments is available on the children's AAC system.

Perspective of Parents from CLD Background

The importance of engaging families to identify meaningful L1 language is clearly stated in the literature (Mindel & John, 2018; Soto & Yu, 2014). Open communication and a positive mindset towards their culture and language is valued by families (Parette et al., 2001). Parette and colleagues (2001) used focus groups to explore what was important to

parents from CLD backgrounds in regard to AAC intervention. Results indicated that parents wanted to have clear information about services, be involved in selecting focus areas for intervention, and be provided with training to support their children in using AAC. Establishing trust in the professional relationship was considered important, along with having their insights valued (Parette et al., 2001). Parents need to receive information regarding service delivery and AAC strategies and approaches in a language that they can understand – either through an interpreter, or translated information, or preferably in both spoken and written modalities when English is not a language family are confident in using (Mindel & John, 2018).

Collaborative Planning for L1

Intervention for dual language learners using AAC needs to be planned collaboratively with families to integrate both L1 and L2 in culturally responsive ways (Soto, 2018). Provision of L1 vocabulary in any AAC system is essential to the child learning language and developing communicative competence within the home context (Huer et al, 2001; Soto, 1997). The child and their parents need to be comfortable with the voice and accent that is used on the AAC system. Symbol selection also needs to reflect the family's culture and be respectful of their values (Mindel & John, 2018). Soto (2018) suggests that respectful enquiry into cultural practice and family perspectives are needed, along with a commitment to hear parent concerns and preferences. 'Cultural reciprocity' (Soto, 2018, p. 146) occurs when a relationship of mutual learning develops and growth in understanding of the child and family's needs takes place. One aspect related to this is considering whether goals related to increasing choice-making and independence are culturally responsive goals, or whether these are dissonant with the family's culture (Soto, 2018). By contrast, goals related to increasing connection with the wider community may be more in keeping with the family's culture. Mindel and John (2018) state that "culturally and linguistically relevant vocabulary and family-valued implementation opportunities need to be identified in order to reach the needed level of family buy-in and increase communicative success" (p. 154).

AAC Systems for Dual Language Use

Several approaches to AAC system setup have been discussed in the literature. Mindel and John (2018) suggest that programming AAC systems to enable code switching between L1 and L2 can support children and families with engagement. Icon selection, greetings, and heritage language can also support meaningful engagement at home. Using

AAC system features to alter skin tone, and to programme culturally appropriate symbols is also important to consider, in conversation with family (Mindel & John, 2018). Mindel and John (2018) suggest that using the vocabulary discussed with family at school provides important opportunities to increase practice and enhance the likelihood of generalising use into the community. Providing opportunity for children to engage with language learning services within schools using AAC can create further support for bilingual acquisition (McNamara, 2018).

In recent years commentaries have been presented regarding the importance of bilingual engagement with AAC (McNamara, 2018; Mindel & John, 2018; Solomon Rice et al., 2018; Soto, 2018). Mindel and John (2018) highlight that while there are many children from CLD backgrounds in schools requiring AAC, there is limited research available to guide intervention.

Summary

In summary, the literature highlights the importance of building communicative competence of children who use AAC, and their communication partners (Beukelman & Light, 2020). Assessment and intervention need to occur within natural contexts, with the supportive of a collaborative team (Hartas, 2004). For children who are dual language learners and use AAC, culturally responsive practice centres on parent and child priorities, and developing shared understanding (Brassart et al., 2017; Mindel & John, 2018). The literature regarding dual language learners who have language needs provides evidence that bilingual intervention does not disadvantage and can support dual language acquisition (Kay-Raining Bird et al., 2016; Kay-Raining Bird et al., 2012; Marinova-Todd et al., 2016). For children who use AAC, the need for a sociocultural approach is important so that they can learn to communicate in the different language environments in which they interact (Soto & Yu, 2014).

Chapter 3: Methodology

This chapter outlines the methodology used to answer the research question – What are the outcomes of an intervention that consists of collaborative planning and dual language focus on engagement with AAC? The rationale for choosing a case study design is explained, along with description of the context and participants in the study. Detailed procedures for the project are provided, and tools for data capture are outlined, along with approaches to data analysis. The chapter concludes by addressing ethical considerations and validity of the research.

Research Design

A qualitative research approach was employed due to the complexities of each aspect being explored - AAC system use, dual language learning, and collaboration across the busy contexts of home and school, with their varied perspectives and priorities (Creswell & Poth, 2018). Qualitative design allows for these areas and the interaction between them to be explored in the natural settings in which communication occurs. Within the field of AAC, qualitative analysis provides a robust approach when diversity of individual users is not necessarily comparable (Creswell & Poth, 2018).

A case study design was chosen, as this approach can enable in-depth exploration through a broad range of data sources (Creswell & Poth, 2018). This method also provides opportunity for direct observation and personal interaction with participants, as the effects are occurring (Punch & Oancea, 2014; Yin, 2014). Data captured is descriptive, providing enough information so that others can enter the stories told, see how findings were formed, and make their own assertions. The range of data collection sources can include observation, documentation, physical items, interviews, and archival records (Yin, 2014).

In case study design, the boundaries of the case are clearly defined, along with the types of data that will be collected. The boundaries of the current case study were limited to the focus child, his/her parents, and school staff – teacher, learning assistant, ESOL teacher, Special Needs Coordinator, occupational therapist, physiotherapist, and the researcher-SLT, as well as class peers. The researcher was a participant-observer, involved in action research as part of the child's team. The involvement of a cultural advisor was considered prior to the study however the child's father was comfortable communicating in English and discussing their family language and cultural values. The peers included were limited to those whose communication the child responded to. These peers were all from the child's

main class (a satellite class which supports 12 children with a range of complex learning needs) due to the challenges related to gaining consent for a larger peer group. The focus child also attended a mainstream class (where child attended twice weekly for specific lessons), and an ESOL class (usually twice weekly when there were no COVID-19 restrictions in place). The physical boundaries were set within the child's home and school environments.

Context

The context for the current study was the researcher's workplace, a large primary school in a New Zealand city. The importance of the research project arose in this setting because the school serves a culturally and linguistically diverse population. Approximately 80% of the children in the school are bilingual - this includes immigrants and those born in New Zealand. Due to the diversity of children in the school, a strong ESOL programme operates. Small group learning takes place across the week, led by three ESOL teachers, for children who meet school criteria. Assessment takes place using the English Language Learning Progressions (ELLP) matrices (Ministry of Education, 2008). The school senior management team expect all teachers to engage dual language learners by gaining knowledge of children's L1 skills and providing opportunities for them to talk about their learning with peers or adults who also speak L1 (Baker & Wright, 2017; Cummins, 2000). School ESOL teachers provide a range of supports to teachers, including professional development, shared planning, completing ELLP documents, sharing resources for national language weeks, and building relationships with children and families. Celebration of cultural and linguistic diversity occurs through school and community events and use of resources for national language weeks, for those represented in the school population. Children are encouraged to wear clothing reflecting their ethnicity for musical and cultural events held in the school and community. The school has Kapa haka, Teina, and Pasifika groups, along with Bollywood dancing, and Japanese fan dancing. These groups regularly perform at school and community celebrations.

Within the primary school, there is a learning centre of four classes where teachers and support staff provide differentiated learning programmes for approximately 45 children who have met the Ministry of Education criteria for On-going Resourcing Scheme (ORS) funding. To qualify for this funding, children require additional support with physical, learning, language, social communication, hearing, or vision needs. Children with ORS

funding require the highest level of support in school, including significant curriculum adaptations, specialist teachers, regular therapy input, and shared support from learning assistants. Discussion between the ESOL teacher and specialist teachers takes place to identify children who may benefit from attending ESOL classes. Children in the centre also take part in school-wide groups, based on their interests and/or family culture. Some children have participated in the Kapa haka, Teina and Bollywood groups mentioned previously, performing alongside their peers at celebrations. Most children within the centre are sequential bilinguals, having had minimal exposure to English within the home. Some parents have chosen to interact with their children in English, even though they speak L1 with each other, therefore the home environment can be considered bilingual (Yu, 2016). Among the centre staff, many of the learning assistants, and two of the specialist teachers are bilingual. Languages known by staff include Maori, Hindi, Tamil, Samoan, and Dutch.

Recruitment

A letter was sent to the Principal of the primary school (Appendix A) with information about the project, and a request to approach participants within the school community. The Principal gave consent, and a time was made to meet with the school's Special Needs Coordinator (SENCO) to discuss recruitment. The child participant needed to be a dual language learner with complex communication needs who used an AAC system. At least one parent of the focus child needed to be able to communicate comfortably in English. A child and family were identified as meeting the criteria and were approached by the SENCO with information regarding the project and were given the opportunity to ask for further information. The child's parents and their child gave consent. Staff members who worked with the focus child were approached and asked to consider participating in the project. This included the class teacher, learning assistant, ESOL teacher, physiotherapist, and occupational therapist. All staff members approached gave their consent to participate.

Participants

The following paragraph describes the participants and provides some general information regarding each of them. The focus child's name has been changed to maintain his privacy. The name chosen, 'Manvir', reflects something of his character and means 'brave heart'.

Child

Manvir is a 10-year-old boy. He lives with his parents and sister, and his wider family live overseas. Manvir's first language (L1) is Gujarati. At home Manvir likes physical

activities, such as riding on his bike or scooter (which he does with his dad's support). In the school context, most of Manvir's learning takes place in a learning support classroom which he attends with 11 peers (Year 4 to 6). Manvir appears to enjoy school and participating in class and school events.

Manvir has a diagnosis of cerebral palsy (spastic dystonic quadriplegia) and developmental delay. He receives ORS funding. Manvir communicates using single words and simple phrases. Adults interpret his words and phrases based on shared experiences and familiar contexts. Manvir's speech clarity is impacted by speech sound omissions and substitutions (e.g., stopping, cluster reduction, syllable reduction), along with imprecise and slow movement of the speech mechanisms associated with dysarthria. Manvir has a NovaChat AAC system to support his language development and expressive communication, funded by the Ministry of Health. During the research project, Manvir's NovaChat had been sent overseas for repairs and he was using the class communication iPad with TouchChat (based on the same WordPower software). Manvir was keen to be involved in programming both systems.

Parents

Manvir's parents came to New Zealand from Asia early in his life – his dad arrived first to settle into his job and find a home, and Manvir and his mum came later. They have regular contact with school staff. Manvir's parents want him to be as independent as possible and work hard with him on developing skills. They carry out physical therapy exercises with him daily. Manvir's mum also works with him on maths and writing tasks, and a carer does similar learning activities. Manvir's dad speaks English, and his mum is learning English. Manvir's dad translates school information for his wife, and he usually attends meetings due to his competence in English.

Teacher

Manvir's teacher has been a teacher for 12 years. She has worked at this school for the past two years, most of that time as Manvir's teacher. Previously she had taught across primary school year levels. She has degrees in teaching and in linguistics. The class programme is focused on teaching level 1 of the curriculum across all subjects. Manvir's teacher has two students in her class with their own AAC systems and other students can use class AAC tools.

Learning Assistants

Both learning assistants (LAs) who participated in the project are bilingual, one sharing Manvir's L1. They have both worked in the centre for many years, and have a longstanding relationship with Manvir, one of them across two different classes. During their time in his class, neither was with Manvir full-time, as other LAs would also support students at different times of the school day.

Therapists

Manvir receives therapy support from the centre physiotherapist (PT), occupational therapist (OT) and speech-language therapist (SLT). Each of these staff members work collaboratively with the classroom team and families to support participation in school and family life. The PT and SLT have worked with Manvir since he started school, and the OT joined the class team during 2020, the year the project began. The school SLT is also the researcher for this project.

ESOL Teacher

Manvir's ESOL teacher is multilingual and speaks the same L1 as him. She began working as a classroom teacher at the school then joined the ESOL team. Manvir usually attends two small groups each week, with two different student groups based on the needs of learners. Due to COVID-19, there was a limitation on participating in these during 2020 and 2021 due to restrictions in place and with consideration of Manvir's health needs.

Peers

In the classroom with Manvir, there are 11 other students with a range of learning, physical, sensory and communication needs. These students all receive ORS funding, which provides them with a higher level of support in a smaller class size to meet their specific needs. The students show a sense of community in the classroom and are supported to participate in learning activities and to develop social skills through group work and topic studies. While English is the second language of most students in the class, many caregivers have stated that their child responds in English when spoken to in L1.

Researcher-SLT

The importance of describing the relationship of the researcher to the project has been clearly set out in qualitative analysis literature (Creswell & Poth, 2018; Punch & Oancea, 2014). It is well understood that the experiences and values of the researcher influence the data that is captured, and the analysis of that data (Creswell & Poth, 2018;

Punch & Oancea, 2014). The following paragraph outlines the experience of the researcher, and the factors influencing selection of the current research area.

