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Development of a sociocultural phonological program to support young Indigenous children's consonant production

Carolyn D. Pogson

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**Development of a sociocultural phonological program to support young Indigenous
children's consonant production**

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Course Number: 201 Doctor of Philosophy

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Dr Jan Wright

29 March 2021

Certification

I, Carolyn Pogson, declare that this thesis, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at this or any other academic institution.

Carolyn Pogson
29th March 2021

Acknowledgement of country

I would like to acknowledge the traditional custodians of this land and pay my respects to the Elders past, present and future for they hold the memories, the traditions, the culture and hopes of Aboriginal people everywhere.

Personal acknowledgements

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Abstract

Oral language proficiency and phonological skills underpin children's literacy development. In Australian schools, literacy is based on Standard Australian English (SAE). Children who speak an Indigenous language or a different dialect of English are expected to have the same understanding of SAE as children who have been taught to speak or understand SAE from birth. For some Indigenous children, school may be the place where they first hear some SAE sounds. As indicated by a substantial body of research, oral language forms the basis of early literacy; Indigenous children, if they have no specific support in learning SAE as a second dialect, are likely to fall behind academically, and often remain behind their peers throughout their years of schooling.

Both my experience as an educator and the relevant literature suggest that SAE consonants are an area of oral literacy that can be particularly challenging for children. There are considerable differences between the articulation of consonants in Indigenous dialects of English and SAE, particularly with obstruents. If Indigenous children are to bridge the differences between their Indigenous dialects of English and SAE, they need targeted assistance in the pronunciation of SAE consonants in their literacy lessons.

The purpose of this study, then, was to develop guiding principles for a consonant phonological program for five- to seven-year-old Indigenous children that could affect their literacy learning. Design-based research (DBR) was chosen as an approach to inform the design of a consonant phonological program that would best support Indigenous learners by incorporating practitioner knowledge and community support. DBR provides the means to systematically test and refine the program and provide principles that could be used in the development and implementation of similar programs in the future.

A DBR approach proceeds through four phases. In my study, Phase One explored the nature of the problem and began the process of developing the principles for the design of the program through a review of relevant empirical and theoretical literature and interviews with authorities in the fields of literacy and Indigenous learning. This included educators, speech language pathologists, community members and Indigenous Elders (respected senior people who hold the spiritual, traditional and intellectual knowledge of their people). A focus group of five participants from the original interview participants was set up as an evaluative group as the program and principles were refined in the next three phases. The outcome of Phase 1 was a set of draft guiding principles (DGPs) to guide the development of a sociocultural phonological program (SPP), which would serve as a basis for a culturally appropriate pedagogy for teaching SAE consonants to young Aboriginal children. In Phase 2, the solution to the problem, the SPP, was developed based on the DGPs created in Phase One. Phase 3 of the research involved the implementation of the program in two iterations, with two groups of five Indigenous children. For each iteration, data were collected through the administration of the Diagnostic Evaluation of Articulation and Phonology Assessment (DEAP) at the commencement and conclusion of each iteration to both ascertain the children's individual needs and to assess their progress throughout the iteration. Writing samples were also collected to assess the transferability of the articulation's children had learnt. Qualitative data in the form of formal and informal interviews with the teachers implementing the SPP were also used in the process of evaluation and the refinement of the draft guiding principles at the conclusion of each iteration.

The DEAP results from Iterations One and Two indicated that the SPP successfully catered for the children's individual articulation needs. These results and the children's writing samples confirmed the constructive effect that the SPP had on individual children's

pronunciation. The writing samples and feedback from class teachers indicated that the SPP had a positive impact on the children's literacy development.

During the fourth and final phase of the research, the DGPs were revisited and refined with the support of the focus group of educational practitioners, community members and Indigenous Elders. The DGPs became, in DBR terms, the design-based principles (DBPs). These DBPs are intended to be transferable to other contexts, including international contexts, and to provide the foundation of future programs to support young Indigenous children's acquisition of Standard English consonants.

This thesis concludes with a reflection on the research's contribution to the extension of second-dialect acquisition theory and practice. DBR provided a valuable approach to provide a set of DBPs that have the potential to extend and enrich oral proficiency and phonological awareness of young Indigenous children. The DBPs have undergone thorough refinement and offer evidence-based guidance for those wishing to develop and implement programs and practices similar to the individual SPPs described within this research.

List of Abbreviations

AAE	Australian Aboriginal English
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum Assessment and Reporting Authority
AECG	Aboriginal Education Consultative Group
AIATIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
ATSI	Aboriginal and Torres Strait Islander
DBP	Design-based Principle
DBR	Design-based Research
DEAP	Diagnostic Evaluation of Articulation and Phonology Assessment
DGP	Draft Guiding Principle
ESD	English as a second dialect
ESL	English as a second language
IPA	International Phonetic Alphabet
MultiLit	Making up for lost time in literacy
NALP	National Accelerated Literacy Program
NAPLAN	National Assessment Program Literacy and Numeracy
NSW DEC	New South Wales Department of Education and Communities
PA-EFL	Phonological Awareness – English as a Foreign Language
PhD	Doctor of Philosophy
SAE	Standard Australian English
SDA	Second-dialect Acquisition
SLM	Speech Learning Model
SPP	Sociocultural Phonological Program
WAACHS	Western Australian Aboriginal Child Health Survey
WALNA	Western Australian Literacy and Numeracy Assessment
ZPD	Zone of Proximal Development

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Chapter 1

Background

Problem and purpose

Over my 20 plus years as a primary-school teacher in semi-urban New South Wales, I have observed Indigenous children who, at the beginning of their schooling, often unbeknownst to the school or their teacher, speak a dialect of English that is different to Standard Australian English (SAE). My full realisation of this occurred one day when a child, who was in kindergarten at that time, said, “You’re gammon”, meaning “you’re joking”, when I asked him if he wanted to go to the sickbay during a Physical Education lesson. I had no idea he could speak a different dialect of English, and neither did his class teacher. He told me what the word meant and I learnt a new word. We laughed and played with the word “joke”, as he clearly had not intended to use the word “gammon”, and I endeavoured to relieve any emotional unrest it may have caused. Because SAE is the dialect of English that is taught in schools and is the dominant language within Australian society, Indigenous children who speak an Indigenous language, or a different dialect of English, are expected to have the same understanding of SAE as children who have been taught to speak or understand SAE from birth (Thorpe et al., 2004). As with all Australian children, Indigenous children’s language learning journey begins at home with their parents or carers, whom they mimic, and from whom they initially learn to speak. This upbringing represents a significant cornerstone of the development of both their language and identity. Language, particularly in Indigenous culture, is an integral part of a person’s identity (Ochs, 1993; United Nations, 2012), and consideration of a child’s culture and language learning journey are vital for their progression in the Australian schooling system.

Twenty-eight years of teaching experience have shown me that Indigenous children find it difficult to learn SAE at the same rate as those children who started school speaking

SAE. The literature reflects my personal experience, indicating that these children often fall behind academically (Dreise & Thomson, 2014; Frigo et al., 2003; Richards, 2008; Zubrick et al., 2006). I argue, along with others (Hill & Launder, 2010; Nation & Snowling, 2004; NICHD Early Child Care Research Network, 2005; Storch & Whitehurst, 2002), that oral language forms the basis of early literacy. Seigel (2010) emphasises that the greater the similarity between varieties of language, the more likely it is that learners will have trouble separating them. Lin (1965) further pointed out that the interference in learning two closely related dialects is greater than between two different languages. It follows that phonemes can be more difficult to learn if they are similar to the phonemes in the dialect of English Indigenous children already speak (Aoyama et al., 2004). As many studies have demonstrated, children tend to read and write the way they speak (Bishop & Snowling, 2004; Cabell et al., 2009; Catts et al., 1999; NICHD Early Child Care Research Network, 2005; Storch & Whitehurst, 2002). Thus, children's articulations are typically reflected in their writing.

Both my experience as an educator and the relevant literature (Eades, 1993; Toohill et al., 2012) suggest that SAE consonants are an area of oral literacy that can be particularly challenging for children. There are considerable differences between the articulation of consonants in Indigenous dialects of English and SAE (Butcher, 2008; Toohill et al., 2012). If Indigenous children are to bridge the differences between their Indigenous dialects of English and SAE, they need targeted assistance in the pronunciation of SAE consonants and in their use in literacy.

As Zubrick et al. (2006) point out, any program targeting consonant production needs to happen early in a child's schooling. Research has demonstrated that oral consonant articulation, together with phonemic awareness training, have a substantial impact on students' literacy outcomes (Callaghan & Madelaine, 2012; Foorman et al., 2003; Goswami,

2001; Nation & Snowling, 2004). Addressing the consonantal differences in dialects early in children's schooling could assist children to not only meet the literacy expectations of the Australian English curriculum (Australian Education Council, 1994; NSW Board of Studies, 2012) in the early years of schooling, but also provide a solid literacy base for future literacy learning. Currently, educators are lacking resources in this area.

Thus, the purpose of the study described in this thesis was to investigate and design a set of guiding principles that enabled the development of a sociocultural phonological program that could be taught in a variety of contexts. Key components of such a program, being based on sociocultural theory, would involve: learning with a more experienced adult (person) in a social context (Kozulin, 1990; Vygotsky, 1962, 1978), in the Zone of Proximal Development (Lantolf, 2000; Vygotsky, 1962, 1978), where learning is scaffolded (Bruner, 1983; Gibbons, 2015; Walqui, 2006) and both student's L1 and Standard Australian English are discussed (metalanguage) and used in in play (Broner & Tarone, 2001; Cummins, 2001; Swain & Lapkin, 2000, 2002). The other vital element in the development of these principles was the incorporation of practices and programs that respect Australian Indigenous children's culture and identity. It is when these features are incorporated into guiding principles and utilised effectively that children's learning outcomes are likely to be enhanced (Fanyu & Wanyi, 2013; Lantolf & Poehner, 2008; Lantolf & Thorne, 2006; Verenikina, 2008; Wang, C, & Hughes, 2011).

Research Questions

To achieve the purpose described above, the following two questions guided the study.

- 1) What are the necessary underlying principles for a sociocultural program that can support Indigenous children's understanding and acquisition of second-dialect consonant sounds and literacy in the early years of schooling?

- 2) What are the contextual factors that need to be taken into account when designing such a program?

Research design

A Design-based Research (DBR) approach (Bell et al., 2004; Brown, 1992; Christensen & West, 2017; Collins, 1992; Reeves, 2006; Wang & Hannafin, 2005) was selected to drive this research. DBR is now widely used in educational research to design practical solutions to educational problems (Barab et al., 2010; Clarke & Dede, 2009; Cotton et al., 2009; Eady, 2010; Swan, 2007). As McKenny and Reeves (2013) argue, DBR enables research that “strives towards both the development of an intervention to address a problem in practice and empirical investigation yielding theoretical understanding that can inform the work of others” (p. 1). As the study described in this thesis involved the creation of an innovative program (the sociocultural phonological program, or SPP) for developing young learners' consonantal production in SAE, it was important to select an approach that enabled such a practical solution, and was based on a solid foundation of theoretical knowledge and understanding.

Reeves's model (2000, 2006) sets out four phases of the DBR approach: an initial phase, where the researcher addresses a problem of interest through discussion with practitioners and study of the literature; a second phase, where the problem is fully conceptualised and the researcher designs an intervention that has the aim of solving the problem; a third phase, which focuses on refining and testing the intervention through repetitive cycles of data collection and analysis; and a fourth phase, where the researcher uses

the principles refined in the third phase to reflect on the principles and make final adjustments, if any, to the intervention. The DBR approach concludes by presenting a set of design-based principles that have evolved as a result of the DBR approach and can be applied in various contexts.

The DBR approach affords the inclusion of a range of methods within its frame (Patton, 2002). My study employed a combination of quantitative and qualitative methods (Reeves, 2000): semi-structured interviews; focus-group interactions; cyclic iterations of teaching and evaluation using the Diagnostic Evaluation of Articulation and Phonology Assessment (DEAP) (Dodd et al., 2002) as a pre-test and post-test iteration assessment; and observations (using video recordings) with the collection of student work samples.

Location and participants

Two groups of participants were recruited for the research. As a starting point and in keeping with the DBR approach, educational practitioners, both Indigenous and non-Indigenous, were carefully chosen to provide insights into the program development in both its initial stages and throughout the SPP iterations or implementations. Their knowledge and feedback were sought through semi-structured interviews and focus-group discussions, which occurred following the initial program design and after each iteration of the phonological program. Their collective perspectives were essential in identifying the potential social and cultural factors that would affect the design and implementation of an educational literacy program for Indigenous children. The educational practitioners included primary teachers, speech pathologists and university lecturers working in the areas of second language and dialect acquisition, Indigenous studies, language and literacy and primary education. The participants were located in various states across Australia and collectively brought an abundance of knowledge and experience to the research.

The second group of participants were Indigenous children who had been identified by their teachers as children who at times pronounced sounds differently to that of SAE as spoken at school. They were recruited to be involved in one of the two iterations of the program. Ten Indigenous children aged between five and eight were recruited from a semi-urban school on the outskirts of Sydney. Five of the children were recruited to be involved in the first cycle of teaching the program and data collection (Iteration 1). Following the refinement of the program, a second group of five children were recruited to be involved in the second cycle of teaching (Iteration 2).

Reflections on language and identity

In positioning this inquiry for the reader, I am drawn to reflect not only on the literature and the complexities of this topic but also on a more personal reflection of my own conceptual development over time. The task of articulating this context is quite complex, involving many different elements and understandings, but is strongly connected to my 28 years of personal experiences teaching school children, and to my family, the Indigenous community, education professionals, and research literature through this and prior studies.

It is extremely difficult to identify when my journey down this research path initially began. Perhaps it was as far back as my childhood schooling experience, when my third-grade teacher sat me next to a Yugoslavian girl and encouraged me to teach her to speak, read and write Standard Australian English (SAE). Or perhaps my journey began with the many muddled-language conversations I had with my own family as a young person. Many memories remain from those early days but in particular, I remember two distinctly. The first of which was my complete frustration in trying to explain to my monolingual Estonian grandmother what *tights* were. As I was only six years old and unable to speak Estonian, I had to resort to gestures. She happily played along, but repetitively said “trousers”. I remember the feeling of defeat and complete inadequacy of not being able to fully

communicate the concept to her, as well as the relief I felt when my father entered the room and explained what I was trying to tell her.

When I asked my father to teach me to speak his language, he refused, and told me it was a “dead language” in Australia. This comment embedded the strong connection between personal identity and language deeply within my psyche, and made me realise how difficult this realisation and transition must have been for my father. This helps me to better understand the link between Indigenous people, their identity, and their language.

My second memory comes from when I was a child of about eight years old. My father came into the room to check that I was ready to go to bed and I enquired about the whereabouts of my cousin, Robert. My father said “Pobbit is butting on his byjamas and getting into ped”. As a child, it took me a while to understand what he was saying but I soon fully understood that he simply mixed the consonant sounds. As an adult, I realise that he was thinking in his first language, and transferring it to his second language (Aoyama et al., 2004; Flege et al., 2003) and because he was tired, he was making some articulation errors.

These formative experiences as a child not only shaped my awareness and perception of the difficulties people experience learning a second language or dialect, but also informed my understanding of how the nuances of language can cause communication to be interrupted. Encouraging and supporting children learning English thus continued to be a focus throughout my many years of primary-school teaching. I have had the opportunity to teach in urban schools with populations of Indigenous students ranging between 10-15%. I have observed firsthand their frustrations learning SAE, which was not their first dialect (Australian Bureau of Statistics, 2011). While teaching children in schools, I have had the privilege of working closely with Indigenous communities and experiencing many discussions regarding the parents’ attitudes to education and the frustrations they experienced both in supporting their own children’s learning and with the education system in general.

Parents of Indigenous students want the best for their children even though this can affect their perception of their own personal identity. For instance, a student's grandmother and I were talking about learning when she told me that "This is not our way of thinking but white man's. We need to help our children learn white man's way in order for them to get along in life." Initially I was shocked by this statement but later realised that what she was really talking about was basically what my father had told me earlier in my own life. He had said that the future is not in learning his language but in learning SAE, the dominant language/dialect in Australia. She was telling me that the way of the future for her grandson was, in part, to embrace SAE, his second dialect, which in turn added another dimension to his identity.

Recently, I had another conversation with a child's parent regarding the differences between SAE and Australian Aboriginal English (AAE). I was trying to convey the concept that in the context of this research, the teachers involved in the SPP valued Indigenous languages. I explained to her that during each lesson, the teacher reminds her child that we (her teachers) are pleased she speaks differently at home. The teacher also informs her that what is taught in the lesson is for her use at school. The parent surprised me by saying, "We speak didg [meaning AAE] at home. I was upset when I first heard about what you were doing but now, I think anything you can do to help is wonderful. Thank you. Why aren't other schools doing this?" Initially this parent said she felt upset with our teaching because she felt we were devaluing her culture or taking part of her daughter's identity away. When she realised this was not our intention, she felt happier about what we were teaching. She felt further at ease when she understood that we were supporting her child's acquisition of SAE and talking to her child about the differences between the two dialects. This discussion highlighted the importance of both-ways or two-way teaching/learning (Ober, 2009; Ober & Bat, 2007) where learning is student-centred and a shared journey that strengthens Indigenous

identity (Bat, Kilgariff, & Doe, 2014). Children are able to engage in discussions about their L1 while learning Standard Australian English (Malcolm, 1995).

When we as educators try to assist Indigenous students in our classrooms, we need to be mindful of how parents and students feel, discuss with parents how we are going about teaching the program with their children, and consider Indigenous pedagogies. This is necessary as students and parents may not just view this as changing a few sounds or words, but also as an attempt to change their identity. Nicholls (2005, p. 164) reinforces this concept by saying that, according to Indigenous people, “language plays a critical role in the process of children’s identity formation” – just as my father’s decision to use SAE was in itself a change in his personal identity. For this reason, our best intentions need to be approached with care, ensuring that we engage with the children and their families both respectfully and discretely. It is important to teach children that their Indigenous language or dialect is different to SAE and that learning, understanding and using the appropriate nuances at the appropriate times are highly valuable; yet, at the same time, it is critical to not take away from the skill and privilege of having their own language (Sharifian, 2001, 2008; Williams, 2011).

Throughout my journey as a teacher, to my knowledge, I have only observed two Indigenous families who have gained this realisation. The child discussed above is from one of these families. She is in the early years of primary school and has not been assessed by the national Australian benchmarks (NAPLAN). The children from the other family have all successfully attained primary school benchmarks (Year 3 and 5 NAPLAN results). This awareness of the importance of identity, the relationship between first and second language (dialect) and the building blocks (phonemes) on which language is built underpins this research. It is my intention to assist young Indigenous children (and their families) to be

aware of these relationships and attain their literacy benchmarks early in their schooling so that they can achieve their personal goals in the future.

Thesis structure

This thesis is presented in nine chapters, five of which describe the research undertaken in relation to the four phases of the DBR approach.

Chapter One describes the foundation of the research on which subsequent chapters are built. It highlights the importance of this research and provides the background underpinning it. It presents an overview of the approach and methodology used to carry out this study.

Chapter Two provides a literature review that highlights the need for this research. It discusses the differences between Indigenous languages and SAE and the impact that phonological and oral language skills have on literacy development, and describes previous programs that have been used to assist Indigenous children learn SAE.

Chapter Three discusses the DBR approach and the qualitative and quantitative methods employed in the different phases of the research. This includes the participant-selection process and the data-collection methods and analysis. The chapter also provides a comprehensive explanation of the ethical procedures taken as well as the measures taken to ensure trustworthiness.