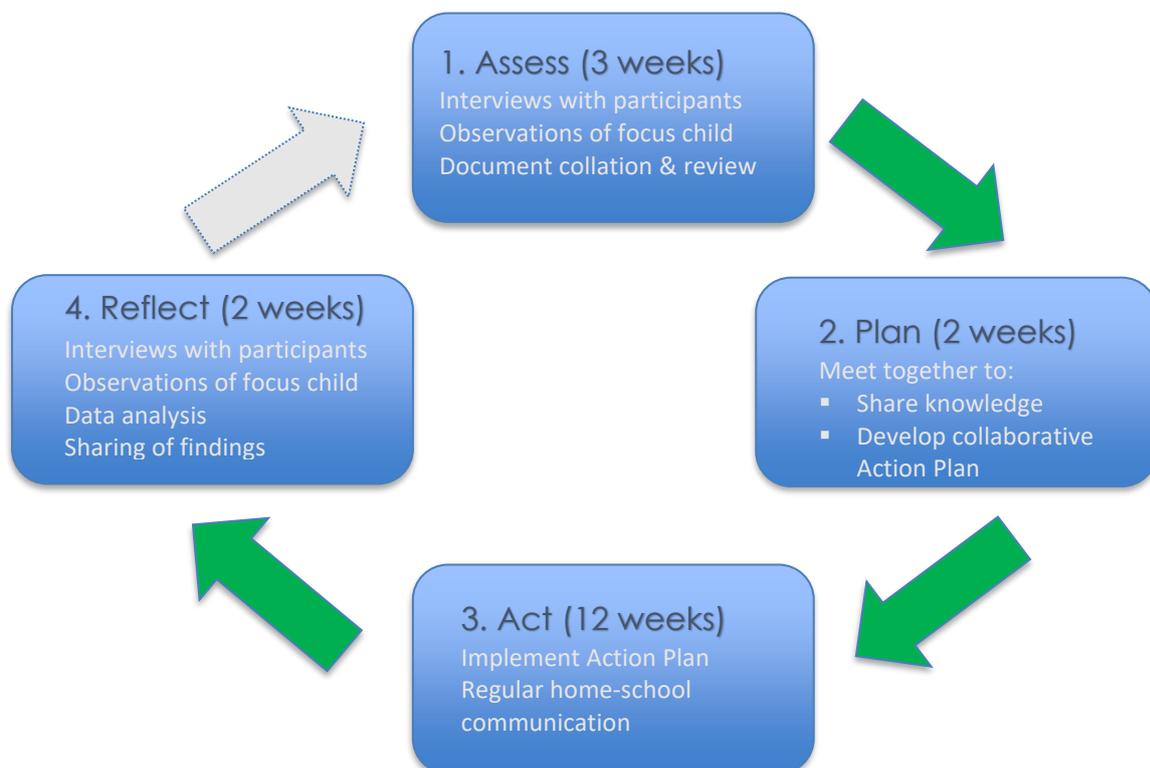
The researcher had worked as an SLT at the school the child attends for the past 13 years. Most children within the centre present with CCN. To meet the needs of these students, the researcher had pursued additional learning, particularly regarding AAC and literacy. Existing studies have investigated strategies to increase engagement with AAC and adapting literacy instruction for students with CCN. The current research project arose from a desire to increase access to AAC for bilingual children and families. Most AAC systems currently available in the New Zealand context do not cater for languages spoken within the researcher's school community.

Research Phases

The research project took place through four phases, across two school terms. The phases followed an Inquiry framework used within Manvir's school setting, and included: assessment (phase 1), collaborative planning (phase 2), acting (phase 3), and reflecting (phase 4). An overview of the phases and data sources gathered is depicted in Figure 1 and explained in the following paragraphs.

Figure 1

Overview of Phases and Data Sources



Phase 1: Assess (3-week period)

This phase involved interviews with participants and observations of Manvir at home and school. In Phase 1 interviews, questions were focused on language and cultural information (family), ways the child communicates (parents and school staff), perspectives of AAC (parents and school staff), and strategies used to support communication (parents and school staff). Guiding questions were used for all interviews (Appendix C & D). Relevant school documentation was collated and reviewed, including Individual Education Plans (IEP), previous school and therapy assessment data, and SLT case notes.

Semi-Structured Interviews. Semi-structured interviews took place with each participant at times and places convenient to them. Each interview was audio recorded, with permission of participants, to accurately capture their perspectives. The parent interview was used to understand parent perspectives regarding Manvir, and to learn more of the family's culture and language (Berryman et al., 2013). Interviews with all participants included discussion regarding current communication modes used by the child, knowledge of L1, AAC system use, and perceived communication needs. Interviews with the class teacher, learning assistant, therapists, and ESOL teacher also explored opportunities to engage with L1 within the school context.

Child Voice. Manvir was present during the parent interview, and the Phase 2 meeting. He was attentive and affirmed what was being said by his Dad vocally, as well as responding to simple questions regarding his perspective. The Universal Declaration of Human Rights (United Nations, 1948) states that we all have a right to express our own opinions and therefore it was important for Manvir to be central to the project and any communication focused on him. The Communication Bill of Rights (Brady et al., 2016) was also considered a key document included in preparation for the project, as this provides clear direction regarding the rights of children with CCN to have their voices heard, through whatever modes possible.

Observations. Observations of the child took place at home and school. For practical purposes, one longer observation (approximately 45 minutes) took place at home rather than observing on different days and times. At school, observations took place in different contexts across one week for ten to fifteen. Note taking and video recording was used to document the observations. Observations were analysed to gain information about the range of ways adults facilitate communication (e.g., modelling or prompting, verbal or non-

verbal, use of AAC system) alongside the range of modes the child used to communicate (e.g., vocalisation, gesture, AAC system).

Phase 2: Plan (3-week period)

This phase involved a meeting with Manvir and all adult participants, to share knowledge of him and his interests and needs, discuss his language and culture, make decisions regarding AAC system use, and to develop an Action Plan for phase 3.

Knowledge Sharing & Planning. A summary document of information gathered in interviews was shared with team members, and key points discussed. Communication needs of the child were shared by parents, with additional insight into personal safety and daily home-school communication. Following this, priority vocabulary was identified that parents and staff all agreed was important for bilingual focus. Contexts and times for practice were discussed and a general plan agreed to including practice during shared book reading (OT and parents), ESOL classes, SLT practice sessions, and class news times. AAC system and strategies for the project were considered. Team members all agreed that the current system available in class was the most appropriate which was the class iPad with TouchChat and WordPower. Discussion took place regarding the programming of the Gujarati vocabulary, and Manvir's father said that he was happy to do this.

Following the meeting, the SLT sent the draft plan for the Act phase to parents and the school team by email (Appendix B).

Phase 3: Act (Term 4, 2020 - 7 weeks; Term 1, 2021 – 5 weeks)

Implementation and support. The action steps planned during phase 2 were implemented across 7 weeks of term 4 2020 and 5 weeks of term 1 2021 at home and school. Participants were given opportunity for clarification or support through regular contact with the researcher-SLT in person, by email, or by phone.

Phase 4: Reflect (2-week period)

This phase involved follow up interviews with participants, observations of Manvir's communication, and analysis of data collected.

Interviews. A debrief took place using semi-structured interviews, to give opportunity for participants to talk about their experience of the process, including reflecting on the collaborative project, the child's understanding and use of target vocabulary, and experience of using the AAC system. Participants were informed that they

would have further opportunity to discuss the findings of the research, and implications for practice within the centre, as part of the SLTs on-going collaborative work.

Observations. Follow up observations took place to compare any differences in Manvir’s communication. The home observation took place on one occasion for approximately 45 minutes, as this was more convenient for the family than visits at different times. At school the observations took place across the contexts of class news time, OT shared book reading session, physio session, and ESOL class for 15-20 minutes each, across two weeks.

Data Collection

The data collected for this project was gathered across the four phases, as depicted in Table 1.

Table 1

Data Collection Across Phases

Phase	Data collection
Assess	Semi-structured interviews: parents, teacher, learning assistant, ESOL teacher, therapists. Observations: home, classroom. Document analysis: IEP, emails relevant to research project, existing school assessments and therapy assessments.
Plan	Meeting notes, emails, and action plan.
Act	Meeting notes, case notes, emails.
Reflect	Semi-structured interviews: parents, teacher, learning assistant, ESOL teacher, therapists. Observation notes and video recordings: home, classroom, ESOL class, therapy spaces. Case notes.
	SLT-Researcher reflection notes were captured across all phases.

Interviews

One of the strengths of interview data is that it allows the researcher to focus in on a specific area, whilst giving opportunity for presenting a range of perspectives of individual participants (Yin, 2014). Interviews were carried out using guiding questions, which also created open space for conversation so that participant voice was sought and heard regarding the area under study (Yin, 2014). Punch and Oancea (2014) highlight the importance of relational aspects, such as building rapport and trust, which is likely to impact on the quality of the data. Data collection tools included interview guides to cue questions within the boundaries of the research, in a place and time selected by the participants.

Observation Data

The richness and authenticity of case study research is captured by observing the participants in real contexts, as they interact with each other. In doing so, the researcher needs to be present in a way that does not change the dynamics of the participants' interaction and their lived experience (Punch & Oancea, 2014). To prepare for observations, decisions were made regarding the focal points of interest, though these also emerged through the observations themselves (Punch & Oancea, 2014).

In the current study, observation data was captured across a range of contexts, including the classroom, ESOL class, therapy spaces, and at home. Observations were video recorded to ensure accuracy of the observation data and as a reference to verify written notes recorded. Observations occurred in Phase 1 and Phase 4 of the project to provide comparison data. The quality of observation notes and video recordings is important to capture evidence that may indicate a change in the AAC use through the research project. With the researcher also being a team member, care needed to be taken to balance the roles of observer and participant. During observations, the researcher-SLT acknowledged any direct communication from the participant child, and then redirected the child to the activity and person they were engaged with.

Notes

Observational notes. These notes were recorded during each of the observations, focused on the message that was being communicated by the child, the mode of that communication, and the language context (e.g., question, comment by another). These were enhanced by use of video recording during the observations.

Case notes. During the project, therapy case notes captured conversations with parents and staff, notes from therapy sessions with Manvir, observations of classroom communication, and email documentation.

Reflection notes. The SLT-researcher documented her own reflections throughout the research project, noting significant conversations, events, and influences related to the what was occurring, and her own responses and thoughts regarding those (Creswell & Poth, 2018; Mills, 2014).

Documentation

Access to a range of documentation is beneficial in case study research as this can add to the breadth of data gathered across a broader range of time and situations. Documentation can also be viewed as neutral and stable, as the information was captured independently of study and can be repeatedly viewed for analysis (Punch & Oancea, 2014). Weaknesses of these forms of data include incompleteness of information, and bias of those who recorded these sources. In this study access to data was possible and included therapy case notes, SLT assessment data, IEP documentation, meeting notes, and school-wide data.

Previous case notes. Therapy case notes were used to gain relevant information including previous language samples, communications between home and school and across the school team, communication with outside agencies, and information regarding the child's culture and L1.

SLT Assessment Data. Previous SLT assessments were held on the child participant's file and analysis recorded within the case notes. This source provided important background and historical information to contribute to knowledge of the child's communication profile and record of progress.

IEP Documentation. Six monthly IEP planning meetings take place with school staff and family members. This documentation contains data regarding the child's home and school progress across the key competencies (Managing Self, Participating and Contributing, Relating to Others, Using Language Symbols and Text, and Thinking). Other sections in these documents capture medical information, student wellbeing, and social supports and activities (including cultural events). Information from the child's IEP was utilised to gain additional insight into the child's communication in home and school contexts.

Meeting Notes. Other school documentation for collation and review included minutes of previous staff meetings, and class team meetings, in which Manvir was specifically discussed.

Other School Data. School-wide data is captured on an electronic system and contains information about school attendance, previous school reports, and teacher assessment records. Also relevant were ESOL timetables, and school policy and guidelines relating to strategies for dual language learners.

Data Analysis

One of the approaches used in qualitative research is inductive analysis of data, which allows themes to emerge from the raw data, rather than preconceived ideas and measures driving analysis (Gibbs, 2015). This takes place through preparation and coding of the data, which leads to development of themes (Thomas, 2006). Qualitative approaches provide evidence of triangulation of the data, and trustworthiness of the analysis.

Preparation and Coding

Prior to analysis, data was prepared into a consistent format by transcribing interviews and recordings, and collating case notes, meeting notes, and assessment data. Once the data was prepared, multiple readings took place and coding began. The analysis of the current project took place using Nvivo software (2018), which provides flexibility in coding, including the ability to easily merge codes, and move data between codes. Data from all sources (interviews, observation notes, case notes, etc) were entered into Nvivo (2018) for coding. The codes were given representative names, and a description of the codes were documented, to clarify the boundaries of that code and the thinking that lead to formation of the code (code memos). All text with the same idea was then assigned the same code. Further analysis occurred within coding, such as establishing how the ideas across codes related to each other.

Developing Themes

During analysis, coded documents were examined which showed the range of data included within each code. Each source of data could also be viewed independently showing the coding that had been carried out. In these ways, Nvivo (2018) supported integration of data sources across codes and themes. Paper copies of coded documents were also reviewed to further analyse and check for integration of coding across sources and times. As relationships between codes became evident, themes were identified (Thomas, 2006).

Trustworthiness

Triangulation is one approach used in qualitative research to assure accuracy of data analysis and validity of findings. Aspects of triangulation include comparisons across data sources (e.g. documentation, observations, interviews), participants, investigators (involving others in cross-checking data analysis), and theories (Creswell & Miller, 2000). Ideas or themes 'converge' across sources, time, and context as data is analysed from interviews across participants, observations across settings, and meeting discussions across time.

In the current study, a wide range of documentation was collated (IEPs, assessment, school data), interviews took place from a range of participants with varied perspectives, and observations further contributed evidence across the home and school settings. Triangulation of the data took place by comparing data obtained in observations notes, viewing video related recordings, and checking these alongside case notes to verify the information. Points of convergence and difference were identified, analysed, and reviewed by the researcher and discussed with supervisors.

Throughout the analysis, university supervisors regularly viewed coding and provided feedback regarding this. At times redundant themes were identified and overlapping themes merged (Thomas, 2006). Key themes were identified and discussed with supervisors and further decisions made regarding which were most significant to answer the research question.

Member checking was used to increase validity of the findings (Mills, 2014). As themes emerged, two participants were available to carry out peer review of the draft coding book and provide feedback regarding these. The participants verified the findings fitted within their experience and observations of the project. Feedback was also given regarding the wording of the themes, towards positive collaborative language, along with bringing forward a sub-theme related to hearing parent voice. They also emphasised the importance of the child agency theme, recognising his role as the central participant and collaborator within the intervention.

Information provided through the Methods chapter, and information in the Project Plan (Appendix B) support Transferability of the intervention (Mills, 2014). The description regarding the settings and participants, along with information regarding programming of Manvir's AAC system with parent support, all contribute to possible replication of the study within similar contexts with other students. While children with CCN are unique and each

have their own communication skills and needs, many of the same AAC systems and support services utilised in the project are in place in other countries and contexts.

Ethical Considerations

Careful consideration of ethical factors took place, due to the vulnerable nature of the child participant, their peers, and complexity of the issues being studied. The Massey University Code of Ethical Conduct (2017) was followed in preparation for the study, and approval for the project was given by the Massey University Ethics Committee (Appendix E).

The initial approach to participants was made by the principal. This was to minimise the possibility that participants felt coerced because of their relationship with the researcher. The Information Sheets to all participants clearly stated the procedures, time requirements, and their rights (Appendix F & G). The information was presented in English, as one parent of the child participant was comfortable and competent communicating in this language. Opportunity was given for verbal clarification prior to written consent being formalised. Following parent consent, verbal assent was sought from the child participant using a visual social story (Appendix H). All participants were advised that they could withdraw from the study at any stage.

Consultation took place with the school kaiārahi to ensure that the Te Ara Tika guidelines (Hudson et al., 2010) were followed in this project. The guidelines highlight the importance of establishing relationships with participants that are characterised by transparency, honesty, justice, and hope. The kaiārahi recognised that the uara (values) of manaakitanga (extending aroha to participants) and whanaungatanga (a sense of belonging) have been integral to the thinking and preparation for the case study. Manaakitanga was enacted through providing awahi (support), active listening and coaching, walking the experience with participants, and following through on what has been agreed. Whanaungatanga was experienced as the child, family, and school staff gained richness from increased knowing of each other, of understanding how to support Manvir using AAC, and greater awareness and value of cultural and language differences.

All documentation related to the project was stored securely, including electronic files which were held on password protected computers. Consent forms were stored separately to further ensure confidentiality.

Chapter Summary

This chapter outlined a rationale for case study design as a suitable approach for this investigation. Participants have been described, along with the settings in which they interact, and their relationship to each other and the researcher. Procedures for the project were outlined, along with the data sources captured. The data analysis was described, including the process of coding, and development of themes. Ethical factors were discussed, with careful consideration to the complexities of the case, the importance of respect across cultures, and how to protect the rights, choices, and voices of the participants. The following chapter will explore the themes that emerged from the data, the relevance to the research area, and further areas to be investigated.

Chapter 4: Results

The aim of the research project was to investigate the outcomes of home-school collaboration and use of dual language strategies to enhance engagement with AAC. The data described in the methodology outlined in the previous chapter were gathered and analysed. The themes that emerged from the data were organised into themes relating to the Child Participant, and themes relating to Adult Participants. Table 2 shows the relationships between key themes, organising themes, and basic themes.

Table 2

Themes

Child Participant – Global Themes	Organising Themes	Basic Themes
Enhanced Communication Clarity of Child through AAC	Increased Use of Target Words	Feelings and Health Words Question Words
	Increased Engagement with Peers	
	Increased Understanding and Use of L1	
Enhanced Child Voice		
Adult Participants – Global Themes	Organising Themes	Basic Themes
Increased AAC Implementation Across Settings	Changed Perceptions of AAC	At Home At School
	Growth in Confidence Using AAC	
	Increased Engagement with AAC	At Home At School
Growth in Shared Understanding	Increased Understanding of Child Needs Through Eyes of Parents.	Insight into Child Safety Partnering with Parents
	Enhanced Collaborative Planning of AAC Needs	Shared AAC Planning Communicating with Family Communication with School Staff

Enhanced Communication Clarity of Child through AAC

The changes observed with child use of AAC were captured by the global theme of Enhanced Communication Clarity through AAC. The child outcomes that emerged within this theme was further analysed into three organising themes: Increased Use of Target Words, Increased Engagement with Peers, and Increased Understanding and Use of L1.

Increased Use of Target Words

The organising theme of Increased Use of Target Words was divided into two basic themes in the data. These were described as Feelings and Health Words, and Question Words.

Feelings and Health Words. During the collaborative meeting in the Assess phase, Manvir's parents had expressed concern regarding their child not being able to communicate about his personal safety. One LA noted that Manvir did not communicate negative feelings and was not assertive about his preferences. An example of this was early in the Act phase when he came to school with a bad cold and temperature. When asked how he was, Manvir signed GOOD, and he continued to indicate GOOD when his AAC system was accessed for him. The LA noted that by the end of her time with him (midway through the project), "he wasn't being grumpy or anything, but he was being honest about his feelings ... and I expect that carried on." She also commented that "he'd been learning that he can [express emotions], and he had in his mind permission to". While there was some progress in using the emotion words at that stage, the intervention was extended into the Term 1 of 2021 to consolidate learning.

In Term 1 2021, a LA from a different class, who shared the same L1, began working with Manvir. During the Reflect stage she commented on the focus child's understanding of the emotion vocabulary. She recognised that he was using facial expression alongside his use of the AAC system: "So for him I have like noticed, like when he used to say sad, like you know "*chinta*" that he was showing [this] on his face". She made a similar comment in relation to him using 'happy' in L1: "So I have noticed, I don't know other people have noticed or not, but specially... when he said "*khush*" means happy then the happiness on his face, it was kind of like, you know, amazing". Other participants also reported noticing an increase in Manvir's use of emotion words. In the SLT-researcher's case notes it was observed that he was using the emotion words accurately and consistently, including using these to ask about whether other people were "*happy*" (using AAC system and looking at

person) or “*angry*” (in L1).

One aspect identified in the Assess and Plan phase related to Manvir’s need to communicate when he was hurt or unwell. Family and staff had expressed concern about him communicating when he was sore due to equipment, such as orthotics, rubbing against his skin. The physiotherapist made the comment that “it is really important that he can communicate in relation to pain, and he was actually very clear when we were using that with the bilingual buttons that he wasn’t experiencing any pain, so that was really reassuring... we were also able to use it to get feedback at the end of the session about whether it was a good session and how hard he had worked and things like that.” The following interaction took place during her final session with Manvir child, prior to the Reflect stage.

Physiotherapist: {*Can you tell me about your knees while you’re in there? “knee”*}

Manvir: “*khush*”

Physiotherapist: *Your knee’s happy?*

Both smiling, laughing together.

While the Manvir did not communicate any negative words about his physical state, he had begun to use “*gusso*” (angry) consistently. He used this both during his L1 teaching time in class, during interaction with staff both as a joke, and to ask what made them angry. In the final observation at home, he also used “*gusso*” clearly and accurately, to communicate how he had felt when he was hurt because his sister had accidentally knocked him over.

Question Words. The focus on question words was chosen by the collaborative team because of the identified need for Manvir to use these in conversation. During the Assess phase, the SLT observed that the Manvir was not able to locate the ‘Question’ page. He was also not consistently able to discriminate between the symbols for question words. During the Act phase, Manvir practiced using the Gujarati-English question words with his Dad, with the occupational therapist, and with the SLT-Researcher. He sometimes selected question words to teach peers and staff during the class ‘news’ time. During shared book reading, the OT observed that Manvir had not yet shown understanding and use of question words. She adjusted the sessions to reduce the content of the book being read, and to simplify the questions. Some signs of learning were noted as the intervention continued. Later in the Act phase, Manvir’s teacher commented that he had “...today asked a question and linked

Gujarati with English.”

By the end of the intervention, Manvir was able to locate the question page when his Dad asked him to find this. While spontaneous use of questions words was not observed during conversation, Manvir had gained confidence in identifying some of the symbols when asked to do so by adults. During the final interview the OT noted that Manvir “was starting to differentiate between the where, the why, and the what. Whereas earlier in the process I felt that he was struggling to differentiate.” This progress was also seen during the Phase 4 observations with Manvir’s father. The following shows that he had learnt the association between the Gujarat word for ‘when’ (kyare):

Dad: *If we ask about the time then which one you go, in Gujarati maybe. What is this called?*

Manvir: *“Kyare”*.

Dad: *Kyare* (smiling and child smiling).

Manvir’s Dad reflected on his over-all progress with finding and using these words during the Reflect interview, as follows:

I think he got so comfortable navigating to the page. It’s just he sometimes confused himself. That is more to do with understanding, remembering which is the question that time... But I think navigating, it’s good enough.

Increased Engagement with Peers

Manvir’s motivation to interact with peers was highlighted by all the school staff during the Phase 1 interviews. His teacher reported that he is “very social”, and one LA noted that he loves to communicate about his peers. During the Phase 1 interviews, both also observed that Manvir would use his body and actions to attempt to engage with peers, moving in close and taking play equipment they were using. Staff recognised that this was an attempt to try and engage peers in play however peers found this frustrating.

When Manvir began using his AAC system to teach Gujarati words at news time, the class team noticed positive responses from his peers. During the Act phase, his teacher commented to the SLT-researcher that she had supported Manvir to say a Gujarati-English word pair during the class circle time. She said there was a good response from peers, so they introduced three different words. Manvir’s Dad also said his younger sister would use the AAC system with him, with their support. He made the following comments: “when we make him practice, he uses with [sister] but you know we need to be there...”.

During the Reflect stage, Manvir's teacher noticed a greater connection with the class, commenting that "it's successful because everybody is interested... It was just lovely to see [Manvir] so happy with the whole thing. I think he really benefitted from that ... and it helped to really unite him with the class".

Increased Understanding and Use of L1

Knowledge and use of L1 had been demonstrated by Manvir in some contexts at school. During the Assess phase, the physiotherapist explained how she had utilised learning assistants and orthotists who spoke the same L1 or a similar language to communicate with Manvir's mum in clinics. Of Manvir's response to this, she commented, "He thought it was pretty cool when the orthotist could speak to him". The LA who spoke Gujarati also noted that Manvir had responded to simple questions she asked him when she had worked with him in a previous class: "I used to talk to him in Gujarati, at least this thing like '[Manvir] *majama chu, how are you? Are you good?*' [And he would reply] *majama.*" In ESOL classes his teacher reported that she had used Gujarati to give Manvir an instruction to look at the screen to re-direct him, and he responded to this by doing what she had asked. In the Phase 1 interview when asked whether Manvir was stronger in one language or the other, Dad stated "I think he is okay with Gujarati and English".

In the Reflect phase, staff commented on changes they had observed in Manvir's engagement with Gujarati in the school setting using his AAC system. In the classroom, the LA who speaks Gujarati commented on Manvir as a bilingual speaker becoming more confident using bilingual vocabulary with his AAC system: "he used to find whatever he likes, and he understood both English and Gujarati, so it was kind of more comfortable for him to talk to you and others as well." Another LA expressed her observation of the significance of Manvir being able to speak Gujarati to others:

He was incredibly proud of being able to say hello to people in Gujarati and say how he's feeling that day. It was a limited range of things that he had on his communicator, but it was a beginning and just it lifted his self-confidence when coming to say hello. That was great. It helped us to learn how to say those things to him and his face would light up if he heard me giving it a go. I didn't always get it quite right, but I was getting there, and you could see in his face that he was proud to hear his own language reflected back at him.

During the Act phase, Manvir was also able to communicate in Gujarati during his ESOL class, with support of the AAC system. During the first lesson following Phase 2 planning and programming, the ESOL teacher invited Manvir to communicate something to her and the class. Manvir navigated to the pages for 'time' then 'days' and selected the day in Gujarati, then began to say the other days also. Manvir was asked if there was anything else that he wanted to communicate and he then went to the 'questions' page and said "who" and "kone" (Gujarati). The ESOL teacher commented in the Reflect phase interview "I say that to the kids all the time, 'If we don't use it, you're going to forget it.' So, same with Manvir, if he doesn't use it often then you forget it...". The ESOL teacher also commented on the increase in her interaction with Manvir using L1 related to the intervention:

I think because we bonded so well ... more so this year through your project, I think when I'm on duty or just walking around, I did used to speak Gujarati with him, but I wasn't sure whether he could understand me or not. But through your project, I actually do know that he does understand. So, it gave me the opportunity to speak a bit more (Gujarati). And he would respond so well. He'd have this huge, big smile of his and I would predominantly just speak Gujarati now whenever I see him at duty time. So, that is, again, a positive. So, it goes outside the classroom as well.

Other school staff also noticed a growth in confidence with Manvir's understanding and use of Gujarati. In the Reflect phase, the physiotherapist mentioned that Manvir often used the Gujarati vocabulary during the physio sessions. When asked whether he was using the vocabulary accurately she responded by saying:

I felt that he did and there was one situation in which he picked something (in Gujarati on his AAC system) and he actually did it for a reaction and he did it for a joke cause when I was ... surprised by what it was ... he just laughed and went to another button. So to me you have to have some understanding of what you're selecting to be able to do that.