Chapter Four (Phase 1) describes the development of the draft guiding principles (DGPs). It commences with a review of the scholarship in the field of oral language as a first step towards informing the pedagogical and content aspects of the DGPs. The second section of the chapter describes the further refinement of the DGPs based on an analysis of interviews conducted with educational experts and Indigenous Elders, who had been selected for their

knowledge and expertise in teaching young Indigenous children Standard Australian English (SAE).

Chapter Five (Phase 2) explains the use of the DGPs developed in Phase 1 in designing the sociocultural phonological program (SPP). It describes the decision-making in the design of each aspect of the SPP, which was used as the basis for the programs modified according to the needs of individual students, implemented in each iteration and described in the following two chapters.

Chapters Six and 7 (Phase 3) describe the adaptation of the SPP for the children participating in the intervention; the implementation of the program; the collection and analysis of empirical data to determine the effectiveness of the content and the pedagogy of the SPP in enhancing each child's phonological learning; and the further refinement of the DGPs based on these results.

Chapter Eight describes Phase 4 of the DBR where the final DBPs for a SPP for Indigenous second-dialect learners between the ages of five and seven are reflected upon, refined and presented. Each of the research questions is addressed, and modifications and future directions are discussed. Particular consideration is given to the application of the DBPs in other contexts.

Chapter Nine draws final conclusions from the research and argues for the study's contribution to theory. It emphasises the need for further research.

Chapter 2

Literature Review

In this chapter, I situate the inquiry within the broader context of Indigenous children's acquisition of Standard Australian English (SAE) by reviewing the literature on Indigenous children's literacy acquisition. It is through this literature that the differences between Indigenous and non-Indigenous children's literacy proficiency can be compared. The magnitude and nature of this issue is further explained through the discussion of the impact of oral language on literacy development, and the differences between Australian Aboriginal English (AAE) and SAE. This is followed by a review of the programs that have been used to address the difference between Indigenous and non-Indigenous children's literacy acquisition. This amalgamation of information from the literature provided a narrower focus and guided the initial direction of the study.

The magnitude and nature of the problem

A review of research and reports on Indigenous children's literacy status and progress within the Australian schooling system points to the enormity of the inequalities in Indigenous children's literacy development and their consequent chances of success in the Australian school system in later life. This research identifies the differences between Indigenous and non-Indigenous children's literacy development; the impact of phonological skills and oral language on literacy development; the difference between Indigenous and non-Indigenous phonological development; and the phonological differences between AAE and SAE. Each of these areas of research is discussed in separate sections below.

Difference between Indigenous and non-Indigenous children's literacy development

Indigenous children often grow up in complex language environments where they hear and learn multiple languages (Wigglesworth, Simpson, & Loakes, 2011). Indigenous children are often exposed to rich and complex language/s and experience complex language

development due to their interaction with multiple varieties of English. The languages they experience may include non-standard varieties of English, various English-based-creoles, traditional languages, Aboriginal English, Standard Australian English (SAE) (Kaldor & Malcolm, 1979; Munro, 2000) and/or languages from a variety of other countries. There are substantial differences between these creoles and languages, from basilectal (heavier) to acrolectal (lighter). These languages are languages within their own right, and some with important regional variations (Lo Bianco & Freebody, 2001). They are different to SAE in many aspects, particularly in semantics, grammar, vocabulary and phonology (Wigglesworth, Simpson, & Loakes, 2011). Further, Indigenous children experience the rich linguistic environments of Indigenous communities, where individuals communicate using sophisticated multilingual and multi-modal languages (Lo Bianco & Freebody, 2001). In real-life situations it can be difficult to determine what language speakers are using and it would be very rare to find a person who is monolingual (Butcher, 2008). The most important difference between Aboriginal English varieties and SAE is that SAE is both spoken and written while Aboriginal English is a verbal form of communication (Lo Bianco & Freebody, 2001).

For nearly two decades, research has demonstrated that Australian Indigenous students struggle to achieve the same literacy outcomes as their non-Indigenous peers (Australian Government, 2010; David Unaipon College of Indigenous Education and Research, 2009; Frigo et al., 2003; NSW Department of Education and Training, 2019; Thomson et al., 2017). These studies indicate that Australian Indigenous students are approximately two years behind their non-Indigenous peers in attaining SAE literacy outcomes, and that this difference has remained steady for at least 10 years (David Unaipon College of Indigenous Education and Research, 2009; Hutton et al., 2010; Silburn et al., 2011). The 2014 literacy results, detailed in the *New South Wales (NSW) Auditor General's*

Report on Improving the Literacy of Aboriginal Students in NSW Public Schools (NSW Government, 2014), show that the difference between Aboriginal¹ and non-Aboriginal students' achievement in literacy has not been notably reduced. Instead, the difference in achievement increases as students move through the school system (Ford, 2013). For example, non-Aboriginal Year 3 (eight to nine years old) students performed with 18.3% greater accuracy than their Aboriginal peers, and non-Aboriginal Year 9 (15 to 16 years old) students obtained grades 21.4% higher than their Indigenous peers in NAPLAN 2019 reading (Australian Curriculum Assessment and Reporting Authority, 2019). Moreover, the Australian Bureau of Statistics (ABS) (2002) figures reveal that only a small proportion of Indigenous children achieved the Year 3 reading benchmark compared to all the students who were tested. More recent assessments (Australian Curriculum Assessment and Reporting Authority, 2018, 2019) demonstrate similar trends. However, over the years from 2008, when NAPLAN commenced, results have shown an improvement in Indigenous children's literacy outcomes. For example, the results of the 2008 NAPLAN Year 3 reading assessment, in comparison to the 2019 results of the assessment, reveal a reduction in the difference between Indigenous and non-Indigenous children's achievement of 11.5%. However, for the same year (Australian Curriculum Assessment and Reporting Authority, 2019), Year 9 NAPLAN reading results show that Indigenous students scored 21.4% behind their non-Indigenous peers, and in the 2017 NAPLAN Year 7 (13 to 14 years old) reading results (Australian Curriculum Assessment and Reporting Authority, 2017), the same cohort of Indigenous children scoring 20.8% behind their non-Indigenous peers. If this cohort's NAPLAN results are followed back to Year 5 (10 to 11 years old), in 2015, Indigenous children scored 20.9%

¹ For the purposes of this study the term Indigenous (Australian) is used as defined by the Australian Commonwealth Department of Aboriginal Affairs: "a person of Aboriginal or Torres Strait Islander descent who identifies as Aboriginal or Torres Strait Islander and is accepted as such by the community in which he or she lives" (<https://aiatsis.gov.au/explore/indigenous-australians-aboriginal-and-torres-strait-islander-people>). If the term "Aboriginal" is used within a text under discussion, the terminology from the text will be used.

behind their non-Indigenous peers (Australian Bureau of Statistics, 2015) and in Year 3, in 2013, Indigenous children scored 14.7% behind their non-Indigenous peers (Australian Curriculum Assessment and Reporting Authority, 2013). This supports the idea that the difference between Indigenous and non-Indigenous children's results continues to expand as students progress through to Year 9.

As suggested by the figures above, Indigenous and non-Indigenous children's development appears to be more closely aligned in younger children. As early as the 1970s, De Lacey's (1971) research investigated the differences in classificatory ability and vocabulary of five- to 12-year-old "Caucasian" and Indigenous children in a range of locations in Australia (both urban and remote) using an adapted version of Piaget's theory of cognitive development (Inhelder & Piaget, 1964) and the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1959). This study demonstrated that Indigenous and non-Indigenous children had similar age-related cognitive abilities. It found, however, that the non-Aboriginal students in the study demonstrated greater verbal proficiency than their Aboriginal peers using the PPVT. More recently, Leigh and Gong's study (2009) compared three- to five-year-old Aboriginal pre-school students and their non-Aboriginal peers using the PPVT and found that the non-Aboriginal children were only approximately 0.3 to 0.4 standard deviations ahead of the Aboriginal students. Taking into consideration the cultural differences between the two cohorts, it is possible that the Aboriginal children may not have had the experience or language to recognise the pictures within the PPVT, reinforcing the notion that both Indigenous and non-Indigenous children's learning is closer during the early years of school. As Leigh and Gong (2009, p. 254) state, "policies targeted at improving school outcomes in the early years may reduce the racial test score gap in Australia".

The Western Australian Aboriginal Child Health Survey (Zubrick et al., 2006) is one of very few studies that have explored the possible reasons for the difference between

Indigenous and non-Indigenous children's development. This large empirical study, consisting of 5,289 Aboriginal students and their schools, was conducted to explore the health, well-being and education of Western Australian Aboriginal and Torres Strait Islander children between ages zero and 17. The study demonstrated that the academic performance of Aboriginal children was lower than that of non-Aboriginal students as they began schooling, and that the difference widened dramatically in the first years of schooling. The study also showed that it was extremely difficult for Aboriginal children to catch up to their non-Indigenous peers. The purpose of the study was to build knowledge to develop preventive strategies that could promote and maintain the academic well-being of Aboriginal and Torres Strait Islander children. It involved four measures: 1) teacher-rated literacy and academic performance; 2) an English-language word-definition test; 3) a visuo-spatial reasoning test (matrices); and 4) the Western Australian Literacy and Numeracy Assessment (WALNA) (Zubrick et al., 2006), which is the Western Australian section of the Australian national benchmark assessment (more recently known as NAPLAN).

The WALNA tests children when they are in Years 3, 5 and 7 (Ministerial Council for Education Early Childhood Development and Youth Affairs (MCEETYA), 2005). The teacher rating of the academic and literacy performance of children aged four to 17, the first measure mentioned above, is based on the teachers' scoring on a five-point Likert scale of their students' overall performance in their class. Students could be: far below age level (1); below age level (2); at average level (3); somewhat above age level (4); or far above age level (5). In the report detailing the teachers' rating of literacy and academic performance, the teacher rating indicated that 58% of Aboriginal children had low academic performance compared to 19% of non-Aboriginal children. This difference was evident from Year One (six to seven years old) onwards. The children's scores on the visuo-spatial reasoning test and English-language word-definition test indicated that non-Aboriginal children achieved higher

scores throughout their years of primary school education (four to 13 years old) than their Aboriginal peers, and the WALNA data (Zubrick et al., 2006) demonstrated that the number of Aboriginal students achieving the national benchmarks was highest in the Year 3 testing.

Furthermore, and of particular interest to my study, the WA study found that Aboriginal students who had trouble saying certain sounds were around one and a half times more likely to have low academic performance. The report on the study (Zubrick et al., 2006) does not indicate which sounds children found to be of particular difficulty, but does conclude that this is one area in which schools can make a difference. This report specifically recommends addressing the difference in the verbal pronunciation of sounds in the early years by providing language and cognitive enrichment programs in kindergarten and pre-school. The identification of the specific areas of difficulty that Aboriginal children have in the articulation of SAE sounds could assist in designing programs to specifically teach the articulation of these sounds. This is a key element of the program designed for implementation in my study.

The impact of phonological skills and oral language on literacy development

While the research reviewed above points to the discrepancies between non-Indigenous and Indigenous children's performance on academic and literacy tests, and suggests that there might be a link between academic performance and the articulation of sounds in SAE, this issue was not pursued in the Western Australian Aboriginal Child Health study (Zubrick et al., 2006).

Literacy learning is complex and children need to learn from all the basic areas of instruction. The National Reading Panel Report (National Institute of Child Health and Human Development, 2000) emphasised the importance of five critical areas of reading instruction: Phonemic awareness, phonics, fluency, vocabulary and comprehension. This suggests that articulation and verbal skills may not be the necessary ingredients for enhanced

achievement. However, this is imprecise as oral language and phonological skills underpin literacy development (Nation & Snowling, 2004; Frost, 2001) and other studies suggest that oral proficiency and phonological skills influence children's reading and spelling development (Greaney & Arrow, 2012; National Early Literacy Panel, 2008). Further to this, the Learning Point Report (Learning Point Associates, 2004) funded by the US Government recognises that the various approaches to teaching phonemic awareness, phonics, fluency, vocabulary and comprehension are not all equally effective. Paris' (2005) Conceptualised Constrained Skills Theory, where he discriminated between constrained and unconstrained reading abilities, suggests that there is a continuum of skills, with some more constrained than others. Constrained abilities are made up of a limited number of items and can be mastered within a relatively short time frame. For example, alphabet knowledge can be acquired over couple of years as opposed to over a lifetime. Phonological awareness and oral reading fluency tend to be medially constrained skills and, according to Stahl (2011), develop co-dependently with reading and spelling. The National Early Literacy Panel (2008) suggests that the instruction of constrained abilities is most effective and time efficient when it is explicit, systematic, intense, short in duration and targeted to where students are developmentally. My research targets oral language and phonological skills and is explicit, systematic, intense, short in duration and targeted to the individual child's developmental needs.

Much of the research in the area of oral language examines changes in reading and spelling development through longitudinal studies relating to phonemic awareness; that is, an individual's sensitivity to the structure of oral language (Frost, 2001; Melby-Lervag & Lyster, 2012; Muter & Diethelm, 2001; Nation & Snowling, 2004; Pullen & Justice, 2003; Verhagen et al., 2010; Yeung & Chan, 2012). For example, Frost's (2001) longitudinal study of 44 Danish kindergarten children examined the relationship between phonemic awareness

and reading and spelling development from the start of Grade 1 (six to seven years old) to the middle of Grade 2 (seven to eight years old) (one and a half years). The children were chosen based on their performance on a verbal comprehension test (KTI test), with 23 children chosen for their low level of performance (LPA) and 21 for their high performance (HPA). Each child was observed six times on six separate occasions during spontaneous writing activities. At these times the children and their class groups were also tested using different word-reading tests. At the end of Grades 1 and 2, spelling tests were used. Throughout the study, children attended routine classes and there were no interventions. Results indicated that there was a noticeable difference in reading and spelling between the two groups. Phonemic awareness was the strongest predictor of reading and spelling achievement for the LPA group. These results suggest the transfer of phonological strategies from spelling to reading, and link phonemic awareness with reading and spelling has an impact on reading. This research highlights the importance of phonological skills (in the form of phonemic awareness) in the learning of literacy (in both reading and writing).

Similar studies have explored the relationship between oral language, phonemic awareness and literacy. For example, Nation and Snowling's (2004) longitudinal study of reading compared children's oral language skills, decoding skills (phonology) and word recognition. They gave 72 children whose first language was English, at the approximate age of eight and a half years and then again at 13 years of age (four and a half years later), a variety of tests for non-verbal ability, phonological skills, oral language skills and reading. The results established that both phonology and oral language played a significant role in reading development over this time period. Together, Frost's (2001) and Nation and Snowling's (2004) studies validate the notion that phonological skills and oral language underpin literacy development; this concept in turn underpins the design-based research described in this thesis.

The difference between Indigenous and non-Indigenous phonological development

Between birth and the first years at pre-school or school, children spend most of their time listening to and interacting with their primary carers. Children thus learn language by imitating the sounds they hear pronounced by their carers (Hoff, 2003). According to multiple studies of children's language development, children's phonemic inventory completion takes place at approximately four to nine years of age (Arlt & Goodban, 1976; Dodd et al., 2003; Prather et al., 1975; Sander, 1972; Templin, 1957; Wellman et al., 1931). Extensive research has been conducted into children's consonant cluster (group of two or three consonants without a vowel)² acquisition and reduction (McLeod & Arciuli, 2009; McLeod et al., 2001; Osburne, 1996; Roberts et al., 1990; Smit, 1993) and shows how children refine their pronunciation over time before they master sounds. McLeod and colleagues (2001) reviewed 70 years of previous literature to describe children's normal acquisition of consonant clusters. This review of the literature revealed that children often delete one element of a consonant cluster (consonant reduction), and that over time this reduction diminishes, and accurate pronunciations increase until eventually production is mastered. In addition, they found that consonant clusters containing stops (e.g. /pl/, /kw/) were acquired before consonant clusters containing fricatives (e.g. /st/, /fl/). This development, however, was idiosyncratic for each child, with phoneme acquisition involving reversals, revisions and a gradual progress towards mastery. Nevertheless, they concluded that children's phonological development typically progresses through developmental stages, with fricatives and stops usually mastered by seven years of age (McLeod et al., 2001; Sander, 1972). Two studies conducted in Australia (Chirlian & Sharpley, 1982; Kilminster &

² As discussed in McLeod, S., Van Doorn, J., & Reed, V. (2001). Normal acquisition of consonant clusters. *American Journal of Speech - Language Pathology*, 10(2), 99.

Laird, 1978) determined that children have inventory completion for the sounds /v/, /θ/ and /ð/ between six and nine years of age. This is a little later in age than studies from other countries. In their study of children in the Brisbane metropolitan area, Kilminster and Laird (1978) found that the children only achieved 75% accuracy at six years of age for /v/, eight years for /ð/, and eight years six months for /θ/. Chirlan and Sharpley (1982) completed their study in the New England region of New South Wales and found that the children in their study did not achieve 75% accuracy until eight years six months for /v/ and seven years six months for /ð/ and /θ/. This research highlights the need for local norms to maintain validity of fricative mastery. This variation in data points to a contextual factor influencing when children master fricatives, which in turn points to the possibility that children from an Indigenous background may master fricatives at a different age.

Indigenous children who grow up in a community where certain consonantal sounds are not part of the local language/dialect may receive insufficient exposure to the same process of phonological development as non-Indigenous children brought up in an SAE-speaking environment (Gould, 2008; Jones et al., 2012; Siegel, 2010). Long (1990, 2007) proposes that there are “sensitive periods” that occur up to seven years of age for phonological rules and up to 13 years of age for more complex phonological rules and suprasegmentals (Long, 2007, p. 44). Bidialectal children under the age of seven years may still be acquiring the phonology of their first dialect while learning SAE at school. However, if teachers wait until after the age of seven to provide an intervention, the child misses the prime time for early intervention (Siegel, 2010). As a result, these children are disadvantaged in their acquisition of their second dialect (that is, SAE), the language privileged in their education, and may struggle to catch up to their peers academically (Zubrick et al., 2006). However, knowledge about the consonantal productions of young Indigenous children is limited. Many researchers in the field argue that more extensive research is required to assist young Indigenous children

(Butcher, 2008; Eades, 1993, 2013; Tabain et al., 2004; Toohill et al., 2012). Through the use of the DEAP assessment process, my study makes some contribution in this area.

Phonological differences between Australian Aboriginal English and Standard Australian English

Speakers of Australian English are those who were born in Australia or who immigrated at an early age and were influenced by Australian English speakers in the community. Speakers of Australian English fall into three main categories: Standard Australian English (SAE), Australian Aboriginal English (AAE) and Ethno-cultural Australian English (Cox & Palethorpe, 2007). SAE is the dominant variety of English for speakers in Australia (Clyne et al., 2001; Cox & Palethorpe, 2007), while AAE is a term that encompasses many dialects around the country (Butcher, 2008). The phonemic inventories of these AAE dialects range from those that are close to SAE (light varieties) to those that are substantially dissimilar (heavy varieties) (e.g., Kriol – a creole spoken by many Indigenous people in the Northern Territory of Australia). Heavy varieties are mainly found in remote areas, while light varieties are typically in urban, rural and metropolitan areas (Butcher, 2008). As the demographics of different regions can be complex, Indigenous students enrolled in a single school, or even within one class, may use different Indigenous dialects (McTaggart, 2010).

Indigenous dialects contain numerous differences within their vowel systems. Most AAE dialects have only three vowels (/i/, /e/ and /u/) (Butcher, 2008). However, some dialects in the north of the Northern Territory have five (/i/, /ε/, /eɔ/, /ɔ/ and /u/) (Butcher, 2008; Mulvaney & Kamminga, 1999), compared to 12 vowels and eight diphthongs in SAE (Harrington et al., 1997). Due to the number of vowels in AAE and its wide allophone use, minimal pairs in SAE such as *sleep* and *slip* may be pronounced in the same way in AAE. For instance, /e/ and /æ/ may be articulated as /ε/ so that the words *bed* and *bad* are both

pronounced as /bɛd/ in AAE (Butcher, 2008). This articulation can be problematic in an SAE school context, as the child may write the word “bed” to mean either “bed” or “bad” because the two words are pronounced the same in the child’s dialect.