During the Phase 4 (Reflect) observations at home, Manvir consistently used the Gujarati vocabulary when responding to questions that his Dad asked.

Dad: *Okay Manvir, I ask you in Gujarati okay?*

Manvir: 'Yes' (nods)

Dad: *How was your day?* (in Gujarati and English)

Manvir: "Khush"

Dad: *That's nice, so you're saying you were happy today right.*

Manvir: *Da-de* (spoken word 'happy').

Enhanced Child Voice

Manvir joined in the interview with his parents during the Assess phase, as well as the team meeting in the Plan phase. He listened attentively during conversation and indicated non-verbally when he wanted more information (using facial expression and gestures). During the Plan phase Manvir was involved with the SLT-researcher in programming the English buttons and made decisions about symbols for these buttons. His Dad commented that Manvir was the one who prompted them to get out the iPad and practice the vocabulary at home. He mentioned that "I would put it this way I've seen him more exciting to use TouchChat with those Gujarati words you know... he want to press all the button and say everything in Gujarati ... he proactively tells us 'let's play with TouchChat'... he was excited because he like to do that as well which is good."

During the Act phase Manvir was responsible to select the Gujarati-English words to share in class each day. Previously he had been using TouchChat to participate in maths sequences with his peers, and his teacher noted the distinction between that and using it to teach others something about his language: "...with the maths he's kind of forced to get into that particular thing ... whereas this was more 'I'm going to select it for everybody else'. It gave him a bit more autonomy... I think it was nice that it was driven by him because I think that was more engaging for him. It seemed so successful because he so enjoyed it...". One of the Learning Assistants linked his pride in his family and culture with his enjoyment of sharing that with others through his AAC system, and expressed it this way:

He's very proud of himself, his family, where they've come from and any opportunity he gets to reference something about him and his family in the general conversation with other children... So, it's important to his self-being that he gets recognised for who he is and where he comes from... it's like that when you know that people are looking at you, you feel prouder about what you're doing... he gets that confirmation people are listening to me and what I'm saying is important.

During the Act phase Manvir's skill in navigating around the vocabulary was noted by staff and his Dad. His teacher noted that, "He was very engaged with navigating to the page and actually searching for the specific word... there was definitely a purpose for his navigating of the Touch Chat." The OT also expressed that, during the Act phase, she would

ask him for help to find vocabulary on the AAC system. At school he was observed to turn the iPad around, wanting his teacher to communicate using the 'feelings' vocabulary. She chose a Gujarati word in response, and then Manvir indicated to peers to do the same. These changes were important for a child who has often been the observer and the listener to verbal students in class directing others or passing on information. His teacher commented that, "It was just lovely to see Manvir so happy with the whole thing".

Increased AAC Implementation Across Settings

One of the themes that emerged across the collaborative team was of Increased AAC Implementation Across Settings. This was seen across a range of organising themes including: Change Perceptions of AAC, Growth in Confidence Using AAC, and Increased Engagement with AAC.

Changed Perceptions of AAC

As with any team, those working with Manvir varied in their understanding and comfort levels with AAC systems. Some changes in how AAC was perceived occurred during the intervention both at home and at school.

At Home. During the Assess phase, Manvir's Dad explained that they usually understood what he was trying to communicate. He commented that "very seldom I would say he had to use that device with us. But sometimes we get stuck so then we need to give him some options." At that stage the options provided did not include the AAC system and were focused on asking Manvir yes/no questions to narrow down the information. Manvir's Dad did indicate that his preference was for Manvir to communicate using spoken communication, while also acknowledging that in many situations people could not understand him. This included family friends, as well as carers and school staff who were new to Manvir. Though the family were not using the AAC system themselves, Manvir's Dad did express openness to him using this to communicate a clear message when needed:

I mean preference is always if he can speak [and] if he can't most important thing is the message pass across right. So that's why we are here right, people in India they don't like it, that's okay. Want to make sure that whatever he needs he can, one way or the other that he need do on his own right. So we need to make sure that he's tracking along right. And I'm not that hesitant about this [AAC system] as much as I am for wheelchair for example.

During the Act phase, Manvir's Dad had engaged with him in practice using the bilingual vocabulary on a regular basis and he expressed:

... overall we all need to work more on things like this [using the AAC system]. He's currently using it but a lot more like I said in terms of playing, but if we start using it more in real usage, you know to encourage him more to use it to say actual things rather than let's have a one-hour session and you show us what you know, rather than that he actually uses it when he want to say something, he uses the TouchChat, take it out and talk about that...

Manvir's Dad had begun using the AAC system in a structured way for practice and identified that he would like to see Manvir using this for spontaneous communication. He recognised the importance of using it themselves for this to change: "I think if we continue to use it more with the other things as well rather than just for the school and for a practice purpose at home, we use it more to genuinely help him communicate, you know." In the Reflect phase, Manvir's Dad noted that "So, I think we may still need some more practice, and we continue to do that on that NovaChat, but I think it is definitely useful you know." He also considered that the AAC system was an option to use when Manvir was not able to communicate a message clearly, stating, "Because sometimes he gets stuck with what he wants to say, so those starters may at least give us a good start and say, 'Yeah, what do you want to ask is relative to that', and then he can go [to] further questioning."

During the Reflect phase had arrived, Manvir's Dad expressed his thoughts on balancing AAC and other forms of communication:

I think it's very key to his communication, but I would still put it as a moderate [rating of value]. It is important for him, but you don't want him to become too completely dependent on that. But like I said, there are situations where he gets stuck communicating without a device, then it's really important. But we want that to be a supplement to add value to the way he communicates. So, this is still important and it's a lot better than paper. Initially, we started with a book. So, it's a lot better than that. It really is important and I'm sure he's going to need that longer term at home.

At School. During the Assess phase, Manvir's teacher highlighted that she was able to understand his speech more consistently now, noting that he communicated "predominantly verbally and his conversation ... is easy to understand to those who know

him well, partly because he tends to use the same phrases ... [and] will focus on the same themes as well." By contrast she noted that during social interaction with peers, it was challenging for Manvir to engage effectively: "...you know he's clearly very social and I think that's definitely something that would be very important to him to be able to communicate more fully." In class she had been encouraging use of the AAC system in the maths routines. Incorporating this at other times had been challenging: "once I've programmed a page ... it just disappears or I find it very difficult to bring it back... it doesn't seem very user friendly." One of the Learning Assistants commented on the challenges of using AAC, for adults as well as for Manvir with his physical needs: "...it was frustrating for him when he accidentally pressed the wrong button because then you'd have to go back a few processes to get to the right button again... I'd be frustrated if nobody understood what I was doing and I was getting it wrong in front of them ... I imagine it feels the same for him, that I didn't get it right."

In the Reflect phase, Manvir's teacher commented that the intervention using the AAC system had been positive for her, "I enjoyed the experience. It was just lovely to see Manvir so happy with the whole thing." In terms of integrating AAC use in the class she identified a need for broader use with peers, "I definitely think that it's not just Manvir and the LA with him, it definitely has to be class-wide doesn't it?" In the Reflect phase, the teacher expressed her thoughts regarding how the experience could impact future work with students, particularly in terms of her allocating more time across the school day, and her evaluating the child's learning of vocabulary on the AAC system. She recognised that it needed to be integrated in this way as "an educational tool." The ESOL teacher also viewed the AAC system as important for Manvir to use as a bilingual student within the school context:

...[from] a teachers' perspective, to see the device that they use and how you can adapt that to differentiate for each learner and make it into a bilingual device as well. So, you don't need a special bilingual device, you can use what you already have... And for other students ... to know that ... different students use different resources to help their learning, and the wait time. It's not just click, click, click, click, but it's for them to listen to what he needs to say as well. So, it's all about two-way...

Other comments in the Reflect phase indicated awareness of a shift in child and adult AAC use. The LA observed that her own use of the AAC system impacted on Manvir's use, noting that "when I was using that more, he was using that more." As the OT reflected on the intervention, a similar sentiment emerged:

If we can provide students with any way whatsoever to communicate, I think we are setting them up for meaningful life... I think the more we use it, the more the child is going to want to use it. I think that's really key. We need to show them our interest and excitement... Within you, if you don't have the capacity to naturally use it then we need to put in structured times and structured activities to use it.

Similarly, the physio expressed her perspective of AAC, saying: "it's so important when you haven't got any way to express yourself, then use the tools... we want him to be independent in the world and it's no use if someone's known him for five years and understands what he's trying to say or he's trying to express, they [the child] actually need a way to express that."

Growth in Confidence Using AAC

During the Assess phase, team members experience impacted on the ways they were using Manvir's AAC system. One LA had begun developing confidence in programming the device, due to participating in training prior to the intervention.

Just like any other skill, you need to practice. So, it was really helpful to have that teacher only day and having that instruction. [Another LA] and I worked together on that day and in the couple of weeks afterwards... we were helping each other remember what we learnt because it's too easy to sit in a training session and then just forget it... any opportunity I had to sit down and just cruise through the screens to figure out oh, I can go from here to here and to get to that one. That like any other school takes practice to get any kind of fluency.

The OT expressed that during the Assess phase she was not confident in using the AAC system. She commented that, "I started to develop my confidence when the trial started. ... It does feel so unnatural. I must admit it's becoming natural for me." She noticed that her own skills in learning to use Manvir's AAC system had increased through the Act phase: "That was a pleasant experience and certainly definitely a learning experience for me. So, my learning curve tracked upwards. I was just pleased to have the opportunity to learn and get a few skills for myself." By the time the Reflect phase was reached, she was

able to find and use the target bilingual words “without difficulty... I got more confident as I got used to it, as I practiced.” The physio noted that familiarity and practice were key to developing her confidence. She also mentioned the importance of having SLT support and being informed about changes to the programming: “that’s what was really useful having you there, if I didn’t know that something had been moved from that page, it was just kind of finding where things were or what page they were on, and I think with the way that the buttons were set up I wasn’t as quick getting into it ... I feel that I would develop more skills in that.”

In the Reflect phase, Dad commented that the intervention focus on bilingual vocabulary had also increased both Manvir and his Mum’s confidence with using the AAC system:

I think it is a good experience. Like I said, it helped keep Manvir engaged in using the device. So, that is also one more good [thing]. And, for example, people like Manvir’s mum who may not be that familiar with the English words, so that helps. Without me being involved, they both can also work on the things. That is very very helpful.”

Increased Engagement with AAC

At Home. During the Assess phase, interaction at home relied on verbal communication. Manvir joined in on number sequences during physical exercises and read some words of a familiar book. He repeated words that Dad said related to the book, and answered some ‘wh’ questions (e.g., ‘Who’s he?’). The AAC system was available to the family, as it went home with the child each day, however it was not accessed during any interaction. During the Plan phase, as previously mentioned, Manvir’s parents identified important vocabulary to him, and his Dad programmed this onto the AAC system. During the Act phase, Dad practiced this vocabulary with Manvir at home, sometimes prompted by Manvir’s interest in having these interactions using AAC. Manvir’s young sister was also involved in using the AAC system with him. In the middle of the Act phase, Dad commented:

...he uses with [sister] but you know we need to be there... and make sure that they actually use it in right way, he’s asking a question and she’s answering. But then sometimes are keen to press the button so we need to do a bit of balance, you know.

During the home observation of the Reflect stage, the AAC system was used throughout the shared book interaction, as can be seen in the following excerpts from the SLT-researcher's observation notes:

Dad asked child to tell him what day it was in L1.

Child navigated to correct page and said the day in L1 accurately.

Parents smiled, Mum clapped, child smiled and made excited sound...

Dad asked child what day they would be flying out of the country.

Child selected the correct word in L1.

Dad praised child verbally, both parents smiled, and Mum clapped, child smiled and made excited sounds....

Dad and child smiled when child used 'when' correctly in L1...

Dad and child focused on device, looking for relevant question words as part of storybook reading.

At School. During the Assess phase interview, Manvir's teacher expressed that she had focused on him using the AAC system during the maths routines. She commented that she would cue the children using AAC by saying "find the months of the year" or "find the days of the week" and then rely on the LA to assist children with finding relevant vocabulary. So I'm not actually going around helping them, I'm not supporting them to do that and maybe I should.' During the Act phase, the SLT initially supported Manvir to prepare his vocabulary, and then reduced this support over time so that the cues came from the teacher, in the form of a question. The LA stood with Manvir, and provided additional support to Manvir, sometimes by repeating the word he had selected so that everyone could hear it clearly or spelling the word for the adults in the room. In the Reflect phase observation, it was Manvir who encouraged others to also use the AAC system to communicate using the bilingual vocabulary. The SLT-researcher case notes provide the following example of this:

In class (SLT and LA supporting): Manvir turned iPad/TouchChat around so teacher could see it. She came closer...

SLT: I think he's saying how do you feel...? Can you use TouchChat to tell Manvir how you feel?

Teacher: *I feel {happy HAPPY} that you're happy about going [overseas]. I think you'll have a wonderful time. But I feel {dhuki DHUKI} because I shall miss you... It won't be*

the same without Manvir. I feel sad.

Manvir had also named peers to encourage them to use the AAC system to tell how they felt. Manvir had named a peer who he was interested in hearing from. The LA heard the name and repeated Manvir's request however the first peer did not want to participate, so another peer is cued to join:

[Peer 2, AAC user]: Directed to buttons for happy and sad in English and Gujarati.

Selected *KHUSH* (happy in Gujarati).

LA2: *He's happy like you Manvir.*

In ESOL classes, Manvir had not been using the AAC system to interact during the Assess phase. During the Plan phase Manvir's ESOL teacher invited him to communicate something in Gujarati and he navigated [on AAC system] to 'time' + 'days', selected the current day, then began to say the other days also. The SLT-researcher notes also record further communication using the AAC system in the ESOL lesson, using a combination of the bilingual and general vocabulary:

The class wanted to know if he used diyas or candles, and he indicated "no" to diyas and "yes" to candles. When asked for more information about what he did for Diwali, he communicated "I eat rice". SLT directed Manvir to 'describe' page and asked him how he felt at Diwali. He selected *KHUSH* ('happy' in Gujarati).

In many of these interactions, having a staff member present who was familiar with the AAC system increased the level of engagement in using it. The physio commented: "I think one thing that was really useful was when you were also present at some of those so that you were kind of modelling both for him and for me about how to use those and how to, I think, get the most out of them [Manvir] as well. So that was really useful."

Growth in Shared Understanding

The second theme related to the collaborative team specifically, broadly identified as Growth in Shared Understanding. The first organising theme emerged during the Plan phase, when Manvir's team met together: Increased Understanding of Child Needs Through Eyes of Parents. Within this theme, two basic themes were noted: Insight into Child Safety and Partnering with Parents. The second organising theme emerged during the Plan phase and continued into the Act phase: Enhanced Collaborative Planning of AAC Needs. Within this, four basic themes were identified: Shared AAC Planning, Communicating with Parents, Communication with School Staff, Increased Reflection regarding Integrating AAC.

Increased Understanding of Child Needs Through Eyes of Parents

The organising theme of Increased Understanding of Child Needs Through Eyes of Parents was further analysed into two basic themes – Insight into Child Safety and Partnering with Parents.

Insight into Child Safety. As previously mentioned, during the Plan phase meeting, Manvir’s parents shared their concern that he could not currently let others know when he was hurt, or if someone else had hurt him. Manvir’s Dad explained that he checked with his child daily about his day, including asking whether there had been any “bad touch”, either at school or in the taxi ride. Most of the team members have regular contact with parents, including at IEPs and this communication need had not been raised by parents prior to the AAC planning meeting. The child’s Dad expressed this need as a priority to include in the bilingual target vocabulary for the intervention. During the Reflect phase, Manvir’s Dad rated as ‘high’ that the words chosen for the AAC collaboration were important to his child.

All team members commented on the impact of hearing from parents regarding the child’s well-being and safety. One of the staff expressed that it was ‘heart-breaking’ to hear this concern from parents. Another recognised that teaching the child to use “negative words as well as the positive” became a new aspect to think about. The OT participant commented that:

It also opened up ideas that I didn’t think about [regarding Manvir’s] communication, for example the safety aspect. That was very clear in Dad’s mind... We’re actually working beyond just social communication, we’re actually working about safety in life. This is somebody who doesn’t communicate very well, and these are important things.

This insight was also expressed similarly by one of the Learning Assistant’s in Manvir’s team, who was impacted by parent voice regarding safety and well-being for their child:

... I knew that [regarding Manvir’s vulnerability] on an intellectual level, but in that meeting I got to hear it on a very personal level from their perspective. It’s all very well saying he needs this, he needs that, but I’m just working with him [at school]. They love him entirely and want a good future for him and they want anything they can get to help him negotiate the world in front... It was a little bit heart breaking to hear them say what they needed, but it was understandable.

Partnering with Parents. Staff members commented further about the importance of parents hearing day to day communication from their child about what happens at school. One LA commented that hearing this gave her a role in supporting this communication:

From that meeting, it meant that I met his parents and they felt okay to come and talk to me directly because they knew I was spending the large part of my day with him, and I felt okay to be able to say, 'Yes, he had a great day today,' or, 'We went swimming. He loved it.' That kind of thing. It became a real comment rather than just a token comment because they knew that I had spent the time with him... I really liked meeting them.

The physio expressed the emphasis of partnering with parents and children in goal setting:

...looking at that kind of partnership and ... what's the parents' priority and how do we help them and how do we support them... it's reinforced ... how important the parents and the student are in what we are doing and what their goals are and why we are providing therapy or input with them.

Importance of Manvir and his family's language was also seen as key by team members. family in talking about L1 was noted in the Assess phase interview and during the Reflect phase another staff member noted that:

... we don't often get the opportunity to get down to the nuts and bolts of what's really important to a family and how we can adapt our practice so having that opportunity and being involved in that opportunity to be able to use bilingual within our therapy I think it's been great... I think just that awareness of that option of them [students] choosing what language they can communicate to us in... and how we could actually use it more just within every day practice ... I think that to me it's also I think given some value to some of our staff members that speak those languages... and ... giving those staff opportunities to 1) use their language, and 2) help teach us and educate us in that...

Enhanced Collaborative Planning of AAC Needs

The theme of Enhanced Collaborative Planning of AAC Needs was organised into three basic themes of Shared AAC Planning, Communicating with Family, and Communication with School Staff.

Shared AAC Planning. During the Assess phase and prior, the only Gujarati words loaded onto Manvir's AAC system had related to a few food items that he brought to school with him. During the Plan phase, the team discussed the L1 words which would be the most important for Manvir to have access to for his communication needs. The priorities discussed during interviews in the Assess phase were shared, and those which held the greatest value for Manvir's parents were agreed on. During this meeting, all Manvir's family were present, and Manvir was part of the conversation. The SLT-researcher addressed him during the conversation, and he affirmed agreement (using *yes* or *mm*) with what others expressed as being important.

Following the team meeting, the SLT-researcher carried out programming with Manvir's input for symbols and organisation of the buttons. When requesting, Manvir's Dad carried out programming, usually within the same day of the request. An example of the communication related to this, included the following: "programmed names for weekdays on the second page under 'Time' option. I've used English name as an image so it is clear. Feel free to change it if you like."

Communication with Family. Following the Plan phase meeting, communication with family primarily occurred through email. These included requests and responses regarding programming needs, suggestions for practice of vocabulary, and information about what school staff were doing to practice the target vocabulary. During the Act phase, ongoing planning included communication about having single icons or phrases on individual buttons, with parent consensus being that focus on the single words was right for Manvir initially. Near the end of Term 4 2020 (Act phase), a review of the timing of the project took place, and the decision was made to extend into Term 1 of 2021 to consolidate learning. Manvir's Dad responded to this decision saying, "Thanks for extending the practice phase. Hopefully once we move next week then we will have more time." The following suggestion was emailed to Manvir's Dad and copied to the school team, to provide additional support and focus for the practice sessions in the week ahead:

Email from SLT-researcher to parents, copied to team:

Thanks so much, [Dad]. Just thinking about ways to consolidate our practice together:

'Question page: If you could focus practice on Manvir learning the 'question' words this weekend, that would be great. You could practice finding them first (e.g., tell me

'where' in Gujarati), and then practice using the talker when you ask a question during a story e.g., 'where' (push 'where' in Gujarati) is the goat going'.

I've put another Gujarati/English book in Manvir's bag - 'The Three Billy Goats Gruff', which you could use to practice the 'wh' questions.'

In the Reflect phase, Manvir's Dad expressed that he had felt supported to carry out the intervention, including receiving input from school staff: "We discuss a few options and some of the things like basic things, reading a book and things like that, he can do good... I think in terms of ideas, we discussed a lot of things you know." In this interview his Dad also commented regarding home-school communication, saying:

You always ask which is good, because when you don't know the best thing is to ask. And you have asked us always, kept us informed of what you're doing. So, I think this is a good approach. I'm happy with that.

Communication with School Staff. Across the school team, communication occurred face to face, through conversations and shared lessons. This included the SLT supporting practice in class or during OT shared reading sessions and providing feedback when requested. Adaptations were made to planning through informal conversations during the school day. One example of this was the SLT checking in with the teacher to see if she would like to extend practice to other times of the school day. The teacher expressed that she was happy with what was happening already and thought it was going well. After conversations with team members to clarify when they could focus on practice with Manvir, the following was sent to his parents and the school team, summarising the plan:

- At news time next week Manvir will have the opportunity to tell his friends a Gujarati and English word most days. I will support Manvir with this.
- [OT] is planning to practice these in story time.
- [ESOL teacher] is planning to practice the Gujarati 'wh' words in her ESOL class.
- I will continue to practice the 'describe' page words also and will look for opportunities/activities to practice these for the following weekend/week.

Thanks again everyone.

When the second LA joined the team, she entered in the middle of the intervention. While this could have been challenging for her, she reported that she found everything in place so that she could commence her involvement:

It was like, you have already set up everything on the TouchChat and ... I didn't have

to ... put everything over there and you put, like Gujarati and English, so for him and me it was very easy to communicate ... It was kind of very good. But ever since I started [in] the room and I was with him and I saw that he was more comfortable with using everything... in the morning even like when you asked what you going to talk today about and then he used to... [be] more kind of ready to go. We don't have to prepare him.

Increased Reflection Regarding Integrating AAC. The classroom teacher reflected that she intended to use the question words with the child following playtimes, so that he could practice questions such as "Where had you played in the playground?" or, 'Who did you play with?' however she commented that this did not happen during the busy re-entry into the classroom. She identified strategies she could use in future, such as noting the words on the whiteboard so that she could use these in general conversation. She also recognised that her physical position in the class was important to support AAC use, in the following reflection:

... maybe I need to ... stand with Manvir and speak to the class from [his] position really. Cause otherwise ... I haven't actually got the TouchChat in front of me or the NovaChat in front of me have... I'm kind of relying on a LA to do it.

Manvir's Dad also expressed that he would like to have done more practice in everyday situations. During the project the family had moved to a new house and then were planning to move to a new country, and he expressed that this had obviously impacted on time to practice.

Chapter 5: Discussion

The aim of this research was to contribute to the AAC literature and inform practice related to providing collaborative and culturally responsive intervention for dual language learners who use AAC. The study specifically focused on the outcomes of home-school collaboration and use of dual language strategies on AAC engagement. Relevant existing literature includes knowledge regarding effective collaboration with parents and children from CLD backgrounds. Also important is understanding the literature regarding dual language acquisition, strategies to increase engagement with AAC, and the integration of these knowledge areas for children who are dual language learners and require AAC. While commentary exists in the literature regarding culturally responsive AAC practice, there have been few studies that have explored the effects of this through collaborative intervention at home and school.

The results of the study identified positive outcomes for the child, and for the collaborative team. The global themes for the child of Enhanced Communication Clarity through AAC and Enhanced Child Voice are discussed in relation to relevant literature. The global themes for the adult participants of Increased AAC Implementation Across Settings and Growth in Shared Understanding are also discussed.

Enhanced Communication Clarity through AAC

Within the global theme of Enhanced Communication Clarity of Child through AAC were three organising themes: Increased Engagement with Peers, Increased Use of Target Words, and Increased Understanding and Use of L1. These two latter themes have been integrated due to the overlap between the target words and understanding and use of L1.

Understanding and Using L1

In CLD communities, developing AAC skills that are culturally relevant and integrate the child and family's L1 is essential (Mindel & John, 2018; Soto, 2018). There is evidence in the literature for intervention being provided in L1 and L2 for dual language learners with language learning needs (Perozzi & Chavez Sanchez, 1992; Seung et al., 2006; Thordardottir, 2015). As has been stated, research regarding culturally responsive AAC intervention is limited (Mindel & John, 2018). Prior to the current case study, Manvir's AAC system had English words only and no intervention had been carried out which included L1. As part of the current intervention, L1 vocabulary was identified and programmed onto the AAC system by Manvir's Dad. Having access to L1 on his AAC system increased Manvir's

opportunity to communicate clearly using L1 at school and at home. As a result of this access, increased understanding and use of L1 was demonstrated.

Engagement with L1 at School. It is well understood that supporting children's learning through engagement with L1 is good practice (Baker & Wright, 2017; Creswell & Miller, 2000; Cummins, 2000). As has been stated previously, progress in L1 is linked to academic progress (Cummins, 2000), with increased combined vocabulary, and with emotional well-being (Baker & Wright, 2017). For Manvir's school team, they observed that the increase in vocabulary using L1, together with benefits to his well-being. As a result of the intervention, Manvir's ESOL teacher began speaking with him more in the playground with L1 and noticed him smile in response to this. Within the ESOL class, Manvir's teacher gave him opportunity to communicate in L1 using his AAC system. Using his AAC system, Manvir was able to demonstrate his knowledge of L1 within the school context. Manvir's class team observed that he showed pride and enjoyment in sharing his language at school. This finding aligns with literature related to progress in L1 being linked with increase in emotional well-being (Cummins, 2000; Paradis et al., 2003). Valuing and using L1 within the school context is mandated within the Ministry of Education's Four Year Plan (Ministry of Education, 2019a) and addressing the language needs of children who use AAC need is equally important in this directive.

While we know dual language focus is important, children who use AAC face participation barriers relating to the use of L1 in the school context. Collaboration between home and school can reduce the barriers (Beukelman & Light, 2020; Mindel & John, 2018). The findings in the study support the literature by demonstrating that it is feasible to integrate L1 use on AAC systems. Collaboration to provide this vocabulary can result in learning and use of L1, along with increased participation at school (Beukelman & Light, 2020; Mindel & John, 2018; Soto & Yu, 2014). A small selection of vocabulary was the focus of this intervention, and further collaborative work is needed to extend this with Manvir and other children. Manvir's ESOL teacher commented that children often take time to develop confidence in using L1: "it will be the same with Manvir I think. This is just the first step, but I think it's a great thing that we've done".