Similarly, consonant sounds may differ across the dialects, and the differences are more diverse than those of vowels. Eades (2013) points out that many varieties of AAE have no /h/ at the beginning of the word. For example, *his* would be pronounced /ɪs/ in AAE. She also points out that heavy varieties of AAE rarely have /f/, /v/ or /θ/, and often change these sounds in SAE to other consonant sounds. She notes that the most common changes in AAE include the use of /p/ or /b/ for /f/, /b/ or /p/ for /v/, /t/ or /d/ for /θ/ and /d/ for /ð/. Research has also shown that fricatives can be substituted by plosives (Butcher, 2008; Kaldor & Malcolm, 1982, 1991; Laffey et al., 2014; Toohill et al., 2012; Williams, 2000), resulting in misunderstandings between speakers of SAE and AAE. Eades (1993) gives the example that, in AAE, “We ‘ad a bight” could mean either “We had a fight” or “We had a bite” in SAE (p. 3). These types of consonant sound substitutions, similar to vowel substitutions, can consequently affect written literacy, as the intended meaning of either “fight” or “bite” might be written as “bight” (or “bite”), in alignment with how the word is pronounced in AAE. Clyne et al. (2001) further suggest that heavy varieties of AAE are characterised by language interference and, as a result, sibilant, interdental and labiodentals consonants (particularly fricatives) may not be pronounced at all or may be replaced by various alternate sounds. The distinction between voiced and voiceless consonants may also not be articulated; this is well documented within the literature (Butcher, 2008; Kaldor & Malcolm, 1982, 1991; Laffey et al., 2014; Toohill et al., 2012; Williams, 2000).

Butcher (2008) describes Indigenous languages as having articulation distinctions within their systems, and suggests that there are few distinctions between voicing and manner of articulation. He notes that there are no differences between AAE and SAE in nasals,

liquids or glides, and emphasises that only a small minority of Australian Indigenous languages have a distinction between stops and fricatives. The areas of difference are entirely within the obstruent class (Butcher, 2008), which comprises stops, fricatives and affricates. This could be the reason Indigenous children have difficulty pronouncing and using the obstruent group of consonants in their written literacy. For instance, children may write “bet” for “bed” (Sharpe, 1977, p. 46), which could cause their spelling to be considered incorrect.

There are many consonant differences between AAE and SAE, as there are many Indigenous languages. These differences, whether expressed in oral or written form, may cause further misunderstandings for both Indigenous children and their teachers. Various studies point to AAE speakers’ tendency to devoice word-final consonants (Butcher, 2008; Kaldor & Malcolm, 1979, 1982; Williams, 2000). Butcher (2008) concludes that speakers of AAE are inclined to voice all consonants between vowels (unless followed by a vowel). Initial stops are usually identified as voiced (no glottal pulsing but unaspirated) and in light varieties /s/ and /ʃ/ may be interchangeable (with /s/ appearing to dominate). Similar research studies confirm this conclusion (Eagleson, 1982; Kaldor & Malcolm, 1991; Toohill et al., 2012; Williams, 2000). Affricates substituted with fricatives and affricates and fricatives alternating with palatals (later stopping) are also well documented within the literature (Butcher, 2008; Eagleson, 1982; Kaldor & Malcolm, 1979, 1991; Toohill et al., 2012; Williams, 2000). Malcolm (2018) considers AAE to contain no fricatives. Other well-documented distinctions involve /t/ and /d/ alternating with flapped /r/, /ŋ/ substituted with [n], /ŋ/ substituted with [ŋk], the deletion of /h/ and /n/, and the insertion of /h/ (Eagleson, 1982; Kaldor & Malcolm, 1991; Toohill et al., 2012; Williams, 2000). In addition, Butcher (2008) points out that, in AAE, /g/ and /ɹ/ have no equivalent, and /l/ is strikingly different from SAE. The sound /t/ is used to represent /s/, /z/, /ʃ/, /ʒ/, /tʃ/ and /dʒ/, and /tʃ/ and /dʒ/ are

often pronounced as /ʃ/ in the initial position but as /ts/ in word-final position. These changes in pronunciation can lead to a breakdown in communication. For example, children may say or write “chiraffe” for “giraffe” or “checrets” for “secrets” (Sharpe, 1977, p. 46).

Overall, the research discussed above indicates that the major difference between AAE and SAE lies in the articulation of consonants. Most of these studies focused on the phonology of the dialects, and some studied the articulations of pre-school children or those older than 10 years of age. However, little is known about the phonological development of five- to eight-year-old Indigenous children. As identified earlier, this age represents a critical time in the children’s literacy development, a period when the gap between Indigenous and non-Indigenous children’s literacy development increases to an even larger degree as they progress through the school system. Furthermore, there has been little inquiry into Indigenous children’s articulation of SAE, particularly in urban areas. Considering that AAE and SAE can differ considerably and that dialectal differences have such a huge impact on academic performance, there is clearly a need for research that is localised, targets phonological differences between AAE and SAE, and focuses on children in the five- to eight-year-old age range.

Addressing the literacy needs of Indigenous children

Over the years, there has been a range of programs focusing on supporting the learning and enhancing the literacy outcomes of Indigenous children in Australia. They have differed in their pedagogy, focus and delivery. One example is Direct Instruction, as implemented by The Cape York Aboriginal Australian Academy (CYAAA) (McCollow, 2019), which was a partnership between the Queensland Department of Education and Training (DET) and Good to Great Schools Australia (GGSA) (a non-profit organisation), and has operated in the remote communities of Coen, Aurukun and Hope Vale. This case study took place between 2010 and 2017. Direct Instruction is a standardised pedagogical and

curriculum program developed and promoted by the US-based National Institute for Direct Instruction (NIFDI) Direct instruction involves explicit teaching of a curriculum based on sequenced sets of knowledge and skills, and ability grouping. It focuses on phonemic awareness, phonics skills, fluency, vocabulary and comprehension in literacy (Dow, 2011). Specific features of this approach include highly scripted lessons typically with students responding in unison, where learning is broken down into smaller discrete skills and tasks which the teacher controls. Students move onto the next skill when ready based on regular frequent assessment (Dow, 2011). McCollow (2019) indicated that data from this research is incomplete, and that NAPLAN results, as reported by the Australian Curriculum, Assessment and Reporting Authority, generally show that the CYAAA was not outperforming other remote Indigenous schools.

In 2005 the Social Justice Report (Social Justice Commissioner, 2005) prompted the Australian Government to implement the National Accelerated Literacy Program (NALP) (Covey, 2005) and a program called *MULTILIT: Making up for lost time in literacy* (Wheldall & Beaman, 1999) to address the gap in literacy between Indigenous and non-Indigenous children's learning. NALP, designed for whole-class implementation, and MultiLit (formerly MULTILIT), designed for one-to-one implementation, both contain a phonology component in the learning process.

NALP, developed for Aboriginal students in remote, high-transience schools, is an integrated literacy program that includes a small component on spelling that addresses phonics. The program was implemented from 2004 to 2008 in the Northern Territory, Australia, and was used in mainstream schools in South Australia from 2006 to 2013 (Commonwealth Government of Australia, 2014a), and in New South Wales from 2009 to 2011 (NSW Government, 2012). It has also been used in Aboriginal schools in South Australia, Western Australia and the Northern Territory (Commonwealth Government of

Australia, 2014b). According to advocates for this program (Cowey, 2005; Parkin, 2006), the relationship of sounds to letters is taught without losing meaning in the text that is studied. Throughout the program, phonology is intermittently taught to children through spelling. The chunking and decoding of words form the basis of this section of the program. NALP required substantial funding for teacher professional development prior to program implementation. While NALP had some positive results, concerns relating to the program's effectiveness and its reliance on intensive teacher professional development (Robinson et al., 2009; Tyler et al., 2009) led to a reduction in its use.

MultiLit (Wheldall & Beaman, 1999), in comparison, targeted low-progress readers from Year Two (seven to eight years old) and above through one-to-one tuition. It consisted of three components: word-attack skills, including phonics for decoding using a synthetic approach; sight words; and reinforced reading. Two studies (Wheldall & Beaman, 1999; Wheldall et al., 2010) reported that Indigenous students made gains that were similar to their non-Indigenous peers; however, according to the results of an evaluative study conducted by Wallace and her colleagues (2012) on behalf of Urbis Pty. Ltd. and commissioned by the NSW Department of Education and Communities, participation in this program resulted in faster and greater gains for some students and slower, minimal gains for others. This study collected and analysed information from a survey of 177 teachers and the NAPLAN results of the students participating in the program. The results indicated that the program was 91% effective for children below NAPLAN benchmarks, and 84.2% effective with Aboriginal children. Aboriginal parents/carers who observed improvements in their child's reading provided confirmation of these figures. However, only 16% of schools at the time of the survey (Wallace et al., 2012) had implemented the recommended number of sessions, even though the majority of the survey respondents believed the program was effective for improving reading. MultiLit was mostly funded under the National Partnership on Literacy

and Numeracy (NPLN) Agreement between the Australian Government and the NSW Government from 2009 to 2012 (Wallace et al., 2012). The findings from this evaluation by Wallace and colleagues (2012) found that literacy gains were made at a local level (school) but did not affect figures at a state level. The findings also indicated that schools did not implement the program as strictly as recommended, which caused discrepancies in the results. Due to these findings by Wallace et al. (2012), MultiLit was ultimately found to be unsustainable. However, the MultiLit company (Wheldall & Wheldall, 2014) have continued their work and have more focused on the early years of schooling, developing a number of initiatives:

- MiniLit (MultiLit, 2011) for younger students who are struggling with literacy, which has the same focus and pedagogy as the original MultiLit program developed for older students. MiniLit, however, does not have an oral language component linking pronunciation to literacy (Reynolds et al., 2007).
- InitiaLit (Wheldall & Wheldall, 2014) for children in kindergarten to Year Two, which was created to be implemented with whole classes (MultiLit, 2020).
- PreLit (MultiLit, 2012) for pre-schoolers, which does have a component of oral language embedded in the program in the form of structured storybook reading. This program does focus on the nuances of oral language, but without the specifics of pronunciation with individual students (Wheldall et al., 2016).

Although the Multilit company has endeavoured to enrich students' literacy learning and their programming has been demonstrated to be beneficial for low-progress readers (Ellis, Wheldall, & Beaman, 2007). A more recent report funded by Evidence For Learning (Quach et al., 2019) found that there was no difference between MiniLit and using the learning support group at 12 months post-randomisation, as measured by YARC (Reading

assessment which includes Passage Reading Accuracy, Reading Rate and Reading Comprehension). MiniLit does not address the strong link between literacy development and oral language, particularly in the form of pronunciation. As numerous studies (Ehrich et al., 2010; Nation & Snowling, 2004; Ouellette & Haley, 2013; Pullen & Justice, 2003; Torgesen et al., 1994) indicate, if children are to enhance their literacy skills, they need to make the connection between the articulation of a sound and the letter that represents the sound in writing. The sound then needs to be placed in context within both a word and a sentence (Frost, 2001).

Another program, ABRACADABRA (ABRA) (Abrami et al., 2019; Abrami et al., 2008), which was implemented in a variety of schools around the world and aimed at the development of children's core reading skills, was employed in the Northern Territory with both Indigenous and non-Indigenous students on three separate occasions (Abrami et al., 2019). ABRA (Abrami et al., 2008), a free software application that was developed in Canada for young school-aged children (Abrami et al., 2019), focuses on five overarching skills: phonics, phonological/phonemic awareness, fluency, vocabulary knowledge and reading comprehension. A large international research study of ABRA (Abrami et al., 2019) was carried out between 2008 and 2017 in 17 locations around the world. This research found that, in all 17 studies (program trials), including the three mentioned here, positive effects on reading occurred where ABRA was implemented, involving both Indigenous and non-Indigenous children, compared to the control conditions where ABRA was not used (Abrami et al., 2019; Ehrich et al., 2010; Wolgemuth et al., 2013; Wolgemuth et al., 2011).

A smaller study within the meta-analysis of ABRA was also conducted for a term in three primary schools in the Northern Territory (Ehrich et al., 2010). The grade literacy assessment determined that, overall, students made gains in early literacy skills, particularly phonological awareness and vocabulary processing. However, non-Indigenous children

attended class more frequently and performed significantly better in sound-matching and listening comprehension than their Indigenous peers. Non-Indigenous children's overall results were better than the Indigenous children's results (Ehrich et al., 2010). ABRA, despite having a positive impact on Indigenous children's literacy, does not appear to have been further implemented with Australian Indigenous children. This may be a result of the availability of technology or reliable internet access.

Another program focussing on early literacy was the Literacy Acquisition Program for pre-primary students (LAPS) which was implemented in the Kimberley region of Western Australia. This program involved a two-year empirical study (Scull & Hannagan, 2019) aimed to address the literacy achievement of five schools in the region through the adaptation of preventive processes involving systematic teaching approaches. The focus was on engagement with the community, teacher learning and classroom practice. This research was jointly funded by Waardi Limited and the Department of the Prime Minister and Cabinet, through the Indigenous Advancement Strategy funding program (2014). The program had its origins in the Language, Learning and Literature (L3) Intervention program (NSW Department of Education and Training, 1999-2000) which was designed to meet the learning needs of students experiencing vulnerability and disadvantage in New South Wales. L3 provided a strong conceptual base, a range of well-researched assessment tools, and respected teaching approaches (Scull & Hannagan, 2019). The L3 program was complimented with EAL/D literacy two-way teaching and learning strategies (Malcolm, 1999), the code-switching stairway (Berry & Hudson, 1997), and the understanding of re-schematisation of educational materials by EAL/D students (Sharifian & Department of Education WA, 2012). In addition, explicit phonics instruction (Emmitt, Hornsby, & Wilson, 2013) and a scaffolded approach (Pearson & Gallagher, 1983) that includes modelled, guided and independent learning opportunities were utilised. Evaluation of the program took place during the 2 years

of implementation and utilised interviews with teachers, support staff and principals, teacher questionnaires, written feedback from training sessions, and a reflective journal kept by the program's professional learning facilitator. On-going assessment tools were used to monitor student progress. One of many comments cited in Scull and Hannagan's article (2019, p. 333) states "Not just Aboriginal children of course but all of the children improved performance" (Principal 1, 2016). The adaptation of the L3 program enabled LAPS to be contextualised to meet the requirements of the students from the Kimberly while maintaining a focus on language development through text reading and writing.

Similarly, an Abecedarian early learning approach (Cooke & Piers-Blundell, 2019) within an established parenting support program titled 'Families as First Teachers' or FaFT (Cooke & Piers-Blundell, 2019) was implemented in 21 remote Indigenous communities across the Northern Territory. The Abecedarian Approach Australia (3a) as it became known, sought to bridge the gap between school knowledge and learning and Indigenous cultural knowledge and skills (Cooke & Piers-Blundell, 2019). The aim is to engage and empower Indigenous families and their young children in quality early learning experiences through increasing parental knowledge and skills. The program begins from birth and incorporates early learning, parent capacity building, literacy and numeracy at home and transition to preschool strategies. The program began in 2009 and within 2 years the impact was evident, with principals finding enrolments higher and parents wanting to enrol their children who had participated in the program. Early indications are that, largely as a result of the FaFT program, children are more 'school ready' when they commence school (Menzie's School of Health Research (Menzie's), 2013).

Other studies (Su et al., 2020; Timms et al., 2014; Williams & Jacobs, 2009; Williams et al., 2009) have pointed to the relationship between the high incidence of hearing loss and/or ear disease (otitis media) with poor academic achievement in literacy for young

Indigenous children. For example, Aithal and colleagues (2008) investigated the relationship between the high incidence of ear disease, hearing loss and native-language phonology on Australian Indigenous children learning SAE. Twenty-one SAE consonants were considered in a consonant-vowel (CV) context. The 18 participants between 12-13 years old were placed into three groups:

- 1) English-speaking non-Indigenous children without a history of hearing loss and otitis media;
- 2) Indigenous children speaking Tiwi (the language of the Indigenous people of Melville and Bathurst Islands off the Northern Territory coast) as their native language, without history of hearing loss and otitis media learning SAE as a second dialect; and
- 3) Indigenous children speaking Tiwi as their native language with a history of hearing loss and otitis media.

The results revealed that, with or without amplification, discrimination of consonants was “differentially affected by differences in language” (Aithal et al., 2008, p. 1). The study suggests that amplification assists in making speech loud enough to hear, but if the child struggles to discriminate the differences between his or her Indigenous language and SAE, phonological processing may still be difficult and affect reading and writing.

In response to hearing loss as a factor influencing Indigenous children’s capacity to learn English as a second dialect, the *PA-EFL: A phonological awareness program for Indigenous English as a foreign language students with hearing disabilities program* (Yonovitz & Yonovitz, 2000) was developed specifically for Indigenous children and focused on the impact of ear disease on low English literacy. The program was developed during 1996-97 in a remote Aboriginal community on an island off the north coast of the Northern Territory. The study was funded by the Australian Government in 1998 and provided

hearing-support services to 1,032 Indigenous children (155 of whom were primary students) in rural and remote communities. The program demonstrated remarkable literacy gains and provided insight into the relationship between low literacy achievement and ear disease. It also demonstrated the impact that phonological-awareness teaching can have on the literacy achievement of Indigenous children. However, the PA-EFL was designed mostly for secondary students, and didn't continue beyond the conclusion of the federal government funding.

The programs discussed in this section highlight the importance of explicitly teaching literacy skills, including both phonological awareness and SAE pronunciation to young Indigenous children. Each program enhanced children's literacy learning outcomes and provided support for Indigenous children's learning. However, for most, their use diminished following the government's withdrawal of funding. In addition, according to Abrami and colleagues (2019) and the Commonwealth Government of Australia (2014a), some of the programs described above do not seem to adapt to the needs of individual students or the local context in which they are learning. Language learning takes place during social interactions or contexts and based on this premise this research is based on socio cultural theory.

Sociocultural theory and its relationship to this research

There are three main theoretical approaches that explain the acquisition of language: the Behaviourist and social learning approach (Skinner, 1957); the Nativist approach (Chomsky, 1968); and the Interactionist approach (John-Steiner, Panofsky, & Smith, 1994) . The Interactionist approach is represented by the work of Bruner (1983), Halliday (1975), and Vygotsky (1962, 1978). Language learning, as argued by the interactionists, grows out of verbally-enriched and socially-mediated communicative experiences. Learning a language takes place in social contexts with others, which is the basis of Vygotsky's socio-cultural

theory (1962, 1978). Along with sociocultural theory, many second language acquisition theories have developed, such as the Acculturation Model (Barjesteh & Vaseghi, 2012), the Universal Grammar Hypothesis and Interlanguage theory (Menezes, 2013), Krashen's theory (Abukhattala, 2013), the Complexity theory (Larsen-Freeman, 2011), the Sheltered Instruction Observation Protocol Model (Daniel & Conlin, 2015) and the Cognitive Academic Language Learning Approach (Chamot & O'Malley, 1996). Sociocultural theory has been selected from these theories to inform this research as it recognises that language is learned to communicate and in so doing must be learned in a social context with a more experienced other. In Vygotsky's theory, children's cognitive development is affected by culture. Children acquire most of their knowledge (the contents of thought) through culture, which provides tools of intellectual adaptation, including language. These tools allow children to use their abilities in a way that is adaptive to the culture in which they live. Not only does culture teach children what to think but also how to think. Intellectual growth emerges out of dialectical processes where experiences are shared with more experienced people. Children can solve some problems by themselves, but more challenging problems require assistance from more experienced others. Vygotsky named this difference between what a child can do and cannot do by themselves as the Zone of Proximal Development (ZPD). Vygotsky insisted that not respecting this zone, either by helping children on tasks they can complete on their own, or by not helping enough on difficult tasks, impedes cognitive development. Language is the core type of interaction which allows the mentor to convey information to the child and is vital for the learning process. Other theories are either similar to this approach (Krashen's Theory of Second Language Acquisition and the acculturation model) or do not align with its principles (Universal Grammar Hypothesis and Interlanguage theory) (Friedrichsen, 2020). It follows that language is communication and language wouldn't take place if there were no social contexts in which to communicate.