Using L1 at Home. As discussed previously, Soto & Yu (2014) advocate for a sociocultural approach to language learning. In this approach, language is provided based on what is required to engage in meaningful ways within natural cultural contexts (Soto & Yu,

2014). In this study, increased L1 use was noted in the home context through the collaborative intervention. Language that was meaningful to Manvir and his family was selected for the AAC system (Mindel & John, 2018). In the Reflect phase of the intervention, Manvir showed preference for using the L1 vocabulary programmed onto his AAC system when communicating with his parents. Manvir's dad explained that having L1 on the AAC system also created opportunity for Manvir's mum to interact with him, without needing his support. This was important because Manvir's mum communicates with him in L1 and has minimal skill in English. When Manvir used L1 on the AAC system, both parents showed positive responses to his communication, smiling, and clapping at his use of their language.

This finding supports current commentary in the literature regarding the need to prioritise integrating L1 on AAC systems for Manvir and other dual language learners using AAC (Beukelman & Light, 2020; Mindel & John, 2018; Soto & Yu, 2014). This is important as having a shared language helps to build social closeness, as has been seen with Manvir and his mum (Cummins, 2000; Paradis et al., 2003).

Increased Engagement with Peers

Communication occurs within social contexts, and for Manvir an important context was interaction with class peers. Provision of L1 on Manvir's AAC system provided opportunity for increased connection with his class peers. Prior to the study, staff observed that Manvir often used his body to get the attention of peers, moving in close and taking their play equipment. Peers responded to his attempts to engage with them with frustration. When Manvir began using the Gujarati words on his AAC system, peers were interested and responded positively. This use of AAC to share information with peers and connect with them can be considered with reference to Janice Light's (Light & McNaughton, 2014) model of communicative competence. Manvir was able to use the AAC system to communicate in both languages (linguistic competence), to connect with others (social competences), by accessing vocabulary on his system (operational competence). With targeted practice through the collaborative intervention, progress was observed in his ability to communicate socially in everyday contexts using his AAC system (Light & McNaughton, 2014). His teacher noted that during the intervention he was very intentional in his communication using AAC, navigating to the vocabulary he wanted (operational and linguistic competence), and showing enjoyment in sharing his language with peers (social

competence). The increased communicative competence displayed by Manvir resulted in the benefit of increased social connection with his peers.

Enhanced Child Voice

The rights of children with communication needs to have their say in the services they receive is fundamental (Doell & Clendon, 2018). Foundation documents support this right internationally, including The Universal Declaration of Human Rights (United Nations, 1948), The United Nations Convention on the Rights of the Child (1989), and The Convention on the Rights of Persons with Disabilities (2006). In New Zealand, the Disability Strategy (Ministry of Social Development, 2016) exists to represent the voices of people with disabilities. In the current study, Manvir's participation was a priority from the beginning. During the recruitment phase of the research project, Manvir and his parents discussed the opportunity to be involved together. Manvir gave verbal consent to his parents. Further opportunity was given for Manvir to talk about the project with the SLT-researcher. Prior to signing his consent form, Manvir was asked by the SLT-researcher if he was okay to sign or wanted more information. Manvir indicated he wanted more information, and this was given until he had sufficient understanding of what would take place and was ready to consent. This prioritising of child voice was an important ethical aspect of the study.

In addition to being part of the interviews and the team meeting that took place, Manvir demonstrated increased advocacy for use of the AAC system. This unanticipated finding was observed at home and at school. Manvir's dad reported that it was Manvir who would cue him to get the AAC system out of his bag so that they could interact using the L1 vocabulary. At school, Manvir selected the L1 vocabulary to teach students during the news time. In the final observation of the Act phase, Manvir invited others to use his AAC system by turning it around to face them, or by saying their name. Light & McNaughton (2014) discuss the psychosocial competency required for effective AAC use including the aspects of motivation and attitude. Manvir was motivated to participate in the study, and to engage others in using the vocabulary at home and school. Current literature regarding the rights of children with communication needs to advocate for themselves concurs with this finding (Beukelman & Light, 2020; Doell & Clendon, 2018; Soto & Yu, 2014).

The findings of the study related to the focus child resulted from specific intervention by the collaborative team. For the team there were also effects that occurred from the work completed together. These are discussed in the following section.

Increased AAC Implementation Across Settings

The organising themes identified in the study of Growth in Confidence Using AAC and Changed Perceptions of AAC are discussed in relation to the literature focused on building skills and confidence of adult communication partners.

Growth in Confidence Using AAC and Changed Perception of AAC

There is evidence in the AAC literature regarding the importance of training communication partners in using AAC (Goosens, 1989; Kent-Walsh, Binger, & Malani, 2010; Soto, 2012). As has been stated previously, without training and support, adult communication partners tend to provide few opportunities for children to use AAC (Kent-Walsh, Binger, & Hasham, 2010). To become competent communication partners, adults require specific skill training and meaningful learning opportunities to become comfortable with using an AAC system (Goosens, 1989; Kent-Walsh, Binger, & Malani, 2010; Soto, 2012).

During the current study, one staff member expressed how unnatural it felt at the start to use the AAC system to communicate. At the end of the project, most team members commented on their increased confidence. As with any team, the factors that impacted their confidence varied – having set times to use the AAC system with Manvir, having SLT support to locate the target vocabulary, reflection on the impact of modelling on child use, and having the vocabulary programmed in advance for them to use. Other aspects commented on occurred prior to the project - specific training regarding programming, and opportunity to practice. These aspects concur with the literature related to building communication partner skills (Kent-Walsh, Murza, Malani & Binger, 2015). The current study aligns with other AAC literature which indicates that modelling skills and strategies, and use of guided practice, results in positive outcomes for communication partners.

The OT who commented on how unnatural it felt to communicate with AAC in the Assess phase, noted in the Reflect phase that it was becoming natural– an important outcome both in increased comfort levels and in skill development. Other comments also reflected a change in perception regarding using AAC to engage peers, and as a learning opportunity for peers as communication partners. The ESOL teacher noted that peers needed to learn to wait for Manvir to find and communicate his message. Manvir’s teacher commented on the need for class-wide use of the AAC system, and the team members all recognised their own areas for further skill development. These changing perceptions appeared to be closely connected with building confidence in AAC use as discussed in the

literature (Kent-Walsh, Murza, Malani & Binger, 2015). They also align well with the domain of psychosocial competence explained by Light & McNaughton (2014) which highlights the importance of having a positive attitude, developing confidence and increasing resilience in AAC use. While Light and McNaughton's (2014) definition is considered in relation to people who need AAC to support their communication, this could also be applied to the communication partners who are developing skills to support them.

Growth in Shared Understanding

Within the findings related to growth in Shared Understanding were the themes of Increased Insight into Child Needs Through the Eyes of Parents and Enhanced Collaborative Planning of AAC. These are discussed in relation to the literature related to parent engagement in intervention, and collaboration.

Increased Understanding of Child Needs Through Eyes of Parents

When forming collaborative teams, the importance of hearing parents' perspectives has been clearly stated in the literature (Brassart et al., 2017; Macfarlane, 2015; Watts Pappas et al., 2009). Much of the current research regarding collaboration points toward family-focused intervention (Brassart et al., 2017; Klatte et al., 2020; White & Spencer, 2018). Klatte et al. (2020) summarise key components as: establishing a reciprocal relationship, working towards shared understanding, and aligning intervention with parent priorities. For children who use AAC, collaboration starts with identification of skills and needs in the context of everyday communication, with the child and parents at the centre (Beukelman & Light, 2020). During the Assess and Plan phases of the current project, Manvir's parents were given opportunity to talk about his communication skills and needs. They openly expressed concern regarding Manvir's need to communicate if someone had hurt him, and to share information across home and school. All staff reported the impact of hearing parent voice regarding Manvir's needs, and this gave important collective insight to the intervention. Identifying and focusing on parent priorities through collaboration increases effectiveness and aligns with the literature related to SLT service delivery and AAC intervention (Watts Pappas et al., 2009; White & Spencer, 2018; Woods et al., 2011).

Even with recognition of Manvir's significant communication challenges, Manvir's father rated the AAC system as having "moderate value" for Manvir. He expressed that he did not want Manvir to become too dependent on the system. He also commented that having an AAC system which used technology was a "lot better than paper" and expressed

that he wanted to ensure that Manvir could communicate independently. These insights are important in understanding parents' readiness to engage with AAC. Evaluating and building on confidence and competence of communication partners is an important focus of any intervention (Beukelman & Light, 2020; Kent-Walsh, Binger, & Hasham, 2010). Prior to the research project, Manvir's parents had been happy for the AAC system to be used in school but had not seen a need for it to be used at home. Through parent involvement with goal setting and participating in the intervention, changes were noted in parent engagement. As with child communicative competence, this is a progression and exploring the capacity and skills of parents as communication partners is essential (Beukelman & Light, 2020).

Enhanced Collaborative Planning of AAC Needs

Within the findings related to collaborative planning were increased shared planning and increased communication related to planning. The basic themes of Communicating with Family and Communication with School Staff have been merged to discuss communication within the collaborative team. These findings are discussed in the following paragraphs.

Shared AAC Planning. During the Assess phase of the intervention, team members expressed frustration with Manvir's AAC system in relation to programming, difficulty finding vocabulary, and Manvir's speed of access. At that point, the AAC system was used most consistently for specific maths and literacy activities in the classroom, and parents did not feel the need to use the AAC system at home.

During the Plan phase, time was specifically set aside to meet and discuss Manvir's communication skills and needs and how his AAC system could be used to meet these. In the meeting, shared conversation took place regarding parent priorities, as mentioned previously. A collaborative plan was developed and involved selecting specific vocabulary for all team members to focus on. In the planning meeting, team members also identified when they would use the vocabulary with Manvir.

During the Reflect phase, parents and team members noted how valuable it had been to meet. The literature regarding AAC highlights several barriers to use, including lack of time to meet with teams (Baxter et al., 2012; Watts Pappas et al., 2009), challenges with using the AAC system, and how well the team work together (Bailey, 2006). The current study aligns with the importance of overcoming these barriers through effective collaborative practices, including setting time to meet, identifying shared priorities, and problem-solving when challenges arise. The results indicate that with increased shared

planning, and ongoing team support, the impact of common barriers for AAC teams can be reduced.

Communication within Collaborative Teams. Respectful communication that values others' contributions is essential for any team to be effective (Macfarlane, 2015; Ministry of Education, 2019b). In practical terms, this can be demonstrated in team meetings where each person is invited to share their perspectives and feels comfortable to do so. Reflective listening can also be used to clarify what has been said, and to provide opportunity for ideas to be expanded further (Ministry of Education, 2019b). The findings of the current study demonstrated positive results in communication across the team during shared planning. In the example of the team meeting during the Plan phase, team members were each invited to share their knowledge of Manvir's communication, and to highlight possible areas to focus on together. When Manvir's parents expressed their concerns during the meeting, the response of team members towards them appeared warm and heartfelt, displaying manaakitanga and whanaungatanga.

Following the planning meeting, the plan that had been agreed together was shared with all team members, and opportunity given to provide feedback or suggest adjustments. Through all the phases of the project, the SLT-researcher communicated with team members regularly, clarifying expectations, and checking where support was needed. This resulted in positive outcomes related to increased collaborative planning. This focus on regular communication aligns with parent perspectives in the literature regarding the need to receive good communication regarding service, and to be supported with engagement in AAC (Baxter et al., 2012; Moorcroft et al., 2020).

Concluding Comments

AAC assessment and intervention that is culturally responsive is crucial and there is growing understanding in the literature regarding what this involves. It is important for AAC teams to use current knowledge and resources to bridge the gap to provide for dual language learners using AAC. Manvir's ESOL teacher commented on the broader implications of L1 access for dual language learners saying, "I think what you're doing has opened up an avenue for hopefully a lot of other children, but especially for Manvir and his family... no matter where they go... it's not [only] within our school context, it is beyond that I think." Rather than needing to wait for an AAC system that suited his language needs, the ESOL teacher also noted that "...[from] a teachers' perspective, to see the device that they

use and how you can adapt that to differentiate for each learner and make it into a bilingual device as well. So, you don't need a special bilingual device, you can use what you already have...".

The concluding paragraphs will explore the strengths, limitations and challenges of the current study, and practical implications for professionals.

Strengths

To ensure trustworthiness of the study, steps were taken to ensure credibility, transferability, dependability, and confirmability of the data (Mills, 2014).

Trustworthiness. Credibility of the study was achieved through triangulation of data (including video and audio recording), peer review throughout the study, and member checks. Analysis of data was also discussed with and cross-checked by university supervisors to ensure development of codes and themes was logical. Provision of detailed description within the methodology chapter allows for transferability of the intervention to future studies in similar contexts. Comparison of data across sources (interview transcripts, observation videos, case notes) and participants contributed to the dependability of the findings. Confirmability was established through triangulation and reflexivity. The SLT-researcher recorded a journal of reflections throughout the project.

Limitations and Challenges

Several factors impacted on the current study, including the effects of COVID-19, and the challenge of AAC system breakdown. Manvir's family had additional challenges of moving to a new house and moving to a new country, along with facing increased health management for Manvir. The latter also required prioritising of therapy input for school staff. These limitations and challenges are explored in the following paragraphs.

COVID-19. The current study was due to begin at the beginning of term three 2020. COVID-19 restrictions occurred in the first and second terms requiring children and staff to remain at home. This resulted in the research project commencing in term four 2020. During terms three and four 2020 and term one 2021 there were further restrictions for periods of time, which impacted on the ability to meet as a team, and reduced access to ESOL classes. While the impact locally and nationally differed from what occurred on an international scale, unanticipated and challenging effects were experienced by all participants. Together these factors resulting from COVID-19 caused delays in beginning and completing the intervention.