The current study is underpinned by a synthesis of the philosophical and pedagogical links between Lev Vygotsky's socio-cultural theory (SCT) and the Zone of Proximal Development (ZPD) (Donato, 2000; Lantolf, 2000; Lantolf, Thorne, & Poehner, 2007) and Flege's Speech Learning Model (SLM) of second language acquisition (Flege, Frieda, & Nozawa, 1997).

From the perspective of Vygotsky and proponents of socio-cultural theory (SCT) (Kozulin, 1986; Vygotsky, 1978) language is learnt through social interaction. The process through which language takes on psychological function is known as 'internalisation' (Kozulin, 1990). Winegar (1997) explains that, "The essential element in the formation of higher mental functions is the process of internalisation. It is a negotiated process that reorganises the relationship of the individual with the social environment and generally carries it to future performance" (p. 31). The key to internalisation resides in the uniquely human capacity to imitate the intentional activity of other humans. It involves goal directed cognitive activity that can result in transformations of the original model (learning).

Vygotsky (1986, 1978) emphasises that learning language is a process. As children engage in activities where they are assisted by their mentor (more capable peer or adult) they learn methods of collaboration and cooperative dialogue (Kozulin, 1990; Swain & Lapkin, 2000, 2002). This process is described as the Zone of Proximal Development (ZPD). Lantolf (2000) describes the ZPD as the difference between what a person can achieve alone and what the same person can accomplish when acting with the support of someone else and/or cultural artefacts. As children engage in assisted activities, they transform what the expert is teaching them into what Vygotsky and Kozulin (1986) calls 'appropriations'. In the process of learning the student transforms information through imitation, collaboration and cooperative communication. According to this theory, children work collaboratively in the ZPD and thought is externalised through speech, in this way, speech becomes an object

(Lantolf & Appel, 1994). Language can then be examined, and through discussion, meaning is created. This metalanguage enables second language learning (Lantolf, 2000; Swain & Lapkin, 2000). Children using metalanguage build their knowledge of the language that they are learning. This is why discussion of language as an object will form part of the pedagogy in the study.

Play is another essential activity in sociocultural theory. It enables children to create a ZPD in which they operate at a level beyond their own present abilities (Vygotsky, 1978). Play is important for learning (Dias & Harris, 1990) and has been identified as a significant factor in both the first language acquisition process (Astington & Jenkins, 1999; Lohmann & Tomasello, 2003) and in learning a second language (Bell, 2012; Cook, 2000). Therefore, play forms an important part of the pedagogical process within this study.

Flege's Speech Learning Model (1997) supports socio-cultural theory on a phonetic level. It provides a way of understanding what takes place subconsciously when individuals interact and learn a second dialect. The Speech Learning Model (SLM) explains how when phonetic systems share common phonological space they will influence one another. According to the SLM, speech sounds in the child's second language that are different to those in their first language are easier to learn and allophones in the child's second language that are similar to those of their first language are more difficult to learn. This is because categories of similar sounds in the child's first language are developed before they learn a new allophone in their second language and, if a new allophone they are learning is similar to an already existing category, it is assimilated into the already existing category (Baker, Trofimovich, Flege, Mack, & Halter, 2008). An example of this would be that a child may pronounce /t/ for /θ/ as both sounds have been grouped into one category. It is then difficult for the child to read and write 'that' and 'truth' etc. The inconsistencies of the orthography make it more complex for second dialect learners to become literate (Nooteboom, 2007).

Thus the SLM provides an explanation for the differences that occur in the pronunciation of sounds in different dialects and supports the concept of creating a program that targets similar sounds.

The program which is at the centre of this research will be informed by a sociocultural approach to language learning. This means that pedagogical strategies include both the use of dialogue to discuss student's first and second dialect phoneme similarities and differences and motivational game-based activities. Language learning will take place with a more experienced mentor or teacher in the ZPD.

Summary

For nearly 20 years, research has shown that Australian Indigenous children struggle to attain the same literacy outcomes as their non-Indigenous peers (Australian Government, 2010; Frigo et al., 2003; NSW Department of Education, 2019; Thomson et al., 2017). Indigenous children are approximately two years behind their non-Indigenous cohort in gaining SAE literacy outcomes (David Unaipon College of Indigenous Education and Research, 2009; Hutton et al., 2010; Silburn et al., 2011). The difference in achievement widens as children move through their schooling (Ford, 2013). Since non-Indigenous and Indigenous children's development appears to be more closely aligned in younger children (de Lacey, 1971; Leigh & Gong, 2009; Zubrick et al., 2006), Zubrick and colleagues (2006) recommend addressing this difference in early-education programs. Zubrick et al. (2006) also found that Indigenous students who had trouble saying certain sounds were one and a half times more likely to have low academic performance. Other studies suggest that oral proficiency and phonological skills influence children's reading and spelling development (Greaney & Arrow, 2012; National Early Literacy Panel, 2008). Many studies reinforce this idea (Frost, 2001; Melby-Lervag & Lyster, 2012; Nation & Snowling, 2004; Verhagen et al., 2010). This literature, together with Nation and Snowling's research (2004), solidifies the

concept that the identification and consolidation of areas of difficulty in the articulation of SAE sounds could assist in alleviating the issue. For example, children who substitute /t/ for /θ/ write “toot” rather than “tooth” and may continue to do this as they have not become aware of the differences or do not possess the knowledge of how to pronounce the /θ/ sound. Once they become aware of how to pronounce the sound accurately, and remember how to articulate the sound, they should begin to write “tooth” accurately.

Children learn language by imitating the sounds produced by their carers (Hoff, 2003), and children’s phonological development typically progresses through specific stages (McLeod et al., 2001; Sander, 1972). Two studies conducted in Australia (Chirlian & Sharpley, 1982; Kilminster & Laird, 1978) determined that children have inventory completion by six to nine years of age. This highlights the need for local norms to maintain validity and emphasises a contextual factor affecting children’s mastery of sounds. For example, Indigenous children may not have experienced some of the consonant sounds of SAE before they attend school (Gould, 2008; Siegel, 2010). Although some children are still learning the sounds of their first dialect, if teachers wait to provide lessons in SAE phonology the child could miss the prime time to learn the consonants. Even though there is some knowledge of young children’s sound productions (Butcher, 2008; Eades, 1993, 2013; Tabain et al., 2004; Toohill et al., 2012), more research and support for learning SAE early in children’s schooling is required.

There are many differences between AAE and SAE in Australia, as there are many Indigenous languages, and these differences may cause further misunderstandings for both Indigenous children and their teachers. The major differences lie in the articulation of consonants (Butcher, 2008). There is clearly a need for localised research that targets the phonological differences between SAE and AAE with five- to eight-year-old children.

Many programs have focused on enhancing the literacy outcomes for Indigenous children in Australia. Many have been large-scale, government-funded programs (NALP, MultiLit, PA-EFL) that were scaled down or concluded at the end of their funding. Other programs, such as ABRACADABRA, that were research-driven were only implemented for the duration of the research. Other studies have focused on otitis media (Su et al., 2020; Timms et al., 2014; Williams & Jacobs, 2009; Williams et al., 2009), which does affect Indigenous children's learning, because, as emphasised by Aithal and colleagues (2008), amplification assists children in making speech loud enough to hear, but does not assist them in the discrimination between SAE sounds and AAE sounds.

The current study explicitly addresses the needs of Indigenous children learning SAE early in their schooling through the development of a phonological program. Furthermore, the design-based principles (Reeves, 2006) developed as a consequence of the study provide a set of guidelines for similar programs to be implemented in other learning environments.

Chapter 3

Approach and Methodology

The aim of the research described in this thesis was to investigate and design a set of guiding principles that enabled the development of a sociocultural phonological program (SPP) that could be taught in a variety of contexts. The primary focus of the thesis was the development of principles for such a program that are underpinned by empirical research. The steps involved in a design-based research (DBR) approach provided the means to collect information to inform the initial design of the program, to implement the program with a targeted group of Indigenous children, and to further refine the program based on their experiences and the program's outcomes. Such an approach provided the means to develop principles to become a set of evidence-based guidelines that could be implemented in a range of contexts, with the potential to have an impact on practice (Kelly et al., 2014; McKenny & Reeves, 2013; The Design-Based Research Collective, 2003). DBR comes from a pragmatistic point of view (Barab & Squire, 2004; Juuti & Lavonen, 2006). As Given (2008) states, "Truth is found in 'what works' and that truth is relative to the current situation" (p. 672). However, theoretical realisations and contributions are embedded within its essence. According to Bowler and Large (2008) DBR "combines research, design, and practice into one process, resulting in usable products that are supported by a theoretical framework" (p. 39) and The Design-Based Research Collective (2003) supported this statement by indicating that design-based research is "a coherent methodology that bridges theoretical research and educational practice" (p. 8).

This chapter describes the specifics of the methodology used in the development of design-based principles (Reeves, 2006) to achieve this purpose. The chapter concludes with a synopsis of particular ethical considerations that were addressed to protect the rights of the participants and the role of the researcher.

A design-based research approach

Design-based research initially emerged from the fields of science, engineering, and technology, where it focused on developing a product rather than on the process of design (Christensen & West, 2017). Ann Brown (1992) and Allan Collins (1992) were the first to apply DBR to educational research (Christensen & West, 2017). In education, there have been many attempts to provide a clear definition of design-based research (e.g. Cobb et al., 2003; Sandoval & Bell, 2004; Shavelson et al., 2003; van den Akker, 1999), with each providing different perceptions and understandings of the approach (Christensen & West, 2017). Collectively these articles identify the characteristics of DBR as having theoretical and practical design principles, and the researcher as having an active involvement in the design process. It can involve both qualitative and quantitative research methodologies (Christensen & West, 2017). DBR aims to develop products, contribute to theory, and inform practice (Bannan-Ritland, 2003; Barab & Squire, 2004; Sandoval & Bell, 2004). These attributes make it an appropriate approach to drive this study.

Brown (1992) and Collins (1992) are credited with being the researchers who developed the original characteristics of DBR (Christensen & West, 2017). Brown (1992) modelled her research on the procedures from design sciences such as aeronautics and artificial intelligence, and Collins (1992) created design experiments so that new technologies could be successfully implemented in classrooms (Christensen & West, 2017). Both researchers (Brown, 1992; Collins, 1992) describe the research characteristics of DBR. Brown (1992) identifies five basic characteristics that, for her, differentiate DBR from other design or research processes:

1. The design is engineered in an authentic, working environment.
2. The development of the research and the design are influenced by a specific set of inputs: classroom environment, teachers and students as researchers, curriculum,

and technology.

3. The design and development processes involve multiple cycles of testing, revision, and further testing.
4. The design research process produces an assessment of the design's quality and the effectiveness of both the design and the theoretical underpinnings.
5. The overall process should make contributions to existing theory. (Christensen & West, 2017, p. 7).

Although Collins (1992) proposed similar design characteristics, he did not consider “making a contribution to theory” as an essential characteristic (Christensen & West, 2017, p. 7). This is why the research within this thesis aligns more closely with the work of Brown (1992). However, since the 1990s, there has been a proliferation of models, each recognised by the steps or processes involved in their implementation. Some of these models include Bannan-Ritland's DBR Model (Bannan- Ritland, 2003), Reeves's development research model (Reeves, 2006), and Anderson and Shattuck's aggregate model (Anderson & Shattuck, 2012) and Easterday's six phase model (Easterday, Lewis, & Gerber, 2014). Bannan-Ritland's (2003) ILD framework was constructed based on DBR, with an emphasis on instructional design, product design, usage-centred design and diffusion of innovations. It focused on the product or program being developed and had a thorough evaluation phase, however, it had little provision for the exploration of the problem through interviews or other means other than the literature, and a greater emphasis on the development of theory was required for this research. Anderson and Shattuck's (2012) aggregate model reviewed DBR articles from 2002 to 2011 and presented an eight-step model, that did not provide provision for summative reflection and insight or theory development (Christensen & West, 2017). Easterday's six phase model (Easterday et al., 2014) clarified some of the DBR phases, particularly the investigation of the problem and the planning and building phases. However,

the development of theory is intermingled with the build phase and a summative reflection phase is not within the model. For this reason the model was not selected to provide the basis of the current research. I have thus selected Reeves's (2006) model to steer this thesis for the following reasons: it is widely used in education (e.g. Barab et al., 2010; Clarke & Dede, 2009; Cotton et al., 2009; Eady, 2010; Swan, 2007); it incorporates Brown's five basic characteristics (Brown, 1992); and it provides an opportunity for reflection on both the process and the product to develop theoretical and practical outcomes (Barab, 2006; Cobb et al., 2003). Eady (2010), for example, uses Reeves DBR model to generate 11 principles to guide the effective support of adult literacy learning in Australian Aboriginal communities using synchronous technologies. Like Eady, I followed Reeves's four phases to develop design-based principles founded on a review of the literature and consultations with authorities in the field; refined these through two implementations or iterations; and concluded with both practical and theoretical outcomes. Again, like Eady, I worked closely with the local Indigenous community to provide a transparent program that both encouraged children to build on their personal linguistic identity and enhanced their learning outcomes.

According to Cobb et al. (2003), for DBR to provide practical and theoretical solutions, it must embed effective processes and follow these to completion. Joseph (2004) argues that there are three important attributes of DBR that provide support and focus to the DBR process: the ability to pinpoint critical questions, the support DBR provides to the design process, and its ability to mould methods and design. She argues that these attributes give it a "powerful engine" (p. 241) to drive innovative work in education. Reeves's (2006) design research model embeds these attributes into what are generally understood as the four phases of DBR research:

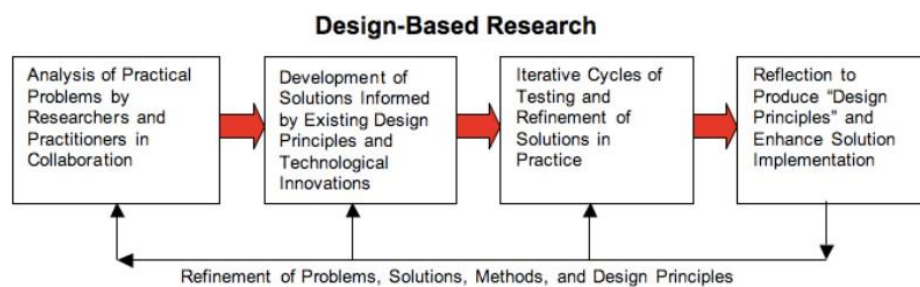
1. an initial phase where the researcher addresses a problem of interest through discussion with practitioners and study of scholarly literature;

2. a second phase where the problem is fully identified and the researcher designs an intervention that has the aim of solving the problem;
3. a third phase that focuses on refining and testing the intervention through repetitive cycles of data collection and analysis; and
4. a fourth phase where, using the principles refined in the third phase, the researcher reflects on the principles and makes any final adjustments.

These phases are outlined in Reeves (2006) and presented in Figure 1.

Figure 1

Design-based research diagram from Reeves (2006, p. 109)



Herrington et al. (2007, pp. 3-4) provide a more detailed sequence of each phase of Reeves's (2006) model, as a guide for doctoral research, which is presented in Table 1 (page 58).

Phase 1, as framed by Reeves (2006) in Figure 1, and sequenced by Herrington et al. (2007, pp. 3-4), commences with the identification and statement of the problem that drives the research. Analysis of the problem by researchers and practitioners in collaboration helps to clarify the problem and suggest possible solutions. The research questions are established, and the researcher investigates the problem by reviewing the literature; after which the researcher begins to draft the guiding principles. In Phase 2, potential solutions and draft principles are further developed to guide the design and description of the intervention.

Table 1

Reeves's (2006) DBR model as adapted in Herrington et al. (2007, pp. 3-4)

Phase	Element
PHASE 1: Analysis of practical problems by researchers and practitioners in collaboration	Statement of problem Consultation with researchers and practitioners Research questions Literature review
PHASE 2: Development of solutions informed by existing design principles and technological innovations	Theoretical framework Development of draft principles to guide the design of the intervention Description of proposed intervention
PHASE 3: Iterative cycles of testing and refinement of solutions in practice	Implementation of intervention (first iteration) Participants Data collection Data analysis Implementation of intervention (second and further iterations) Participants Data collection Data analysis
PHASE 4: Reflection to produce design principles and enhance solution implementation	Design principles Designed artefact(s) Professional development

In Phase 3, the researcher implements the intervention and refines the principles of the intervention according to the analysis of the data collected within each cycle, and then executes the intervention again, to further refine the potential solution to the problem. There are usually two or three iterative cycles within the third phase. The fourth phase involves reflection to produce design-based principles. This is where the principles or solution are further refined to enhance the solution for future implementation. At the conclusion of the fourth phase, design principles are generally distributed to the educational community,

including the participants of Phase 1; any suggestions for future research and practice in the area of inquiry are incorporated. It is at this point that DBR contributes both practical and theoretical solutions to a real-life problem.

DBR provides the means to research a real problem and to develop an intervention to inform better educational practices, and its empirical investigation can yield theoretical understanding that can inform the work of others (McKenny & Reeves, 2013). DBR focuses on generalising from the setting to the design process in natural contexts, and contributes to the improvement of education (Collins et al., 2004). It was ideally suited to the research described in this thesis, which sought to address a practical problem, produce enhanced educational processes and applications through empirical research, and contribute to second-dialect acquisition theory.

DBR and the design of a phonological program for Indigenous students

As indicated above, the purpose of this study was to design a consonant phonological program to enhance the literacy learning of five- to seven-year-old Indigenous children who speak English as a second dialect. Two questions guided the study:

- 1) What are the necessary underlying principles for a program that can support Aboriginal children's understanding and acquisition of second-dialect consonant sounds in the early years of schooling?
- 2) What are the contextual factors that need to be taken into account when designing such a program?

To address these questions, I used a DBR approach that involved an empirical study (Phase 3) to test the efficacy of a phonological program in a medium-sized school (approximately 350 students) in a semi-rural area in south-western Sydney. Thirteen percent of the students in this school were identified by their carers as being Indigenous, and the

majority of families were from low socio-economic backgrounds, according to school-based data provided to me by the principal. Students from the school, who were between the age of five and seven (as close in age as possible) and who had an Indigenous background (second-dialect speakers), were invited to participate in the intervention stages of the research. Permission was obtained from each child's carer, along with some personal information relating to their family background and learning.

Both qualitative and quantitative methods were used to collect and analyse data in the different phases of the research. The qualitative component was used to collect data that could capture knowledge and experience. It took the form of semi-structured interviews with Indigenous and non-Indigenous educational experts and Indigenous Elders, focus-group evaluative discussions, and information gathered during iterative cycles of program refinement through observations of, and conversations with, the teachers delivering the program. The quantitative component involved the collection of data via the Diagnostic Evaluation of Articulation and Phonology (DEAP) assessment (Dodd et al., 2002), a diagnostic tool to assess the students' needs in relation to their consonant articulation of sounds. The DEAP was administered before and after each iteration to identify the sounds that the children were either substituting with other sounds or omitting, and to measure the students' learning in relation to the pronunciation of these sounds.

Following Reeves's model (2006), as detailed in Herrington et al.'s (2007) description of the DBR approach above, my study was organised into four phases (Figure 2). The methods involved in each phase are described in more detail below and in the relevant chapters in the remainder of the thesis.

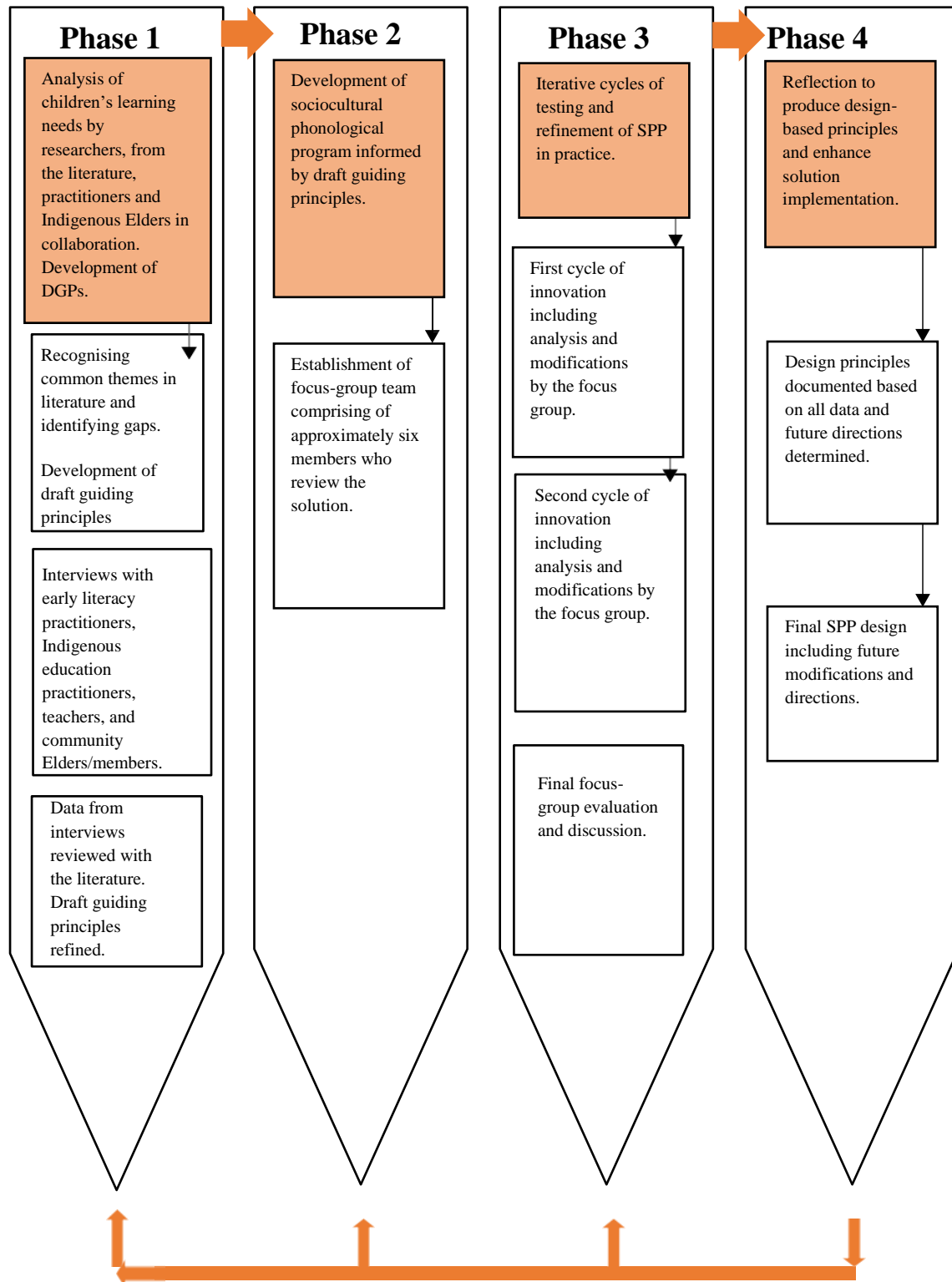
Phase One – Researching the draft guiding principles (DGPs)

The purpose of this first phase of the research was to determine the consonant-specific phonological differences between young first- and second-dialect learners in a semi-urban environment. The analysis of literature and the information generated through interviews with community Elders, teachers, and practitioners in the field took place in this phase to assist in the creation of the DGPs, which were in turn used to design the initial version of the sociocultural phonological program (SPP).

Two sub-questions guided this phase:

- 1) What type of consonant program, including pedagogy and content, does the documentary research indicate as necessary to support Indigenous children's understanding and acquisition of second-dialect sounds?
- 2) What type of phonological program, including pedagogy and content, do early literacy practitioners, teachers, Indigenous education practitioners, and Elders/community members consider necessary to support Aboriginal children's understanding and acquisition of second-dialect sounds?

These questions were answered through three strategies: 1) a literature review; 2) semi-structured interviews with educational practitioners, experts, and community; and 3) a comparison of interview data with the results of the literature review.

Figure 2*Design of research*

Literature review

I began the literature review by seeking out literature on current theory and practice in the field of language learning in social environments to identify the state of knowledge in the following areas: how second-language/dialect learners acquire new sounds; the differences between Australian Indigenous languages and SAE; and current relevant programs in the area and suggested pedagogies. For my initial searches in Google Scholar and the University of Wollongong's library database, I used combinations of the following search terms: "second language acquisition"; "language learning theory"; "second dialect"; "Indigenous ways of learning"; "Aboriginal English phonology"; "phonological awareness", "oral language development"; "reading and spelling development"; "phonological differences between Australian Aboriginal English (AAE) and SAE"; and "assessment of SAE sounds in minority groups in Australia". Results from these searches subsequently informed the development of the DGPs. As will be discussed in greater detail in Chapter Four, each section of the literature review prompted a DGP for the program, with a total of 11 DGPs established as the first version of those for the program. These became the building blocks on which the questions for the semi-structured interviews with the authorities in the fields of second-language/dialect acquisition, literacy, pedagogy and Indigenous pedagogy were designed.

Interviews with educational practitioners and Indigenous Elders

In the second section of Phase 1, I sought knowledge on program content, cultural identity, and appropriate pedagogies from relevant authorities. To obtain the most useful information, a wide range of participants were sought (Miles & Huberman, 1994), including early-literacy practitioners, teachers, Indigenous education practitioners, and Indigenous community Elders/members. Participants were recruited through purposeful sampling, which focused on selecting knowledgeable participants whose contribution was likely to address the questions under study (Patton, 2002). Those approached included: Indigenous educators,

speech pathologists, teachers with experience working in more-remote communities, teachers working within the context of the study, university lecturers in the field of literacy and Indigenous education, and academics in the area of second-language phonology and oral language development. These educational practitioners' breadth of experience and knowledge made for a large range of responses and allowed similarities in responses to emerge as relevant. Initial contact with practitioners was made by personal communication, usually by phone contact. During this conversation I sought their interest and nurtured their potential participation. This was followed by an email (Appendix A), which explained the research and encouraged participation. Finally, I contacted potential participants through a variety of personal communication methods (phone calls, text messages, and email) to answer any questions they may have had and organise a time for their interview.

From the 36 individuals contacted, 15 educational practitioners and Indigenous Elders volunteered to be involved in semi-structured interviews. The interviewees came from a variety of backgrounds and geographical areas (Table 2).

Table 2

Interviewee attributes

Number of participants	Occupation	Indigenous/non-Indigenous
5	Primary teacher	non-Indigenous
3	Aboriginal Education and Engagement Officer	Indigenous
5	University lecturer	non-Indigenous
1	Primary teacher	Indigenous
1	Speech pathologist	non-Indigenous

The participants came from both Indigenous and non-Indigenous backgrounds, and all had some experience teaching or working with Indigenous children, with some also having

expertise in literacy development. I was looking for a range of expertise and knowledge about Indigenous children's language learning and development, particularly in oral language development. The speech pathologist in this study approached me, as she had heard I was developing a program to support Indigenous students at school. She had extensive experience working with Indigenous children. Other speech pathologists I found in the local area were not interested in joining the research. I sought primary teachers with a range of experience working with Indigenous children; for example, those who themselves were Indigenous and those who had worked in schools with different proportions of Indigenous student enrolments.

The interviews used open-ended questions designed to collect information relating to each participant's experience with successful phonological activities and pedagogy (Appendix B). Questions were formulated in ways that allowed the participant to elaborate on the information being discussed. This structure allowed for opportunities to pose further exploratory questions to gain additional insights (Galletta, 2013; Whiting, 2008). Informed consent to participate was obtained, information was kept securely, and confidentiality was maintained. Member checking (Creswell, 2007), where the participant has an opportunity to agree or disagree to the completeness and accuracy of the information obtained in their interview, was used to ensure that participants felt they were being treated with dignity and respect. Interviewees who didn't live locally were invited to participate in the semi-structured interviews and focus-group interviews via Skype, telephone calls, or email.

At the end of each interview, participants were asked if they would like to volunteer to join the focus group and assist in the refinement of the program by providing feedback. These focus groups would take place at the end of Phase 2 and following each cycle of SPP implementation (iteration), to further improve the SPP and the DGPs that would eventually form the design-based principles (DBPs). Six of the 15 participants agreed to join the focus

group discussions:

- three non-Indigenous generalist primary teachers from the research site;
- one non-Indigenous university academic from South Australia (focus on Indigenous education, visual methodologies, and arts methodologies);
- one Indigenous primary teacher with a wide variety of experience, including working in remote areas, who was currently working in the western Sydney area; and
- one non-Indigenous university academic from New South Wales (focus on Indigenous education, particularly child language acquisition).

The other nine interviewees decided not to participate in the focus groups due to other commitments. This did not limit the research in any way, as there were sufficient numbers to form a focus group and the interviewees who volunteered to participate were a good representation of the participants as a whole.

The interview format followed a simple guideline of questioning (Appendix B) that focused on pedagogy, both Indigenous and non-Indigenous; content for a phonological program; and Indigenous children's pronunciation of SAE. I also included questions about how to value children's identity and culture. Firstly, there were some questions to help the participant feel at ease and begin the conversation. These questions allowed the participant to talk a little about their work in education. These were followed by questions to elicit information regarding the potential pedagogy and content for the SPP. These questions were guided by the results of the literature review and were adapted to each participant's background and area of expertise. Interviews were audio-recorded and transcribed professionally by Digital Data and Research Solutions. Transcriptions were confirmed and their use agreed to by the interviewees.

I analysed the interviews by reading through each transcript several times until themes began to emerge. I colour-coded these common themes within the transcripts, wrote the transcript information into a table, and colour-coded it accordingly. Each colour-coded theme was further refined based on the number of times it had been discussed during the interviews. Using the colour coding within the table, I counted the number of times each theme was represented and recorded these findings in the Interview Analysis document (Appendix C). The common themes that were found to be most frequent in the interviews were refined further to ensure that all of the relevant data had been captured in the DGPs.

Comparison of these themes with the DGPs from the literature review

The Interview Analysis document (Appendix C) was compared with the DGPs from the literature review. The DGPs were further refined through the addition of themes that supported the enhancement of pedagogy, content, and engagement. This resulted in the splitting of one of the DGPs into two to ensure that the information within was clearly defined and adding an extra DGP to include the use of haptic techniques³. The resulting 13 DGPs informed the design of the SPP in Phase 2. Chapter 5 describes the program design and Chapters 7 and 8 give its results.

Phase Two – Development of the sociocultural phonological program (SPP)

Phase Two involved the design of the SPP. In this phase, the focus group of six educational practitioners and Indigenous Elders were invited to provide feedback on the SPP design. As several researchers have pointed out, studies that have included the stakeholders in the development phase have been more successful (Nutbrown et al., 2005; Timmons, 2008), and from a DBR perspective it is vital that the experts be considered as equal contributors to

³ Haptic techniques systematically link touch, movement, and sound; they are further discussed in Chapter 4.

the design of the program (Leeman & Wardekker, 2011; McKenny & Reeves, 2013).

As well as informing the DGPs, more-detailed information from the interview analysis (Appendix C) was used directly to inform the practical application of the SPP (Appendix F). As a starting point for the development of the SPP, on the basis of the information from the 13 DGPs and my analysis of the interviews, I designed an SPP design framework (Appendix D details how each DGP was embedded in the framework), which provided me with instructions about what I needed to take into account in designing the program, as required in terms of appropriately sequenced pedagogy and relevant content. It informed what I needed to do for students to enhance their oral pronunciation.

I sent the focus-group members a copy of the 13 DGPs and the SPP design framework with a question: – “Do you think developing the SPP from the framework will be effective?” They responded favourably, and agreed that it would be an effective way to proceed. I wrote a program (the SPP), from which individualised programs could be constructed for each student, using the headings in the SPP design framework – “What is required?” and “What needs to be done?” – to sequence the program. I inserted time at the beginning of every lesson to discuss the importance of the students’ first language. I then organised the second focus-group meeting. One week before the meeting, I sent each participant a copy of the SPP (Appendix F), the interview analysis page from Appendix C, and the SPP design framework in Appendix D, along with the DGPs and four discussion questions:

1. Will the SPP be effective? Why/why not?
2. How can the SPP be altered/adjusted in order to improve its effectiveness prior to its implementation?
3. How do you think the SPP should be implemented?

4. Do you have anything you'd like to discuss?

I organised a meeting time where all participants were available to provide feedback. Skype was offered as an alternative to meeting in person where necessary. The meeting took place at the end of the school day, as this was the time that most participants were available. Four participants attended in person and two via Skype. At the beginning of this initial meeting an Acknowledgement of Country was given and individual group members were acknowledged and introduced. This was followed by my outlining the reason for the meeting. Some discussion guidelines were established to ensure that all participants were seen as equal and that all information was valued. For example, participants were asked to listen to and respect everyone's ideas and comments, as I considered all feedback to be important and of equal value. A reminder was given that it was the topic or idea being discussed, not the person who put the topic forward, and that we all needed to support one another in order to provide positive feedback. These customs are well recognised in the Aboriginal community (Lavalley, 2009; Woolley et al., 2013).

After this discussion, the group had no more comments to make; I reminded them that they could talk to me about the discussion questions at any time. I gave them an opportunity to make any other contributions privately if they preferred their comments to remain anonymous. During all interactions I ensured that we were following the six core principles of the local Aboriginal community: spirit and integrity, cultural continuity, equity, reciprocity, respect, and responsibility (National Health and Medical Research Council, 2018a, 2018b).

From this first meeting I anticipated that the focus group would suggest amendments to the SPP design and further discussions would be required. However, the focus group accepted the SPP design in its original form and further meetings were not required at this stage of the study.

Data analysis for this phase was based largely on the data collected from the focus group and discussions with focus-group members through email. All communication was recorded, transcribed, and stored. Systematic analysis of these communications, through the coding of comments, was maintained, and acted upon if the majority of focus-group members agreed. This ensured that the SPP design remained strong.

Phase Three – Iterative cycles of testing and refinement of the SPP in practice

In Phase Three of DBR, the solution (in the case of this study, the SPP) is implemented through several trials or iterations. In this study, there were two cycles of implementation. Following Iteration 1, in consultation with the focus group, I used the children's outcomes from the first iteration to evaluate the SPP. The focus group and I considered how and if the SPP required refinement prior to the second iteration. The focus group decided that the SPP, from which individualised programs could be constructed for each student, could be delivered to another group of children, without any amendments, using a different trained primary teacher (Iteration 2).

Participants

The SPP was implemented with five children in each of the two iterative cycles (10 children in total). The children were chosen using criterion sampling (Palinkas et al., 2015; Patton, 2002), based on their individual phonological/literacy needs, their age (five to seven years; as close in age as possible), and their identification as being Indigenous. The children's names, as written in this thesis, have been changed to protect their anonymity. The demographics of the school limited the number of available students, and most of the children in the age range who met the criteria participated in the program. The parents of these children were informed about the purpose of the study, and invited to participate in an interview and to allow their child to participate in the program. Demographic data about age,

background, gender, and cultural background and the children's learning needs were collected during a semi-structured interview with each child's parent. These interviews were conducted in a private setting within the school, and were 10 to 15 minutes long. Written permission was obtained prior to the commencement of these interviews and then for the children's subsequent participation in the SPP.

The children's family heritages were diverse and their family language backgrounds were all different. Despite this, each family indicated in these interviews that there were no other languages (foreign) spoken at home, possibly because Indigenous languages can be seen as a lesser dialect or as deficit (Eades, 2013), and may not be officially acknowledged by the family, either verbally or in documentation. Indigenous families who only speak English at home, may speak a different dialect of English at home and could influence the dialect of their children. Indigenous families may also be unaware that they are speaking another dialect (Meakins, 2008). The way in which some of the Indigenous families interacted during school events and Aboriginal Education Consultative Group (AECG) meetings suggested the use of an Indigenous dialect of English, and in less formal situations carers spoke about how they used home language in the privacy of their own home. Carers spoke about their dialects in more informal situations and when they felt that it would assist their child's learning. All of the carers proudly acknowledged the language of their Indigenous ancestors, even though they did not report speaking it at home, and happily provided information about their family heritage. More specific and detailed information is provided in Chapter Six.

Each of the two iterations was taught by a different teacher. This was due to the restrictions placed on the researcher by the school. The expectations of the school environment and timetabling also affected each iteration cycle. The teacher for Iteration 1 was responsible for teaching other programs within the school and only had three mornings a week available in her timetable to teach the SPP. The teacher of Iteration 2 was a part-time

teacher who only worked two days a week and was timetabled to teach the SPP in the mornings, concluding at 12:30 p.m. each day. The principal preferred that with all of the other commitments at the school and the demands placed on the children's time that the SPP be taught only on the two mornings that the part-time teacher was available.

Data collection

Diagnostic Evaluation of Articulation and Phonology assessment (DEAP). To specifically identify each student's learning needs and their progress as a result of their participation in the program, an assessment tool was required. Many assessment tools were considered for this task; however, I found that most of the assessments were norm-referenced to the United States, Canada, or the United Kingdom, indicating that they were standardised to reflect the populations of these countries, not Australia. I needed to find an assessment tool that had a standardised sample that accurately reflected the Australian population.

Assessments that did not reflect this criterion, and were consequently rejected, included:

- The Clinical Assessment of Articulation and Phonology (CAAP2) (Secord & Donohue, 2014), where over 1,700 students from the United States and Canada in 32 states and three provinces participated in the standardisation; this cohort closely resembled 2000 United States census data in terms of race, gender, and age.
- The Goldman-Fristoe Test of Articulation (GFTA-2) (Goldman & Fristoe, 2000), where over 3,500 examinees aged between two and 21 were tested at over 300 sites nationwide in the United States. A representative sample of 2,350 subjects was used for developing the normative scores.
- The Khan-Lewis Phonological Analysis (KPLA 2) (Khan & Lewis, 1986), where over 3,500 examinees aged between two and 21 were tested at over 300 sites nationwide in the United States. A representative sample of 2,350 (1,175 male and 1,175 female)

subjects were used for developing the normative scores.

- The Phonological Assessment of Child Speech (PACS) focused on British and American phonology and possessed little normative information (Butcher, 1987).
- The Sutherland Phonological Awareness Test (NSW Department of Education and Training, 1968) was considered but was found to assess phonological awareness rather than articulation and phonology.

The only assessment that appeared to meet the needs of this study was the Diagnostic Evaluation of Articulation and Phonology assessment (DEAP) (Dodd et al., 2003; Dodd et al., 2002). This was norm-referenced to the Australian population and evaluated both articulation and phonological processing. It was standardised in the UK and Australia between 2001 and 2002. The socio-economic status, geographical areas, and age of those being tested were all considered. According to Dodd et al. (2002, p. 38), t-tests that matched UK and Australian children aged between five and six indicated that there were no differences between the two groups. *The Manual of Diagnostic Evaluation of Articulation and Phonology* (Dodd et al., 2002) provides information about error patterns and differences between single sounds, words, and continuous speech production. Speech sounds are sampled twice for validity and consonants are considered in different places within a word e.g., initial, medial and final. It assesses all consonantal articulations in accordance with the International Phonetic Alphabet (Harrington et al., 1997; International Phonetic Association, 1999), which is used to identify and classify articulation approximations. The DEAP consists of: a) a picture-naming task, which includes 60 pictures and covers all consonants in syllable initial and final positions; and b) a picture-description task, where children are shown amusing pictures containing items from the naming task and are expected to use the item names in connected speech.