AAC Systems. Prior to commencement of the study, Manvir's AAC system (NovaChat) became faulty and was returned to the supplier for repairs. As the supplier was based overseas, the timeframe of repair and return was longer as an impact of COVID-19. The outcome of this was that Manvir and his team were required to use another AAC system (TouchChat with WordPower) which was like the NovaChat WordPower setup. Prior to commencing the current study, the SLT-researcher also investigated AAC options that might be available in the child and family's L1. The Avaz app was explored as this provides access to many Indian languages however at the time did not have Gujarati as a language available. As there was no bilingual AAC system identified, the decision was made to use the current AAC system, and to integrate target L1 vocabulary into this.

Considerations for Manvir. During the project, Manvir, his parents and team were faced with needs related to his physical health, requiring increased consultation with hospital staff and monitoring of eating and drinking safety. This priority, along with changes in therapy and classroom staff during the project, necessitated that time which could have been spent on the intervention was focused on training and monitoring health needs. Further to this, Manvir's family moved home twice within the time of the study – once within the same city, and then to another country. This impacted on the time that Manvir's dad had available to practice the L1 vocabulary with him, as well as affecting opportunities to support this with the family. The family's move overseas resulted in the project being shortened slightly, and the Reflect phase happening more swiftly than had been planned.

Implications for Practice

Within the findings of the current study, two key areas stand out as important for AAC teams – engaging in shared planning to integrate L1 into children's AAC systems, and on-going development of cultural competence of individuals and teams.

Shared Planning for Integration of L1. Creating meaningful opportunities for children who are dual language learners and use AAC requires a focus by collaborative teams. Consideration of L1 needs must take place from the outset of assessment, and integration of L1 vocabulary needs to be incorporated in implementation plans (Soto & Yu, 2014). Time is a challenge of all AAC teams and continuing to identify and integrate L1 vocabulary based on the child's need is significant. Opportunities need to be identified within AAC team planning to target specific language skills across home and school situations to maximise learning. Manvir's ESOL teacher commented that for dual language learners: "you give them multiple

opportunities, so it's not just [a] one-off time, but give them multiple opportunities to use their skills in different settings". This is true of any language learner and the literature, including the current study, states the importance of ensuring this is the experience of dual language learners who use AAC.

Within the current study, shared planning occurred within one specific meeting (approximately 45 minutes) where vocabulary and times to use this with the child were agreed. Coordination across home and school was facilitated by the SLT-researcher. The child's current AAC system was programmed with the L1 target vocabulary with support of the child's dad. This focus on L1 seemed to result in increased engagement with the AAC system at home and school, which is an important goal of any AAC team and good use of collaborative energy.

Cultural Competence. Solomon-Rice and colleagues (2018) highlight the importance of cultural awareness for the professional providing AAC service. The SLT-researcher did not share the same L1 as the family and had limited knowledge of their family culture. Opportunities were taken during the Assess phase to learn from the family as experts in their own culture and language. Much of the initial interview with family was focused on gathering information about cultural and family events and language important to them. At times, questions were asked of staff members from the same cultural background to gather further insight. Developing knowledge through professional learning and culturally knowledgeable others is important to ensure ongoing, safe, and culturally responsive AAC practice and this is the responsibility of all (Robinson & Solomon-Rice, 2009). When Manvir's Dad was asked for recommendations of how the SLT-researcher could work with families in future, he simply recommended to ask families what was important in relation to their culture. He noted that there can be variation in the ways people celebrate and cultural values they hold therefore checking with individual families is essential.

Final Thoughts

The findings of this study indicate that home-school collaboration and dual language strategies can enhance AAC use by children and their communication partners. The themes discussed in relation to the literature were increased understanding and use of L1 and strengthened child voice (for the child participant), and growth in AAC implementation and in shared understanding (for the adult participants). While the details of the intervention were specific to the child, the process for the intervention followed an Inquiry framework (Assess,

Plan, Act, Reflect) outlined in the methodology, which could be replicated in other similar settings. Further investigation in this area is essential to provide needed evidence and guide teams to engage in culturally responsive AAC practice. It is the right of children who are dual language learners and require AAC to learn the languages they need to participate in any context, and to have their voices heard in those languages through any modality.

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Appendix A: Principal letter



Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration

Information Sheet for School Principal

Dear [Principal's name],

As you are aware, I am currently enrolled as a student in the Masters of Speech and Language Therapy programme at Massey University. My study interest came about because so many students I work with communicate at home with their family's first language and are then required to learn English when they begin school. I have been learning about supports to help children to learn both languages together (dual language learning strategies), when they also use communication devices, like the NovaChat and TouchChat apps. This year I would like to carry out a research project to explore how to use dual language strategies with one student who uses a communication device through home-school collaboration.

I would like you to consider this research project being carried out at [school name]. Benefits to the participants and school will include shared learning from each other throughout the course of the project, and a summary of the outcomes of the research.

The Project Plan

The project will involve working with one child, their family members, and their school team (teacher, learning assistant, ESOL teacher, school SENCO, occupational therapist, physiotherapist, and speech language therapist/researcher). A cultural advisor will also be identified to carry out an interview for cultural and language knowledge and, if required, to interpret during interviews and translate written information. The project will involve four phases and take place across 1-2 school terms.

- Phase 1 (2-3 weeks): Assess - Explore the child's current communication skills at home and school through interviews (45-60 minutes) with the child, parents and school staff, observations of the child's communication in each place (10-15 minutes on 4 separate

occasions for one week, using video recording and case notes), and reviewing school documentation – Individual Education Plans (IEP), assessment data, case notes, and device data. Interview cultural advisor to gain additional information regarding family language and culture.

- Phase 2 (2-3 weeks): Plan – Meet together as a team to develop a plan using dual language strategies (45-60 minutes). This may involve selecting important vocabulary and phrases in each language, identifying language learning strategies, and programming the communication device with new vocabulary.
- Phase 3 (4 weeks): Act - Put the shared plan into action during agreed times, both at home and school with regular SLT/researcher support.
- Phase 4 (2-3 weeks): Reflect – Evaluate the action plan, and the team’s experience of the project through follow up interviews (45-60 minutes) and observations of the child’s communication in each place to observe any changes (10-15 minutes on 4 separate occasions across one week, using video recording and case notes).

I plan to carry out the interviews and observations as part of SLT service delivery, to inform my work with the child, family, and team. Analysis of data and other requirements of my thesis will take place outside of work time, unless arranged with you.

Contact Information

My supervisors for this research are Dr Sally Clendon (S.Clendon@massey.ac.nz; Ph: 09 4140800 X 43537) and Dr Elizabeth Doell (E.H.Doell@massey.ac.nz; Ph: 09 414 0800 X 41488). You are welcome to contact them to discuss this project.

Additional Information

- When videoing, I will ensure everyone involved is comfortable. I will stop immediately if any participant shows reluctance to continue, or the household or classroom is disrupted by my presence.
- Participants may withdraw from the study at any stage up until two weeks after the phase 4 interview.
- The information gathered (through interviews, observations, video recordings, emails related to the project, meeting notes, IEP documentation, case notes of observations or conversations, and previous and current assessment data) will be analysed by myself, in consultation with my research supervisors.

- The results of the study will be presented in my Masters' thesis and may be published in journal articles or presented at conferences. The data collected will be kept anonymous in publications or presentations about the project. There is a risk that participants may be identifiable to others within the [school name] community given that the study is small and focused within the [syndicate name]. Additionally, my association with the school creates a risk of people being able to identify the school within the wider community or through an internet search.
- Any information will be stored on password protected computers or in a locked filing cabinet in Dr Clendon's office. The only people with access will be myself and my supervisors. Consent forms will be stored separately. Information will be kept for 5 years after the completion of the final publication. When disposed of, the University confidential waste service will be used.
- At the conclusion of the study, I would like to meet with you, and the school team, to talk about the findings. I will also provide you with a written summary.

Ethics Approval

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application NOR 20/05. If you have any concerns about the conduct of this research, please contact Dr Fiona Te Momo, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 43347, email humanethicsnorth@massey.ac.nz.

Thank you for considering this request. Please let me know if you would like to discuss this project further.

Meryl Bowen

Master's student

Appendix B: Phase 2 Project Plan

Manvir's Bilingual Words + Phrases Plan

Research Project Phase 3

Vocab: words/phrases/categories	Times to practice	Possible Resources/Strategies
<p>Communicating needs:</p> <p>About his body:</p> <ul style="list-style-type: none"> - feeling hungry/thirsty, sick, tired, or sore - toilet (“pee”) - there’s a “problem” - “bad touch” - names of body parts. 	<p>Parents:</p> <ul style="list-style-type: none"> - on arrival home from school - during exercises/walk to park <p>School staff:</p> <ul style="list-style-type: none"> - news day (LA/teacher) - OT/SLT sessions (weekly) - physio exercises 	<p>Bilingual pages for: body parts, feelings (description pages + zones of regulation resources red, green, yellow zones/flags).</p> <p>iPad with TouchChat pages</p> <p>Printed book/pages</p> <p>TIP bilingual chart for key words/phrases</p> <p>Flow-chart for asking questions of Manvir (to find out news)</p> <p>Sharing photos/video of key events and lessons.</p>
<p>Communicating information/opinions:</p> <ul style="list-style-type: none"> - passing on information across places, what 	<p>Parents:</p> <ul style="list-style-type: none"> - on arrival home from school - during story reading 	<p>Bilingual pages for: daily schedule + activities vocab (home and school).</p>

<p>he's done (people, places, activities/things).</p> <p>- practicing answering 'wh' questions: who, what, where, when, why.</p>	<p>School:</p> <ul style="list-style-type: none"> - news day (LA/teacher) - mainstream time with LA/peers - OT/SLT sessions (weekly) - Reo Haumako (ESOL) classes: 'wh' questions. 	<p>iPad with TouchChat pages</p> <p>Printed book/pages</p> <p>TIP bilingual chart for key words/phrases</p> <p>Flow-chart for asking questions of Manvir (to find out news/information)</p> <p>Sharing photos/video of key events and lessons.</p>
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Appendix C: Guiding Questions for Parent Interviews

Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration: Guiding Questions for Parent Interview - Phase 1

Culture

- What are some of the festivals that are important within your cultural group/community? How do you celebrate these?
- What are the other occasions or special ways of celebrating as a family?
- How does religion form part of your family life? What practices/rituals are important to you? How are they similar/different to the cultural/community practices?
- What are the important places within your culture/community/religion?

Family/community

- In your community how are family relationships described/understood? What are important relationship terms? (e.g., of aunty/uncle with non-family members who are older; terms of respect for anyone older than yourself, or way of greeting/honouring such as touching feet of elders)
- What are some of the special terms for recognising/honouring family members?
- What roles do children have in your family/community?
- How do children participate in community/religious festivals/events?

Language experience

- What languages do you speak/understand? How comfortable are you communicating in [each language, including English]?
- What languages are spoken by your wider family/community?
- How does Manvir respond to your family/community languages? What (common phrases, religious terms, instruction language) does Manvir respond to?
- Does Manvir use any words/signs/symbols to communicate in your family/community language?
- When was Manvir first in an English-speaking environment? How much time was he in that environment?

- Do you have a sense of your child's language skills in each language – strengths, preferences?

Communication modes and needs

- What ways does Manvir communicate with you? (May have been discussed above)
- Does Manvir communicate in similar ways with others in your family/community?
Who with?
- How does Manvir participate in religious festivals/events?
- Are there ways you would like Manvir to participate in your family? ... in festivals/events?
- What communication skills would you like to teach Manvir?
- What would you want Manvir to be able to do by the time they complete primary school?
- What are Manvir's strengths/interests?
- What are the benefits and barriers of using NovaChat/AAC?

Perceptions/approaches

- What are the good ways that your culture/community responds to communication differences?
- Are there any hard things about how your culture/community responds?
- What communication modes are most easy/comfortable to integrate in your family/community?
- What ways have you used to help Manvir's communication develop?
- Have there been any approaches that therapists/school have used that have been helpful to Manvir and/or to you in supporting him?
- Are there particular approaches that would be helpful for me/school to use in the future?
- How do you see this strategy working during daily routines, such as mealtimes and bedtime?

Guiding Questions for Family Interviews - Phase 4

What have you noticed about collaboration during the research project:

	Rating Low/Med/High	Explanation/more info
Respectfulness of team members towards your culture, family needs		
Sharing knowledge of team members		
Communication about expectations before and during the project		
Time available to meet and communicate with team		
Time available to practice		
Availability of team members during the project		

What has been your experience of using the bilingual vocabulary with the AAC system?

	Rating Low/Med/High	Explanation/more info
The words/phrases chosen were important for Manvir		
Information and ideas about how to teach or practice words/phrases		
Amount of vocabulary to practice		
Relevance of vocabulary to everyday situations/practice		

What has been your experience of using AAC system use to interact with your child?

	Rating Low/Med/High	Explanation/more info

I see AAC systems as supporting my child communication		
I would like to consider other tools/approaches in future		
I need additional strategy suggestions to use these		
I need activity ideas (structured or unstructured) to use these		
Using symbols helps my child understand the meaning of words		

Is there anything you would do differently in future because of the work we have done together?