An approximation (a speech sound that is similar to a target sound but produced with some phonetic variation) occurs when there is a difference between the administrator's realisation (pronunciation) and the child's pronunciation of the SAE sound. The articulation is elicited a second time through questioning and, if the child does not articulate the appropriate word for the item (for example, the child may have used "push chair" instead of "pram"), they are asked to imitate the word. If the imitation is an approximate, the sound is placed in the student's consonant inventory. Dodd et al. (2002) state that the reliability of the assessment is based on test-retest reliability where there is a 0.001% difference in testing, and inter-rater reliability, which refers to the consistency between examiners for their transcription and analysis of the sounds. In Dodd et al.'s (2002) collection of data the mean percentage of agreement on all consonants was well over 90%.

The validity of the DEAP assessment is considered in two ways: content validity and concurrent validity. Content validity considers whether the assessment adequately measures the speech ability when comparing the child's age to the age and articulation of their peers. The DEAP assessment items sample all syllable initial and final consonants in English, and a range of syllable shapes, lengths, and contexts (single words to connected speech). Concurrent validity is a comparison of the DEAP assessment with other tests that are presumed to measure the same skill. The DEAP assessment scores of 53 children were correlated with the Edinburgh Articulation Test (EAT) (Anthony et al., 1971) and the percent of correct scores of the DEAP and the EAT were compared. The correlation coefficient was highly significant ($r=0.95$, $p<0.001$), demonstrating that the two tests are significantly correlated.

I am familiar with the DEAP assessment through extensive experience in previous research in the same locality. In my previous study I assessed the DEAP articulations of 22 Indigenous children and 22 non-Indigenous children, who were from three different schools

(but mostly from the same context as the research described in this thesis) and constructed inventories for each child to assist their oral development. Throughout this process I regularly discussed my analysis with my supervisors, one of whom is an expert in L2 (second language/dialect) pronunciation, and adjusted my procedures as per their recommendations. After considerable consideration, I selected the DEAP assessment to specifically identify each student's learning needs and their progress in this study. I administered the test to the children in this study; my previous training assisted in the reliability of these assessments.

Observations and work samples. Lesson observations through the use of video recordings provided evidence about both lesson delivery and pedagogy. The teacher video-recorded the lessons by placing the camera in a position to record their interactions with the students. I watched these recordings and discussed them with the teacher to enhance lesson delivery or to retrieve assessment data. I documented these conversations with the teachers, as well as wrote notes; these provided valuable information to improve the program implementation. I collected work samples of the students' writing and sound work, and took photos of game-related activities. I also collected and analysed dictation passages containing the target sounds. The dictation passage read: "The giraffe and the thin frog both brushed their teeth, with toothpaste and a feather, over the sink near the fridge" It contained the focus sounds /θ, ð, dʒ/ and the substitution sounds /f, v, t, d, b, p/ in most phoneme positions. The work samples were used to compare the focus sounds in the SPP with the children's dictation passage to ascertain if the children had transferred their knowledge of pronunciation to their writing.

Together with the results of the DEAP assessment, this wide range of data provided a set of evidence to ascertain student progress and the program's value.

Data analysis

Iteration 1. Students' articulation accuracy (ability to pronounce sounds without substitution, omission, distortion, or addition) in the initial DEAP assessments of Iteration 1 was compared to their accuracy in the final assessment, and the children's oral progress was determined. The work samples were used to compare the focus sounds in the SPP with the children's dictation passage to ascertain whether the children had transferred their knowledge of pronunciation to their writing.

I enlisted the assistance of the focus group in the evaluation of Iteration 1 by using the following questions:

1. Why was the iteration effective/not effective?
2. How can the SPP be altered/adjusted in order to improve its effectiveness prior to the next implementation (iteration)?
3. How do you think the SPP should be implemented?
4. Do you have any suggestions to enhance the SPP or its implementation in Iteration 2?
5. Do you have anything you'd like to discuss?

Following this evaluation of the SPP's effectiveness in Iteration 1, it was ready to be refined through the implementation of Iteration 2.

Iteration 2. This cycle was completed using the same procedures as the first iteration. The DEAP assessment provided focus consonants for the SPP. For this iteration, the dictation written sample was completed by the children before the iteration began as well as at its conclusion. Two students were in kindergarten, and, because of the complexity of the dictation passage, were asked to write the letter to match the focus sound and a short word for each focus sound. For example, /dʒ/ could be 'j' and the word 'jet'

At the conclusion of Iteration 2, the focus group was given a copy of the analysis of the DEAP pre and post assessment, comparison results from Iteration 1 and Iteration 2, the students' pre and post dictation samples of Iteration 2, the DGPs, and the following discussion questions:

1. Why was the iteration effective/not effective?
2. How can the SPP be altered/adjusted in order to improve its effectiveness for future implementation?
3. How do you think the SPP should be implemented in the future?
4. Do you have any suggestions to enhance the SPP or its implementation in the future?
5. Do you have anything you'd like to discuss?

Using the same meeting format as Iteration 1, the results from Iteration 2 were discussed and the value of the SPP as a learning tool ascertained. Particular emphasis was placed on the replicability of the SPP and the refinement of the DGPs.

Phase Four – Reflection to produce design-based principles

The purpose of this final section of DBR is to reflect on the DGPs and develop them further in response to the data collected in the intervention phase of the research, with a view to producing design-based principles to guide the development and implementation of similar programs in the future. For my research this meant further analysis and consideration of the recommendations from all the data collected during the iterations and focus-group interactions. From this analysis a further DGP was added to encourage the effective implementation of the SPP in other settings. In keeping with the DBR process, the DGPs were finalised and became design-based principles (DBPs). The DBPs were refined through the iterative cycles of the implementation of the program (Reeves, 2006). The SPP was also

finalised and presented to the school community as an evidence-based program to support young Indigenous second-dialect learners.

Ethical considerations

To ensure that the participants in the study were protected and that the findings were achieved with integrity and honesty (Punch, 2006), ethics approval was gained from the University of Wollongong's Human Research Ethics Committee (HE15/004). Approval was obtained from the State Education Research Approvals Process (SERAP No: 2014274) in the Department of Education and Communities in New South Wales, Australia (Appendix E contains the approval letters). Research followed the 14 principles set out by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATIS) (2012) document "Guidelines for Ethical Research in Australian Indigenous Studies"; these guidelines are grouped under the broad categories of "rights, respect and recognition; negotiation, consultation, agreement and mutual understanding; participation, collaboration and partnership; benefits, outcomes and giving back; managing research; use, storage and access; and reporting and compliance" (p. 1).

All participants were informed in writing about the study and their participation was requested verbally. They were informed that participation was on a voluntary basis. This information was given out in "simple language" and included details regarding the study's methodological procedures, opportunity to withdraw without consequences, potential risks and how these risks have been minimised, privacy and confidentiality, and how to address any problems that may arise during the study (Mertens, 2005; Punch, 2006).

Permission to participate in the study was sought from practitioners, community members, parents, and children. Parents signed a consent form for their child to be included in the study. Permission was sought from all stakeholders involved; this included permission

to audio-record the interviews and DEAP assessment, and video-record the lessons. To maintain privacy and confidentiality (Creswell, 2007; Punch, 2006), locations and participant identities were replaced by pseudonyms, and the data was stored in a locked filing cabinet, where it would remain for seven years, and was only accessible by the researcher.

Validity

DBR has a solid ecological validity, as the learning already takes place in learning ecologies (schools); thus, the methods chosen provide a better measure of what researchers want to examine (Anderson & Shattuck, 2012; Bakker & van Eerde, 2015). Researchers like myself work closely with teachers to optimise the learning environment. My study was set in an educational environment where the research methods chosen sought optimal analysis of results.

Miles and Huberman (1994) inspired Bakker and van Eerde's (2015) description of internal validity in DBR, which is determined through iterations that are tested in some way or triangulated with other data material such as field notes. In this study the information obtained from interviewee participants was transcribed and sent to the participants for verification. This process allowed the interviewees to confirm the information and verify it to be correct. During the iterations the results were verified through audio and video recordings. An external educator who was not involved in the study checked that the information was accurately recorded. Children's work samples and photos as well as class teacher discussions provided further evidence of authenticity.

External validity, or the "generalisability of the results in DBR" (Bakker & van Eerde, 2015, p. 9) depends largely on how easily the results from the iterations within the research can be useful within other contexts. The analysis of the results from Iteration 1 indicated that no alterations to the implementation of Iteration 2 were necessary. Moreover, both iterations resulted in similar findings, providing a strong indication that the results could

be replicated in other contexts. Also, the SPP (Appendix F) along with the DBP and the thesis document provide a detailed report for future implementation in other contexts.

Reliability and the role of the researcher

I coordinated the research, conducted the semi-structured interviews, trained the teachers who were to teach the iterative cycles of implementation, created the SPP, and assessed the student participants using the DEAP assessment tool. I had experience in the DEAP tool, as I had used it previously to assess 42 children in a pilot study leading up to this research. For the current study, I needed to be flexible enough to alternate roles in order to facilitate data collection and analysis. My role varied from being a supervisor, helping and supporting the primary teacher in SPP implementation, to being the interviewer, asking questions and collecting information from participants. My role also involved assessing children's phonemic articulation using the DEAP assessment, and leading focus-group interactions, including meetings and electronic interactions. I commenced data collection in December 2014, and completed the second iteration in the middle of 2017. Throughout this time, I engaged in reflective practices, such as asking an educator not involved in the research to check my work and maintaining a research diary to encourage my own awareness of my role in the research process (Greenbank, 2003). I spent considerable time working in and with the community.

Creswell and Miller (2000) emphasise that researchers who are in the field for at least four months solidify evidence, build trust, find gatekeepers to allow access to people and sites, establish rapport with participants, and give back to the people involved in the study. I have worked diligently with and in the community for approximately 10 years. In my role within the school, I have successfully liaised closely with the staff and parents. This in itself not only helped in learning local culture and assisted in checking for misinformation, but also built trust with participants (Creswell, 2007). Through my Aboriginal Education Consultative

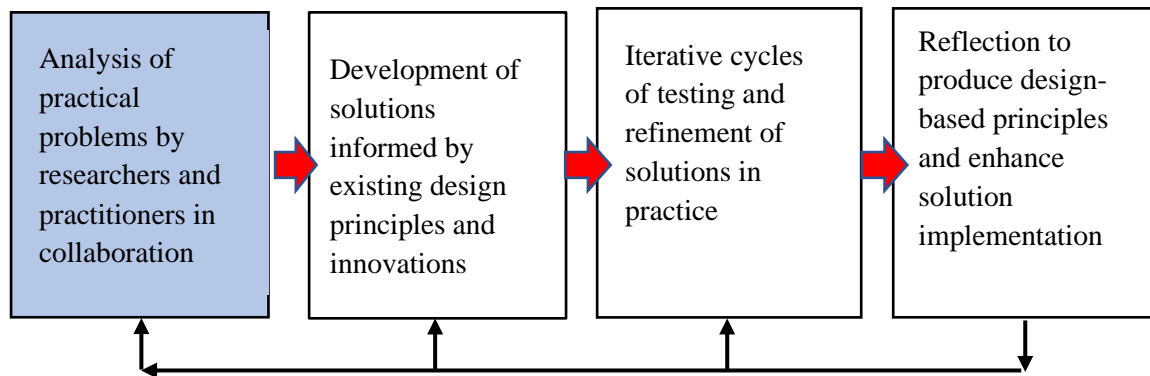
Group (AECG) membership, the principal's willingness to implement the SPP (both iterations) within the school and the parents' willingness for their children to participate in the research, I would argue that I have established trust and rapport with the community.

The scope of the research is dependent on the researcher's coordination of the phases or steps within the research and the quantity of data. As mentioned above, I coordinated the study, ensuring that each step and phase was carried out in the right sequence and in the appropriate manner. I trained the teachers who implemented the lessons within the iterations and provided the equipment to video-record the lessons. I made myself available to answer their questions, and the lessons were taught without my intervention. However, if requested, assistance was provided. The lessons were discussed with the teacher during both impromptu discussions and weekly meetings. The lessons were also reviewed by and discussed with an external educator who considered each step of the research in order to provide feedback. These actions endorsed internal reliability, or the degree of how independently of the researcher the data are collected and analysed (Bakker & van Eerde, 2015).

Interrater reliability (Bakker & van Eerde, 2015), concerning the degree of agreement between researchers, was supported through the content analysis of the interviews, discussion and agreement between focus-group members, and the independent colleague who checked the research, including meeting records, for agreement. External reliability or replicability (Bakker & van Eerde, 2015) is possible through the use of this thesis documentation, where the SPP, DBPs, and processes form a guide for future researchers to track the learning process, understand the reasons for the choices made throughout the study, and participate in similar research in different contexts.

Chapter 4

Phase One – Development of Draft Guiding Principles



Refinement of Problems, Solutions, Methods, and Design Principles

Note: Based on design-based research diagram by Reeves (2006, p. 109)

This chapter describes how the draft principles that guided the development of the sociocultural phonological program (SPP) were derived. As discussed in the methodology chapter, Phase One of the DBR described in this thesis involved analysing the problem from the perspective of the literature while at the same time taking into consideration the expertise of educational practitioners and Indigenous Elders. The first step in the creation of the draft guiding principles (DGPs) was a review of literature on language learning in the field of language and literacy to identify the necessary characteristics of the SPP. The chapter commences with an analysis of research and scholarship in language acquisition and learning, language learning pedagogy, and the cultural implications of second-dialect learning. The results of this analysis produced the first set of the DGPs. The next section of the chapter describes the second step in Phase One, in which the DGPs were further refined through the analysis of the information obtained from interviews with educational practitioners who were knowledge holders in the field of language learning and literacy acquisition and/or Indigenous ways of knowing and learning.

Section One – Literature review

In the process of reading the relevant literature, I investigated the theoretical frameworks and empirical research underpinning current thinking and practice in the area of second-language (L2) learning. This included theories and research related to suitable pedagogical practices, second-dialect learning, dialectal differences, and cultural factors that might affect the design and delivery of the SPP. The information extrapolated from these investigations help to formulate the DGPs for this study.

Situating the draft guiding principles

Current theory on language learning recognises that children learn language through interaction in social environments (Mitchell et al., 2013). This is evident in both Piagetian and Vygotskian theories of language development, both of which underpin modern educational practices. Piaget considered language to be a tool used to express knowledge that children acquired through interaction with the environment (Hickmann, 2001; Inhelder & Piaget, 1964; Piaget, 1950). Vygotsky's focus, in comparison, centred on language-learning through social interaction (Lightbrown & Spada, 1994). Vygotsky's sociocultural approach (Vygotsky, 1962) to learning language has remained the preferred theory since 1986 (Mitchell et al., 2013), when Kozulin's (1986) edited book further explained Vygotsky's book *Thought and language* (Vygotsky, 1962). In this explanation of Vygotsky's work, Kozulin thoroughly teases out Vygotsky's thinking and translates it into English, allowing both greater access to his theory and a more in-depth understanding of his work. Lantolf (1994) later applied the Vygotskian sociocultural framework to second-language acquisition and produced an edited book (Lantolf & Appel, 1994), and has since applied sociocultural theory to many publications (Lantolf, 2000; Lantolf et al., 2007). Sociocultural theory has subsequently become the expected underlying theory in L2 research (Mitchell et al., 2013)

and is used in research on second-language acquisition today (Lantolf & Tsai, 2018; Poehner et al., 2017; Yang & Qian, 2017). The preference for sociocultural theory (Lantolf & Tsai, 2018; Poehner et al., 2017; Yang & Qian, 2017) can be explained by its emphasis on learning through meaningful mediated social interactions. Sociocultural theory makes it essential for L2 teaching to focus on meaningful communication and embraces the underlying premise that language is learned through social interaction with a more-experienced mentor. This is one of the reasons it has remained the dominant theory over many years (Poehner et al., 2017; Toth & Moranski, 2018). The idea that language is learned in social contexts with more-experienced others becomes an important starting point for the design of the SPP. Therefore, this well-researched and widely accepted theory informed the first DGP of the SPP.

DGP 1: Language is learned from interaction with a more-experienced person in a social context.

An integral aspect of Vygotsky's sociocultural theory (Vygotsky, 1962, 1978) is the notion that when children learn through engagement in activities where they are assisted by their mentor (more-capable peer or adult) they learn methods of collaboration and cooperative dialogue (Kozulin, 1990; Swain & Lapkin, 2000, 2002). Vygotsky describes this process as occurring within the Zone of Proximal Development (ZPD) (Vygotsky, 1962, 1978). Lantolf (2000) depicts the ZPD as the difference between what a person can achieve alone and what the same person can accomplish when acting with the support of someone else and/or cultural artefacts. As children engage in assisted activities, they transform what the expert is teaching them into what Vygotsky in Kozulin (1986) call "appropriations". In the process of learning, the student transforms information through imitation, collaboration, and cooperative communication. According to this theory, children work collaboratively in the ZPD and thought is externalised through speech. Speech becomes an object (Lantolf & Appel, 1994), which enables language to be examined, and through discussion, meaning is

created. This metalanguage enables L2 learning, as children using metalanguage build their knowledge of the language they are learning (Lantolf, 2000; Swain & Lapkin, 2000). Empirical studies into using metalanguage as a tool to teach literacy have demonstrated enhanced student learning outcomes (Couper, 2011; Daffern, 2016; Gebhard, Chen, & Britton, 2014; Heron et al., 2021; Su Chai Siik & Hawkins, 2013). A research study by Basturkmen, Loewen and Ellis (2002) focusing on form, considered lessons with and without metalanguage. They found when metalanguage that did occur it was usually of a non-technical nature and was more likely to be used by the teacher. It occurred variably, and in student-initiated discussion there was a significant relationship between the presence of metalanguage and the presence of uptake. Similarly, research by Couper (2011) found that teaching pronunciation through the use of metalanguage and critical listening helped students become more aware of their pronunciation, which in turn, provided more accurate pronunciations. Finally, Dorit and Anat (2009) completed a themed study of five programs in order to determine the impact of metalanguage on language learning. The study found that the informed use of metalanguage as an educational tool can have positive outcomes at school. These findings from the empirical research support the use of metalanguage within program development.

These ideas about learning align with my own experience as a primary school teacher in semi-urban Australia. Throughout my 28 years of teaching experience, I have found that children need to talk about their language use and practice their oral skills to develop them into literacy skills (to be able to comprehend and compose texts). It is quite common for my students to write the way they speak. For example, a student wrote “The doggie took a baff” instead of “The doggie took a bath” because it was the way he pronounced the word ‘bath’. In order to understand the need to change the way he wrote the word, he needed to know that he had articulated part of the word differently to SAE. This child needed to talk about the sounds

/f/ and /θ/, including how to say them and when to use them. The child was an L2 learner, so discussion about how the sounds are articulated in his L1 and the application of the sounds in SAE was also needed (Cummins, 2001; Siegel, 2006). This concept of “talking about talk” in the ZPD thus informed the second DGP for this study.

DGP 2: Using metalanguage while in the ZPD will enhance language learning.

Similar to the use of metalanguage, language play (Broner & Tarone, 2001; Cekaite & Aronsson, 2005) and repetition (Rydland V. & Aukrust V., 2005) are both characteristics intrinsic to children’s language production and have an impact on the development of an L2 (Philp J. et al., 2008). Vygotsky (1978) argues that play enables children to create a ZPD in which they operate at a level beyond their own present abilities. Play enables problem-solving and strategic thinking (Dias & Harris, 1990; Whitebread, 2010; Wood, 2010). It has been identified as an important factor in both first language acquisition learning processes (Astington & Jenkins, 1999; Lohmann & Tomasello, 2003) and in learning an L2 (Bell, 2012; Cook, 2000). Language play as defined by Cook (2000), includes a wide variety of activities, as any communication can take place playfully through manipulations of linguistic form, meaning, or use. These utterances are commonly marked with signs of pleasure or laughter around the utterance or interaction (Sullivan, 2000). Lyster and Saito's (2010) meta-analysis of 15 studies analysing the effect of oral corrective feedback revealed greater student improvement when students gave freely constructed responses in tasks. Furthermore, Norris and Ortega's (2000) meta-analysis of 49 studies of explicit and implicit types of instruction found that highly controlled, as well as less controlled tasks are “equally effective” when teaching target features to language learners (p. 501). It follows that teaching articulation through play would provide a more engaging environment for young children (Cekaite & Aronsson, 2005; Galletly, 2000). Language play has been identified (Chapman, 2003; Franc & Subotic, 2015; Galletly, 2000; Promerantz & Bell, 2007; Pullen & Justice, 2003; Smith &

Pellegrini, 2008; Van Scoter, 2008) as a productive pedagogical strategy in teaching language acquisition.

In my own primary-school classes, I have observed children using play to both experiment with sounds and learn articulations. An interesting example of experimental play involved a small group of children in kindergarten who were playing with transportation toys. They seemed to create their own words and sounds just to communicate the way the vehicles moved. This gave them opportunities to practise sounds and have fun. For example, one child was using the word “thud” to describe the way the backhoe hit the soil. He used “fud” and often corrected himself and said “thud”. Another child in the same group was using “vroom” to explain how the car sounded. Occasionally he said “room, room” but laughed and corrected himself. These are examples of children rehearsing or internalising sounds and using words or sounds for fun. Play is thus an important factor in enhancing language acquisition and, as a result, it informed the third DGP.

DGP 3: Use of language play is a preferred approach for successful language acquisition.

As children play with a language they learn to pronounce its different sounds (Hoff-Ginsberg, 1997; Rescorla & Schwartz, 1990). This playing with sounds within the ZPD with more-experienced others provides help and guidance to learners and enhances learning. According to Vygotsky (John-Steiner & Mahn, 1996), learning is the transfiguration of socially exchanged deeds into internal processes. It is supported by both the scaffolding of learning and communication with a mentor within the ZPD, subsequently enabling a student to perform tasks or reach targets that they would not achieve on their own (Daniels, 2001). Gibbons (2015), for example, found that where teachers’ expectations of their students were high, English language learners’ achievement was also high.

In my dual role as Assistant Principal and instructional leader, which requires observations and supervision of teachers in a mentoring capacity, I have witnessed on numerous occasions the positive impact of teachers' expectations on learner performance. I have similarly found that teachers who have high expectations of their learners use scaffolding to structure their lessons and to build deep understandings. Considerable research suggests that high challenge and high support in the presence of scaffolding benefits children (Hammond, 2008; Newmann, 1996; Walqui, 2006). Bruner (1978) describes scaffolding as, "the steps taken to reduce the degrees of freedom taken in carrying out some task so that the child can concentrate on the difficult skill he/she is in the process of acquiring" (p. 19). There are many scaffolds utilised that support children's language acquisition (Gibbons, 2015; Rodgers, 2005; Rogoff, 1990; Scull & Bremner, 2013; van de Pol, Volman, & Beishuizen, 2010). For example, Rogoff (1990) describes four ways teachers can effectively support student learning. Firstly, the teacher structures the difficulty level of the task. Secondly, learning takes place through collaborative participation in problem solving. Thirdly, the teacher helps to focus the learner's attention to the task. Finally, the teacher motivates the learner. Although Rogoff's scaffold is applicable to this research, it is general and could be applied to any learning task. Vygotsky (1978) advocates that mutual social interaction between the teacher and the student is vital for improved learning outcomes. In the Individualised Meta-phonological Awareness Instruction model (I-MAI) as described by Philip & Noyan (2018), which is analogous to the lessons within this research, social interactions between the teacher and the students surround the instructional tools. Hogan and Pressley (1997) identify five types of macro-scaffolding features:

1. Offering explanations,
2. Modelling of desired behaviours,
3. Inviting student participation,

4. Verifying and clarifying student understandings, and;
5. Inviting students to contribute clues.

Children move through these scaffolds of learning in their ZPD (which is set by their teacher and the learning program) until they are in control of the phoneme, indicating they have internalised the learning or ways to contribute to the interactions (van de Pol et al., 2010). Scaffolding is necessary to support such learning; thus, it became the focus of the next DGP.

DGP 4: Scaffolding of learning and communication are useful strategies to build capacity.

Scaffolded learning and language play in socially rich environments are important considerations to enable children to learn SAE sounds; however, when young Australian Indigenous children first come to school, where SAE can be a second-dialect environment, research has shown that they often fall behind their non-Indigenous peers academically (Thomson et al., 2017). This may be attributed to their transition to school and the availability of specific programs and trained mentors to support them in this process.

Indigenous children's lesser exposure to the target cultural environment in which SAE is used and taught can be further explained through an understanding of what takes place subconsciously when individuals interact and learn a second language/dialect. To this end, there are four main general models of cross-language speech perception that theorise on how children subconsciously learn a second dialect: the Speech Learning Model (SLM) (Flege, 1995; Flege et al., 2003); the Native Language Magnet Model (Kuhl, 1991, 1992); the Perceptual Assimilation Model (Best, 1994, 1995), which has been enhanced to PAM-L2 (Best & Tyler, 2007); and the Natural Referent Vowel (NRV) framework (Polka & Bohn, 2011). The Native Language Magnet Model (Kuhl, 1991, 1992) has been extensively

criticised due to the paucity of research to support it and its focus on specific inflexible prototypes or categories regardless of the speaker's dialect or variation of dialect (Frieda et al., 1999; Lively & Pisoni, 1997; Tyler et al., 2014), while the primary focus of the NRV is on vowels; as this research investigates consonants, it is not applicable to the current research study. Both of these models were consequently judged to be unsuitable to underpin the development of the SPP. Likewise, the use of the original Perceptual Assimilation Model (Best, 1994, 1995) and its modified version (PAM-L2) were rejected for three reasons. First, empirical support for the original model has focused on adults rather than children (Best, 1994; Guion et al., 2000); second, it is based on perception rather than on the learning of L2 speech sounds; and, third, although the original model has been modified by Best and Tyler (2007) to become the PAM-L2, there has been minimal empirical evidence to support these enhancements. Some more-recent studies using PAM-L2 and comparing it with the SLM demonstrate that the SLM is for speech production and the PAM-2 for perception. However, a section of the PAM-L2 does provide an avenue to consider speech production, and studies using it reveal similar findings to the SLM in adult L2 learners (Nagle, 2019; Shi & Shih, 2019; Shi et al., 2019).

In contrast to these three models, Flege's Speech Learning Model (SLM) (Flege et al., 1997) showed a great deal of promise as a source of theory and practice for the development of the SPP. The SLM is primarily concerned with learning speech, focuses on individual phonemes rather than on contrasts such as minimal pairs, and addresses production rather than perception. For these reasons, it was judged to better support children's learning and articulation of a second dialect. The SLM also supports SCT on a phonetic level. The SLM explains how, when phonetic systems share common phonological space, they will influence one another. The L1 phones that are already learnt and are similar to L2 phones often have an impact on the pronunciation of the L2 phones. The strength of the L1 (or first dialect)

representations influence L2 (or second dialect) production accuracy. For example, an L2 or second-dialect learner may pronounce /d/ instead of /t/ and in so doing say ‘had’ instead of ‘hat’ when trying to articulate the latter. According to the SLM, speech sounds in the child’s L2 that are different to those in their first language are easier to learn, whereas allophones in the child’s L2 that are similar to those of their L1 are more difficult. This is because categories of similar sounds in the child’s L1 are developed before they learn a new allophone in their L2 and, if a new allophone they are learning is similar to an already existing category, it is assimilated into that category (Baker et al., 2008). An example of this would be when a child pronounces /t/ for /θ/, as both sounds have been grouped into one category. It is then difficult for the child to read and write “that” and “truth”, as they are likely to use the letter “t” to represent both /t/ and /θ/. Thus, the SLM supports the concept of teaching similar sounds as well as the varying ways letters represent the sounds of SAE. This important aspect of teaching and learning informed the next DGP.

DGP 5: Sounds that are similar in the child’s first and second dialects should be explicitly taught together.

At school Indigenous children may experience sounds they have not heard before, while being expected to articulate these sounds to facilitate learning. Not only are they expected to use them in speech, they need to use them to learn to read and write in their second dialect. The skill of segmenting or breaking down sounds into letters, such as /k/, /a/, /t/ for ‘cat’, and the orthography of SAE make it yet more complex for second-dialect learners to become literate in their L2 (Bradley & Bryant, 1983, 1985; Nooteboom, 2007). The sound /k/, for instance, can be represented by the letters “c”, “cc”, “ck”, “cch”, or “k” respectively in the words “bacon”, “soccer”, “back”, “zucchini” and “bake”. Segmenting sounds into their phonemes not only requires learners to attend to constituent sounds but to learn to use orthography appropriately to read and write. The skill of segmenting speech is a

prerequisite for phonemic awareness, which in turn is a prerequisite for reading and writing (Frost, 2001; Hipfner-Boucher et al., 2014). Phonological awareness, as mentioned earlier, is an important feature of any early reading program. It is an awareness of individual phonemes and teaching phonological awareness is not the same as phonics teaching (Lane, Pullen, Eisele, & Jordan, 2002). It provides a support structure for children to learn from, as they gain knowledge in phonics (Anthony & Francis, 2005; Pullen & Justice, 2003; Torgesen, Wagner, & Rashotte, 1994). Phonemic awareness is a subset of phonological awareness and is the most important phonological element for the development of reading and spelling (Goswami & Bryant, 1990; Griffith & Olson, 1992; Konza, 2011). Kansa explains, “It is the ability to focus on separate, individual sounds in words, the phonemes.” (p. 1) There is considerable evidence to support the link between phonemic awareness acquisition and language learning (Byrne & Fielding-Barnsley, 1995; Castle, Riach, & Nicholson, 1994; Comeau, Cormier, Grandmaison, & Lacroix, 1999; Ehri, Nunes, Williows, Schuster, & Yaghoub-Zadeh, 2001; Vandervelden & Siegel, 1997). For example, a study by Ouellette and Haley (2013) demonstrated the importance of early phonemic awareness programs through explicitly examining phonemic awareness skills in relation to phonics instruction. A total of 57 kindergarten children participated in the study and were tested prior to the commencement of the study and one year later. Results revealed that oral vocabulary and alphabetic knowledge were co-related to larger segmental phonological awareness and phonemic blending in kindergarten, whereas in grade one oral vocabulary was the only measure that predicted a variance in phonemic awareness. The result was most pronounced for segmenting as opposed to blending. This study highlights the importance of oral vocabulary during the acquisition of phonemic awareness, the necessity to teach phonological awareness before phonics programs and that teaching should also foster opportunities for oral vocabulary growth. Children with a strong phonological awareness can detect, match, blend, segment,

and manipulate speech sounds (Torgesen et al., 1994). Phonological awareness encourages children to manipulate speech sounds within words. It is therefore necessary for children to develop their production of SAE sounds to enhance their literacy skills (Ehri et al., 2001; Ouellette & Haley, 2013; Torgesen et al., 1994). There is considerable evidence to suggest that oral proficiency and phonological skills influence children's reading and spelling development (Ehri et al., 2001; Ehrich et al., 2010; Nation & Snowling, 2004; Pullen & Justice, 2003; Zubrick et al., 2006). This literature highlights the importance of enabling learners to blend and segment sounds to effectively use them in reading and writing; it thus provided the foundation for the next DGP.

DGP 6: Blending and segmenting sounds, along with placing sounds in context, should be used in the process of teaching.

The process of segmenting and blending sounds in itself is complicated. Another layer of complexity is added when the sounds that are similar in a student's first and second dialect are taught with blending and segmenting. For example, if /d/ was in the child's L1 but /θ/ was only in their L2 and the child was being taught at school, learning to join and break up the sounds in the words /dɪl/ and /θɪl/ would be more complicated for this student than for other students in the class. Determining the differences between a child's first dialect and SAE can be further complicated by the realisation that there are more than 120 Indigenous Australian languages being spoken today (Marmion et al., 2014). Thirteen of these languages are considered to be "strong", passed down from generation to generation, whereas around another 100 Indigenous languages are considered severely or critically endangered (Marmion et al., 2014). The phonological features of one Indigenous language, however, are not always shared by other Australian Indigenous languages (Butcher, 2008; Malcolm, 2002). Based on this information it was difficult to focus the SPP narrowly. Nonetheless, research studies (Butcher, 2008; Eades, 1993; Eagleson, 1982; Kaldor & Malcolm, 1979, 1982, 1991; Sharpe,

1977) have uncovered some similar findings in their analyses of the differences between SAE and Australian Aboriginal English (AAE), an overarching term to describe a variety of Indigenous English dialects. During my time working with and assessing Indigenous children's pronunciation I compared 22 Indigenous and 22 non-Indigenous children's articulation, using the DEAP assessment, in the same general region in which the current study takes place. I found that the majority of differences in these students' articulation fell into the obstruent group, particularly fricatives. Further evidence of the importance of the phonological differences between AAE and SAE was provided by Toohill et al.'s (2012) review article, which includes a table indicating phonological differences between AAE and SAE, and which researcher revealed each one (Butcher, 2008; Eagleson, 1982; Kaldor & Malcolm, 1979, 1982, 1991; Sharpe, 1977; Williams, 2000). This article (Toohill et al., 2012) together with other research on the differences between SAE and AAE (Dodd et al., 2002; Eades, 1993, 2013), assisted in the selection of the key consonants for the program. This compilation of research provided the basis for the next DGP.

DGP 7: Phonological differences between AAE and SAE should be used to guide learning.

For the optimal learning of consonants, it is necessary to establish a match between the learner's characteristics and personal identity or agenda (Brophy, 1999). According to Christie (2001), for many Indigenous people, the term "identity" encompasses a range of constructs including the essence of time and place, language, stories, place names, songs, designs, dances, gestures, etc. This means that the learning needs to match the learner's prior knowledge, identity, and experiences, be recognised as relevant learning by the student, and have content that is motivating and within their cognitive ZPD (Donato, 2000; Lantolf, 2000; Lantolf et al., 2007; Vygotsky, 1962). To accomplish all of this, participants should first be assessed to identify individual variations in their phonological articulations. The necessity of

performing a diagnostic assessment to determine the child's consonantal articulations thus informed the next DGP.

DGP 8: Assessment highlights relevant learning and assists in the development of program design that builds on students' prior knowledge.

Research focusing on language pedagogy has also provided evidence of the huge impact that first dialect has on both educational achievement and equality (Alim, 2005; Baugh, 2007; Peltier, 2010; Wolfram, 1998). An important consideration is the valuing of the student's first dialect within the school environment (Adger et al., 2007; Newman & Yasukawa, 2005), as it links closely to children's personal identity (Morgan & Clarke, 2011; Norton & Toohey, 2011). This has been recognised by the Australian government in various documents recognising individual rights (Commonwealth of Australia; Department of the Prime Minister and Cabinet, 2017; Council of Australian Governments, 2009). Explicitly discussing with children the importance of their first language will, ideally, help them feel personally valued by their teachers and school community. Such conversations also serve to individualise learning, which Lewthwaite et al. (2015) emphasises as crucial to enhancing Indigenous people's learning and supporting their acquisition of a second dialect (Cummins, 2001). For children to feel that their first language is valued, this notion requires frequent explicit acknowledgement. The program design therefore needs to ensure that children are assured that teachers both understand and value their use of a different language at home and that the sounds they learn at school are not taught to diminish their first language, but rather to support them to acquire the dialect or language used at school. Based on this premise, the following DGP was proposed:

DGP 9: Ongoing affirmation and valuing of a child's first language is crucial.

Accepting and valuing a child's L1 encourages learning, as it demonstrates respect for the child's identity and culture (Sharifian, 2008; Williams, 2011). This builds trust and cultivates an environment that is conducive for learning (Cahill & Collard, 2003; Norton & Toohey, 2011). An example of this, in my own teaching, was when I explained to a student that both her home language and school language were both valuable, just used differently. We talked about how /θ/ was used in the word "bath" in SAE while /f/ was used in her language. She happily went home and explained her new learning to her mother. For optimal learning, children need to be taught using pedagogical processes that are compatible with their methods or ways of learning (Scull, 2016; Yunkaporta, 2009). Educational researchers have determined that Indigenous learners share several commonalities in the way they prefer to learn in comparison to non-Indigenous learners (Lloyd et al., 2015; Osborne, 1996; Scull, 2016; Yunkaporta, 2009). Yunkaporta (2009) developed and implemented eight Indigenous pedagogical pathways for learning based on his personal learning experience and research. Despite his small research base and limited data, his Indigenous pedagogy was, according to the 50 teachers involved in his study, effective within the schools he visited. His research was based heavily on Indigenous pedagogies which are not always practicable in the school setting but valuable as they describe ways of teaching and learning within Indigenous culture. These Indigenous ways of learning can support all learning journeys and subjects. They align closely with the Quality Teaching Framework (NSW Department of Education and Training, 2006), fit easily into lessons, and are culturally appropriate. They include:

- approaching learning through narrative,
- mapping processes explicitly with diagrams,
- maximising non-verbal, intra-personal, and kinaesthetic skills,
- using images to support the understanding of concepts and content,
- using eco-pedagogy and place-based learning,

- producing innovations by combining systems and thinking laterally,
 - scaffolding and modelling learning, working from wholes to parts and parts to wholes, and
 - centring local viewpoints and applying learning for community benefit
- (Yunkaporta, 2009).

According to Yunkaporta (2009), each of these pathways to learning can be implemented independently of the others or with only some of the other pathways. He suggests that it is unlikely that they would all be implemented at once. Considering the nature of second-dialect learning and the nature of Indigenous learners, scaffolding and modelling learning, working from wholes to parts and parts to wholes, using images to support the understanding of concepts and content, along with learning through narratives are all practical pedagogies that underpin language-learning practice.

Understanding how Indigenous people learn and what pathways or processes they access during language acquisition is paramount to this research. Yunkaporta (2009) defines specific processes to access learning. These are specific techniques Indigenous people may use to gain meaning. He talks about working from wholes to parts and parts to wholes within the process called “Deconstruct/Reconstruct” (watching then doing). This process is suitable for application in this research, as it has a supportive structure that enables the teaching of pronunciation and spelling. Teaching commences with whole words or sentences. A purpose is then provided for teaching the content; for example, how the sound is pronounced in AAE and in SAE is identified, and how to use it is modelled. It is unpacked and students work through activities to learn it. From there students use their strengths, with the support of the teacher, to put the sound back into words and create meaningful texts. It could also include the process of modelling, teaching through guided experiences, and then doing the task independently. David Wray, who has published over 50 books on aspects of literacy teaching,

and is best known for his work in developing teaching strategies to help children access the curriculum through literacy, identifies “four basic insights into the nature of the learning process from research over the past 20 years or so” (Wray, 2010, p. 53):

- 1) Demonstration, where the expert models the skilful behaviour to be taught.
- 2) Joint activity, where the expert and the learner share the activity. This may begin with the expert retaining responsibility for the difficult parts while the learner takes on the easy parts, or they could simply take turns in the activity. The expert may withdraw from the activity but is ready to rejoin if the learner experiences difficulty.
- 3) Supported activity, where the learner undertakes the activity alone but under the watchful eye of the expert, who is always ready to step in as necessary. Scaffolding may be used to assist in this step to transition the learner to increasingly independent learning.
- 4) Individual activity, where the learner assumes sole responsibility. Some learners may move more quickly through this stage than others, and teachers remain sensitive of this (Wray, 2010).