Examples

	Rating Low/Med/High	Explanation/more info
Focus on specific target language in both Gujarati and English		
Communicate with school staff about the words you are focusing on at home		
Use TouchChat or NovaChat during reading activities at home		
Use TouchChat or NovaChat when talking about Manvir's day at home		
Use TouchChat or NovaChat to find some of the words you are using when talking with Manvir (Aided Language Stimulation)		

What could I do differently in working with your family/culture in future?

.....
.....
.....

How would you describe the experience of participating in this project (e.g., if communicating to another family considering this)?

.....

Appendix D: Guiding Questions for Staff Interviews



Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration: Guiding Questions for Staff Interviews - Phase 1

Communication skills & modes

- What are Manvir's strengths/interests?
- What ways does Manvir communicate with you? What other ways does he participate in class?
- What communication skills do you see as important to teach Manvir? (e.g. by the time he finishes primary school?)

Home-School Collaboration

- What works well in terms of sharing learning or identifying goals with Manvir's parents?
- What ways work well in terms of communicating between home and school?

Dual language approaches

- Does Manvir participate in ESOL classes at school?
- Have you received any professional development in your current or previous roles regarding dual language strategies for bilingual learners?
- What support/opportunity do you have in integrating these strategies into classroom learning/therapy?
- Are you aware of any staff members or students who speak the same L1 as Manvir and family?
- Are there particular events related to Manvir's culture at school? How does Manvir participate in these events?

- How could words and phrases important to Manvir's family be integrated into his learning/therapy?

Enhancing AAC

- What do you like about Manvir's AAC system?
- What do you find challenging about it?
- What support would make the system easier to use?
- Are there other communication modes that work well in different settings (e.g. school assembly, events, playground)?
- What strategies have you noticed help support Manvir's communication?

Guiding Questions for Staff Interviews – Phase 4

1. What have you noticed about the collaboration that took place through the research project:

	Rating Low/Med/High	Explanation/more info
Respectfulness of team members towards the family's culture and needs		
Time available to meet and communicate with team/family		
Sharing of knowledge between team members		
Communication about expectations before and during the project		
Time available to practice		
Anything else that was helpful? Or difficult/uncomfortable?		

2. What is your perspective on the following dual language factors:

	Rating Low/Med/High	Explanation/more info
The words/phrases chosen were important for Manvir		
Information and ideas about how to teach or practice the target words/phrases		

Amount of bilingual vocabulary to practice		
Relevance of vocabulary to everyday situations/practice		
Anything else that was helpful? Or difficult/uncomfortable?		

3. What is your perspective on the following factors regarding AAC system use?

	Rating Low/Med/High	Explanation/more info
I see AAC systems as valuable for Manvir's communication		
I would be open to use an AAC system/this tool with other students in future		
I need additional strategy suggestions to feel confident using AAC systems		
I need more activity ideas (structured or unstructured) to use these with confidence		
Using symbols helps Manvir (children with communication needs) understand the meaning of words		
Anything else that was helpful? Or difficult/uncomfortable?		

- 4. Is there anything you would do differently in future because of the work we have done together?**

Response:

Collaboration	
Dual language strategies	
AAC systems	

- 5. What would you do differently in working with families from this culture/other cultures in future?**

Response:

- 6. How would you describe the experience of participating in this project to another teacher/therapist/LA?**

Response:

Appendix E: Massey University Ethics Committee Approval



Date: 07 July 2020

Dear Meryl Bowen

Re: Ethics Notification - **NOR 20/05 - Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration.**

Thank you for the above application that was considered by the Massey University Human Ethics Committee: **Human Ethics Northern Committee** at their meeting held on **Tuesday, 7 July, 2020.**

Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely



Professor Craig Johnson
Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

Appendix F: Parent Information Sheet



Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration: Information Sheet for Parents

Invitation

Alongside my role as speech language therapist at school, I am studying part-time through Massey University. My study interest came about because many students I work with communicate at home with their family's first language and learn English when they begin school. I have been learning about supports for helping children to learn both languages together (dual language learning strategies), when they also use communication devices, like the NovaChat and TouchChat apps. I would like to work closely with one student who uses a communication device, their parents and school team, to explore how to use dual language learning strategies together. I am inviting you to consider participating in this project.

The Project Plan

The project will involve one child, their family members, and their school team (teacher, learning assistant, ESOL teacher, school SENCO, occupational therapist, physiotherapist, and speech language therapist/researcher). A cultural advisor will also be identified to carry out an interview for cultural and language knowledge and, if required, to interpret during interviews and translate written information for you. The project will take place through four phases across 1-2 school terms.

- Phase 1 (2-3 weeks): Assess - Explore the child's current communication skills at home and school through interviews (45-60 minutes) with the child, parents and school staff, observations of the child's communication in each place (10-15 minutes on 4 separate occasions across one week, using video recording and case notes), and reviewing school documentation – Individual Education Plans (IEP), assessment data, case notes, and device data. Interview with cultural advisor to gain additional information regarding family language and culture.

- Phase 2 (2-3 weeks): Plan – Meet together as a team to develop a plan using dual language strategies (45-60 minutes). This may involve selecting important vocabulary and phrases in each language, identifying language learning strategies, and programming the communication device with new vocabulary.
- Phase 3 (4 weeks): Act - Put the shared plan into action during agreed times, both at home and school with regular SLT/researcher support.
- Phase 4 (2-3 weeks): Reflect – Evaluate the action plan, and your experience of the project through follow up interviews (45-60 minutes) and observations of the child's communication in each place to observe any changes (10-15 minutes on 4 separate occasions across one week, using video recording and case notes).

Additional Information

- When videoing during phases 1 and 4, I will ensure everyone involved is comfortable. I will stop immediately if any participant shows reluctance to continue, or the household or classroom is disrupted by my presence.
- The information gathered (through interviews, observations, video recordings, emails related to the project, meeting notes, IEP documentation, case notes of observations or conversations, device data, and previous and current assessment data) will be analysed by myself, in consultation with my research supervisors.
- The results of the study will be presented in my Masters' thesis and may be published in journal articles or presented at conferences. The data collected will be kept anonymous in publications or presentations about the project. There is a risk that participants may be identifiable to others within the [school name] community given that the study is small and focused within the [syndicate name].
- Any information will be stored on password protected computers or in a locked filing cabinet in Dr Clendon's office. The only people with access will be myself and my supervisors. Consent forms will be stored separately. Information will be kept for 5 years after the completion of the final publication. When disposed of, the University confidential waste service will be used.
- At the conclusion of the study, I would like to meet with you, and the school team, to talk about the findings. I will also provide you with a written summary.

Your Rights

In following ethical procedures for research, I reassure you that you are under no obligation to consent to participate. If you decide to participate, you have the right to:

- Ask any questions about the study at any time.
- Withdraw from the study at any stage up until two weeks after the phase 4 interview.
- Review any video footage that includes you and/or your child.
- Ask for any video footage that includes you and/or your child to be erased from the data set.
- Decline to answer any question during the interviews or conversations.
- Ask for the recorder to be turned off at any time during the interviews or conversations.
- Review the transcript from the interviews.
- Provide information on the understanding that your name will not be used.
- Be given access to a summary of the project findings when it is concluded.

Contact Information

My supervisors for this research are Dr Sally Clendon (S.Clendon@massey.ac.nz; Ph: 09 4140800 X 43537) and Dr Elizabeth Doell (E.H.Doell@massey.ac.nz; Ph: 09 414 0800 X 41488). You are welcome to contact them to discuss this project.

Ethics Approval

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application NOR 20/05. If you have any concerns about the conduct of this research, please contact Dr Fiona Te Momo, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 43347, email humanethicsnorth@massey.ac.nz.

Thank you for considering this request. Please let me know if you would like to discuss this project further.

Meryl Bowen

Master's student

Appendix G: Information Sheet for Staff



Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration: Information Sheet for Staff

Invitation

Alongside my role as speech language therapist at school, I am studying part-time through Massey University. My study interest came about because many students we work with communicate at home with their family's first language and begin to learn English when they start school. I have been learning about supports for helping children to learn both languages together (dual language learning strategies), when they also use communication devices, like the NovaChat and TouchChat apps. I would like to work closely with one student who uses a communication device, their parents and school team, to explore how to use dual language learning strategies together. I am inviting you to consider participating in this project.

The Project Plan

The project will involve one child, their family members, and their school team (teacher, learning assistant, ESOL teacher, school SENCO, occupational therapist, physiotherapist, and speech language therapist/researcher). A cultural advisor will also be identified to carry out an interview for cultural and language knowledge and, if required, to interpret during interviews and translate written information for the participant parents. The project will take place through four phases and across 1-2 school terms.

- Phase 1 (2-3 weeks): Assess - Explore the child's current communication skills at home and school through interviews (45-60 minutes) with the child, parents and school staff, observations of the child's communication in each place (10-15 minutes, using video recording and case notes), and reviewing school documentation – Individual Education Plans (IEP), assessment data, case notes, and device data. Interview with cultural advisor to gain additional information regarding family language and culture.

- Phase 2 (2-3 weeks): Plan – Meet together as a team to develop a plan using dual language strategies (45-60 minutes). This may involve selecting important vocabulary and phrases in each language, identifying language learning strategies, and programming the communication device with new vocabulary.
- Phase 3 (4 weeks): Act - Put the shared plan into action during agreed times, both at home and school with regular SLT/researcher support.
- Phase 4 (2-3 weeks): Reflect – Evaluate the action plan, and your experience of the project through follow up interviews (45-60 minutes) and observations of the child's communication in each place to observe any changes (10-15 minutes on 4 separate occasions across one week, using video recording and case notes).

Additional Information

- When videoing during phases 1 and 4, I will ensure everyone involved is comfortable. I will stop immediately if any participant shows reluctance to continue, or the household or classroom is disrupted by my presence.
- The information gathered (through interviews, observations, video recordings, emails related to the project, meeting notes, IEP documentation, case notes of observations or conversations, device data, and previous and current assessment data) will be analysed by myself, in consultation with my research supervisors.
- The results of the study will be presented in my Masters' thesis and may be published in journal articles or presented at conferences. The data collected will be kept anonymous in publications or presentations about the project. There is a risk that participants may be identifiable to others within the [school name] community given that the study is small and focused within the [syndicate name].
- Any information will be stored on password protected computers or in a locked filing cabinet in Dr Clendon's office. The only people with access will be myself and my supervisors. Consent forms will be stored separately. Information will be kept for 5 years after the completion of the final publication. When disposed of, the University confidential waste service will be used.
- At the conclusion of the study, I would like to meet with you, and the school team, to talk about the findings. I will also provide you with a written summary.

Your Rights

In following ethical procedures for research, I reassure you that you are under no obligation to consent to participate. If you decide to participate, you have the right to:

- Ask any questions about the study at any time.
- Withdraw from the study at any stage up until two weeks after the phase 4 interview.
- Review any video footage that includes you.
- Ask for any video footage that includes you to be erased from the data set.
- Decline to answer any question during the interviews or conversations.
- Ask for the recorder to be turned off at any time during the interviews or conversations.
- Review the transcript from the interviews.
- Provide information on the understanding that your name will not be used.
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Thank you for considering this request. Please let me know if you would like to discuss this project further.

Meryl Bowen

Master's student

Appendix H: Student Assent Script

Enhancing Augmentative and Alternative Communication (AAC) Use through Dual Language Learning Strategies and Home-School Collaboration: Process and Script for Student Consent

The student will be invited to participate through the following process:

1. The child's parents and team will agree on the best person to inform the student (parents, class teacher, SENCO).
2. The following script will be given to the student (alongside the visual script on the following page).

"Meryl wants to do some special work with your parents, and teachers, with your help. She wants to know how to help you communicate with words that are important for you and your family – words in your language (name this).

Is that okay with you?"

Yes / No (communicated through)

"Meryl wants to tell other people about what she, your parents, and teachers learn. She will write about this and might talk to people about this at meetings.

Is that okay with you?"

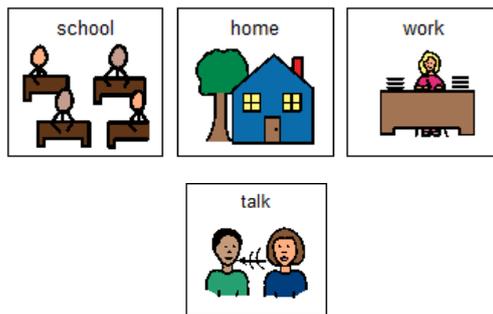
Yes / No (communicated through)

"You can ask Meryl if you want to know more about the work she is going to do."



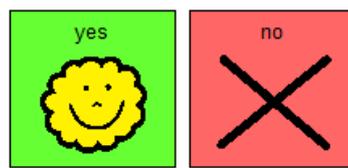
Meryl's Special Work

Meryl wants to do some special work with your parents, and teachers, with your help. She wants to know how to help you communicate with words that are important for you and your family – words in your language.

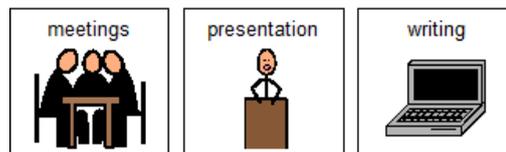


Is that okay with you?"

Yes / No

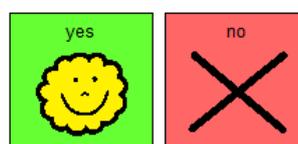


Meryl wants to tell other people about what she, your parents, and teachers learn. She will write about this and might talk to people about this at meetings.



Is that okay with you?"

Yes / No



You can ask Meryl if you want to know more about the work she is going to do.