This direct method of teaching initially allows students to observe and interact with the content without risk. This supportive process described by Wray (2010) enables learning and began from the Vygotskyan (1962, 1978) idea that children first experience a particular cognitive activity in collaboration with an expert, or teacher. Then the child begins to take over some of the work under the close supervision of the expert. Eventually, the child assumes full responsibility for the task and the expert becomes a supportive audience.

Research by Taylor and Cox (1997) and Wray and Lewis (1997) demonstrate the success of this type of learning.

The other pedagogies considered pertinent from Yunkaporta's (2009) research, such as scaffolding and modelling learning, have been covered in previous DGPs. Using images and narratives to support learning are initiatives that, although self-explanatory, have not been previously discussed despite being equally relevant to language-learning pedagogy. Yunkaporta (2009) describes narratives and images as "written yarns" (p. 19) and highlights that "we connect through the stories we share" (p. 21). Narratives personalise learning and draw on the cultures represented in the learning experience (Clay, 2005). These pedagogies provide important pathways to learning and are incorporated in DGP 10.

DGP 10: Indigenous children should be taught in a manner that uses images to support understanding, involves teacher modelling and working from wholes to parts, uses narratives to enhance learning, and suits their learning preferences.

Along with Yunkaporta's (2009) "Eight Ways of Learning", there are other Indigenous pedagogies that foster an inclusive learning environment. Lewthwaite et al. (2015), for example, describe two practical pedagogies that they argue are relevant to Indigenous students' preferred ways of learning. These pedagogies include fostering positive relationships and allowing students to understand the holistic value of their learning prior to focusing on specific content. Aspects of culturally relevant pedagogies highlighted within other literature include: an emphasis on providing teachers with cultural training to foster rapport with students (Bond, 2010; Harrison & Murray, 2012); the use of concrete material in experimental tasks that link with lived experiences (Bissett, 2012; Frigo et al., 2003); and time allotted to trial-and-error activities (Bissett, 2012; Brogden & Kelly, 2002). These pedagogies help to provide an environment where students' backgrounds and cultures are

included, and a base on which the pathways selected from Yunkaporta's "Eight Ways" (2009) can sit. These selected pathways of learning, although applicable to pronunciation learning, are not specifically designed for this purpose. For this reason, Scull's (2016) six pedagogical principles, which are designed to help Indigenous children develop literacy skills, were also considered for inclusion.

Scull's (2016) six pedagogical principles for early literacy learning, developed for Indigenous students, were formed in consultation with three teaching and learning programs that had strong community and financial support, and had beneficial literacy outcomes for young Indigenous learners in remote areas of Australia. These programs included: "The Abecedarian Approach for Australian preschool children" devised by Sparling (2011); "Literacy Acquisition for Pre-primary Students based on Language, Learning and Literacy" program (L3) implemented in NSW Department of Education and Training schools from 1999-2000 to date (Phillips et al., 2001, 2004); and "Reading Recovery" (Clay, 2002). It is unfortunate that Scull didn't complete a wider appraisal of literacy programs, as this may have diversified her findings; however, the following principles (Scull, 2016, pp. 56-60) were taken as useful guides for my research:

- Maintain children's Indigenous language and ensure opportunities to become proficient speakers of English to build dual language competence as a strong foundation to successful literacy learning outcomes.
- Value and respect Indigenous practices and connect the curriculum to community knowledge and experiences to allow students to see the relevance of literacy learning.

- Provide multiple levels of teaching support, of increasing intensity, to ensure the best designs for meeting Indigenous students' literacy learning needs are available.
- Recognise the complexity of the literacy acquisition processes and assure all Indigenous students gain access to the skills and strategies that allow them to engage in critical, constructive literacy practices.
- Acknowledge the importance of expert teaching and provide ongoing teacher professional development to ensure quality literacy teaching and learning for all Indigenous students.
- Invest in programs with a record of success and engage in research to monitor and improve the effectiveness of teaching and programs specific to meeting Indigenous students' learning needs.

Scull's (2016) work, despite her small research base, provides a source on which to build a specific language pedagogy, targeting young Indigenous children. These principles overlap with the holistic environmental pedagogies compiled by Lewthwaite and his colleagues (2015) and reiterate the importance of valuing Indigenous culture, language, and practices. They serve as a reminder to ensure that Indigenous children have access to the skills and strategies for language acquisition, which is an underlying aim of this research. Scull's (2016) principles highlight the importance of expert teaching, underpinned by teacher professional development, which provide multiple levels of support of increasing intensity to children. It is extremely important to involve expert teachers who have an extensive knowledge of and experience in teaching the pronunciation of SAE sounds, and understand and value Indigenous culture, language, and practices. This became the next DGP, which seeks to ensure quality teaching.

DGP 11: The involvement of expert teachers who have extensive theoretical and practical knowledge of the teaching of SAE pronunciation, who understand and value Indigenous language and cultural practices, and who provide multiple levels of support is vital.

Involving expert teachers to train young Indigenous children using relevant, appropriately scaffolded content in an environment that values Indigenous culture and language is at the core of this research. It provides quality teaching in supportive environments and promotes learning.

Summary of draft guiding principles based on the literature

Eleven DGPs were created from the literature to be used as a guide to the next step: developing and refining the DGPs based on the information collected from the educational experts. In summary, the DGPs derived from the literature were as follows:

DGP 1: Language is learned from interaction with a more experienced person in a social context.

DGP 2: Using metalanguage while in the ZPD will enhance language learning.

DGP 3: Use of language play is a preferred approach for successful language acquisition.

DGP 4: Scaffolding of learning and communication are useful strategies to build capacity.

DGP 5: Sounds that are similar in the child's first and second dialects should be explicitly taught together.

DGP 6: Blending and segmenting sounds, along with placing sounds in context, should be used in the process of teaching.

DGP 7: Phonological differences between AAE and SAE should be used to guide learning.

DGP 8: Assessment highlights relevant learning and assists in the development of program design that builds on students' prior knowledge.

DGP 9: Ongoing affirmation and valuing of a child's first language is crucial.

DGP 10: Indigenous children should be taught in a manner that uses images to support understanding, involves teacher modelling and working from wholes to parts, uses narratives to enhance learning, and suits their learning preferences.

DGP 11: The involvement of expert teachers who have extensive theoretical and practical knowledge of the teaching of SAE pronunciation, who understand and value Indigenous language and cultural practices, and who provide multiple levels of support is vital.

Section Two – Interviews with educational practitioners and Indigenous Elders

After considering the literature, I looked for further concepts that would assist in the provision of quality content and pedagogy through consultation with educational experts. This section outlines the way in which the data, collected from the interviews with these experts, were managed, sorted, and organised for analysis and presents the findings from the interviews, as these pointed to refinements in the DGPs.

As indicated in Chapter 3, data collection commenced with purposeful sampling. Fifteen participants from a range of backgrounds were selected to be involved in the semi-structured interviews. Each one of these participants brought a unique perspective to the investigation and provided expertise from their personal experience and knowledge. Their attributes are outlined in the Table 2 (Chapter 3), and the experience they bring to the research is summarised in Table 3 (in the Supplementary Material section).

The recruiting of participants took place over a three-month period. This was due to the difficulties I encountered identifying and contacting possible participants, particularly in the tertiary system, along with finding appropriate times in which to conduct the in-depth interviews. This was because of my school responsibilities. On Monday to Friday, I taught from 8:50am to 2:50pm and met regularly with staff and parents between 2:50pm to 5:00pm, so there was little time to complete the interviews. Most interviewees were only available during these times. As a result, interviews were timetabled into lunch times, release times, or

after school times. On commencement of the interview, the participants were reminded that their responses were confidential, and at the conclusion of the interview were thanked for their contribution and invited to be a member of the focus group and to provide input into the refinement of the SPP.

Data collection and management

Data collection involved audio-recording educational practitioners' and Indigenous Elders' interviews, whether face-to-face or over the phone; each interview was approximately 25 minutes in duration. These digital audio files were then transcribed verbatim, and the small talk and any other discussion irrelevant to the SPP design was later edited from the transcripts. To ensure that each interviewee's intended meaning was maintained and the transcription was accurate, it was shared with the interviewee as a form of member checking (Creswell, 2007; Harper & Cole, 2012). All the interviewees verified that their transcription was accurate.

Content analysis

Content analysis (Krippendorff, 2004) was used to explore the information in the transcriptions. Categories were established and information was organised for analysis (Downe-Wambolt, 1992). This process involved reading through the transcribed data to find sections of text that were similar and recording this in the margin of the transcription. Through the analysis of the content, trends or themes within the transcriptions emerged as the occurrences of the theme intensified. These themes were organised into a table under the appropriate heading. The number of times each theme was identified was counted. The themes were ranked from those occurring most often to those occurring rarely. During this process, information was continually checked against other pieces of data to define the critical attributes of the categories and determine similarities in the data. The aim was to find

the commonalities in the transcriptions and thereby further refine the DGPs. These commonalities, or themes, are discussed further below.

Relationship between consonant articulation and learning. Of the 15 interview participants, 14 pointed to a relationship between consonant articulation and learning. They collectively highlighted the importance of recognising that children are influenced by the way they hear sounds, and agreed that the way they say sounds influences their learning. Similar to the agreement expressed in the literature (Frost, 2001; Nation & Snowling, 2004), interview participants argued that oral language and phonological skills underpin literacy development.

Consonantal differences between Indigenous languages and SAE and the implications these differences have for teaching and learning. Eight of the 15 interview participants contended that consonantal differences between Indigenous languages and SAE have implications for teaching and learning. Three interviewees highlighted the importance of explicitly teaching sounds that are similar in both languages, while five interviewees used their knowledge and experience to identify specific sounds. In other words, just over half the participants (53%) identified consonantal differences between SAE and Indigenous languages as having implications for teaching and learning. Interview participants came from a diverse range of backgrounds and had differing experiences teaching children the pronunciation of sounds or assisting in children's acquisition of speech sounds. This teaching experience ranged from participants who had taught a class of Indigenous students to those who had one or two Indigenous students in their class. Some participants had assisted children learning sounds, and a minority of participants had not been involved in supporting Indigenous children in learning SAE. However, regardless of their backgrounds, all interviewees were asked if they were aware of any phonological differences between Australian Indigenous languages (AAE) and SAE. Three interviewees (20%) identified the need to teach sounds that

are similar, such as /g/, /h/ and /θ/. Three participants recognised the need for diagnostic assessment and the necessity to teach according to the student's needs. Three interviewees refrained to comment, one participant argued for the progression of learning pronunciation for all students regardless of their cultural background, and the remaining five participants made consonant selections based on their knowledge and experience. Three participants identified /θ/ as having a difference in pronunciation. Two interviewees recognised both /t/ and /h/ as being articulated differently, and /h/ as being often dropped off the end of words. Two participants considered /g/, /k/, /z/, /r/, and /b/ to be dissimilar. Likewise, /n/, /f/, /d/, /l/, /ð/, /dʒ/, /ʒ/, /ŋ/, and /s/ were identified once each by different participants as being pronounced differently. Only two interviewees were familiar with the majority of the SAE/AAE differences (Table 4 provides further details of the responses).

Most of the participants who identified consonants as important or as the key aspect of language did not explain why they felt particular consonants were necessary. This identification of consonants reinforced DGP 7 and emphasised the need for the program to focus on consonants. One participant suggested that the SAE sounds that are different to Indigenous languages should be the focus; another indicated that the sounds that for which the tongue must be lifted to pronounce should be the focus, as they are often not in AAE. The participants' responses have been identified and placed into Table 4 to support consonant identification.

Table 4*Consonant Identification*

Consonant identified	Number of times identified by participants
θ	3
t	2
g	2
k	2
b	2
r	2
h	2
z	2
d	1
n	1
s	1
ð	1
ʃ	1
ʤ	1
ʃ	1
l	1
ʒ	1
ŋ	1
x	1
w	1
AAE and SAE feature differences based on the literature	1

The consonants identified by the interviewees and the literature formed a solid platform for the selection of consonants that differ between AAE and SAE and are pronounced in a similar way, such as /f/ and /v/, both of which are fricatives. The need for the diagnostic assessment of individual consonant articulation, including the place of articulation within a word, provided further direction and relevance for teaching and assisted in confirming DGPs 5, 6, and 7.

Interviewees were asked how the dialectal differences might have implications for teaching and how these differences might be addressed. Interestingly, six participants refrained from giving any implications and five were unable to suggest approaches to address the implications. Remembering that the interviewees were selected for their expertise in this area and that three participants refrained from providing any differences between AAE and SAE, it became evident that there was little knowledge amongst the interviewees of the implications dialectal differences have for teachers and teaching. Three of the interviewees acknowledged and expressed their concern over their limited knowledge and suggested that if they knew more about the differences, they would be better equipped to support their students. This also highlights the need for a better understanding amongst educators of the differences between SAE and AAE dialects.

Four interviewees recommended that adjustments be made for dialectal differences, including the provision of as much additional support for Aboriginal students learning SAE as possible. They also suggested teachers gain as much knowledge as possible about the student's Indigenous language, through parental contact or other means (DGP 9). Two other participants suggested teaching SAE sounds clearly, including the modelling of sound articulation (DGPs 5 and 6), teaching it often and with a focus on the areas of need (DGP 8). Three interviewees contributed to the final recommendation, regarding dialectal differences and their implications for teaching. They pointed to the importance of discussing the concept

of both languages (SAE and AAE) being of equal importance; AAE as the language used at home and within the Indigenous community and SAE to be used at school (DGP 2).

Interviewee participants agreed that differences between SAE and Indigenous languages have implications for teaching (DGP 7), should be explicitly taught (DGP 5 and 6) on a needs basis (DGP 8), and be discussed at a metalanguage level (DGP 2), and that Indigenous languages should be valued (DGP 9) in the school environment.

Consonant teaching and learning pedagogy. Interviewees were asked six open-ended questions to explore what educational practitioners considered to be the most effective or productive techniques to use when teaching sounds to young children. From these questions three pedagogical practices became evident: teaching mouth positioning (using a mirror); modelling mouth movements and articulation; and a haptic approach linking movement, touch, and sound. The most often mentioned of these (by 11 of the 14 educational experts) was the conviction that teaching the oral positioning of the mouth and vocal movements helped children learn consonant sounds. One interviewee explained that children learn how you teach the sound, not necessarily how you hold your mouth. For example, saying “/m/ rub your tummy and doing the action” helps a child pronounce /m/. This highlighted the importance of making the modelling of sounds interesting and the need to link them to movement (Acton et al., 2013; Teaman & Acton, 2013). Seven participants pointed to the value of learning letter/sound correspondence (Alphabetic Principle), along with the identification and use of sounds in words (placing sounds in context). All interviewees suggested that sounds needed to be addressed in context, taught individually, and placed back into context at both a word and a sentence level. This reinforced the inclusion of DGP 10. Taking the sound out of context, learning it, and placing it back into context represents working from wholes to parts and then from parts to wholes, which signifies “Deconstruct/Reconstruct” in Yunkaporta’s (2009, p. 21) Eight Ways of Learning.

Sensory fun activities such as games, rhymes, and songs, which focus on sounds, were also considered to be of importance, with the majority of teachers supporting this technique. This supported DGP 3; that is, that language play is the preferred approach to language acquisition through games, rhymes, and songs (fun sensory activities). One participant raised the importance of combining movement and touch, or a haptic approach (Acton et al., 2013; Teaman & Acton, 2013), to the modelling process. Acton and Teaman (2013, p. 403) define haptic as “touch plus movement” and the haptic approach as “movement and gesture used systematically in classroom teaching”. The essential element of this teaching is the haptic-integrated English pronunciation (EHIEP) framework developed by Acton (2012), which involves a set of approximately 12 procedures to learn pronunciation (Acton et al., 2013). Parts of this system have been further supported by recent empirical research (e.g. Mister-Colmenares et al., 2020). Burri et al. (2016) demonstrate the link between gesture and articulation through anchoring vocabulary with enjoyable haptic pronunciation teaching techniques. Research suggests that the practice of using gestures has a positive impact on teaching and learning second languages (Dahl & Ludvigsen, 2014; McCafferty, 2006). Morett (2014) found that using gestures while speaking enriched the learning of foreign words, while Miller and Jones (2016) further reinforce the concept by using gesture to assist in the teaching and learning of pronunciation and grammar. Interestingly, there seems to be a connection between emotion and language learning, which suggests that gesture linked with heightened emotion (such as fun) may boost retention and language learning (Macedonia & Klimesch, 2014). One of my supervisors for this doctoral research, Dr Amanda Baker, who is working in this field, trained me in the use of the haptic-gestural techniques that were used for consonants, and an additional DGP was included from her haptic work with other colleagues (Acton, 2015; Acton et al., 2013).

DGP 13: A haptic approach to modelling sounds is an appropriate approach to ensure that learning is fun and to enhance retention in both short-term and long-term memory.

Indigenous pedagogy and engagement with learning consonant sounds. Interview participants discussed a range of pedagogies, with three participants outlining more than one method that they felt was both culturally appropriate and effective. Seven interviewees described hands-on practical activities that involved visual stimuli, explicit teaching, oral-awareness and production activities, and a variety of activities to avoid boredom. Four of the seven interviewees specifically argued for oral-awareness and production activities that focused on practical engagement as the most effective and engaging method of teaching. This, coupled with DGP 12 and awareness techniques triggering memory retention, encourage engaging, effective learning. Half of the academic interviewees acknowledged that a memory trigger, something that was physical or sensory, such as a rhyme, would be the most effective method to teach consonant sounds.

When asked about Indigenous pedagogy, four interviewees described practices consistent with Yunkaporta's (2009) "Eight Ways of Learning" – modelling and scaffolding of learning (DGP 4), working from whole to parts, and watching or demonstrating before doing – as the most effective and culturally appropriate method of teaching consonant sounds to young children when coupled with activities that involved the senses (visual, auditory and tactile). These results resonated with DGP 10 and reinforced the use of haptic techniques in the teaching of pronunciation with young children. The majority of participants agreed that awareness activities that model how to make the sounds and put the sound into words using tactile experiences were the most engaging forms of pedagogy for teaching the articulation of consonant sounds; two interviewees reiterated the importance of ensuring children practice their sounds in a variety of ways, such as orally or in writing/reading. On the basis of these

comments, it was judged that DGP 10 did not adequately capture the intricacy of the “Deconstruct/Reconstruct” process from the Eight Ways of Learning. DGP 10 was thus split into two draft design principles (DGPs 10 and DGP 11).

DGP 10: Indigenous children should be taught in a manner that uses the senses to support understanding, uses narratives to enhance learning and suits their learning preferences.

DGP 11: Indigenous children should be taught using a process of modelling/demonstration, joint and/or supported activities, and individual activities where learning works from wholes to parts.

Refined draft guiding principles

The eleven DGPs that had been created from a review of the literature were revised and modified following the analysis of the data from interviews with experts. One DGP was added from this analysis and DGP 10 was split into two clear DGPs. The revised DGPs took the following form, with a slight reorganisation of numbering to bring the two additional pedagogical principles into sequence:

DGP 1: Language is learned from interaction with a more experienced person in a social context.

DGP 2: Using metalanguage while in the ZPD will enhance language learning.

DGP 3: Use of language play is a preferred approach for successful language acquisition.

DGP 4: Scaffolding of learning and communication are useful strategies to build capacity.

DGP 5: Sounds that are similar in the child’s first and second dialects should be explicitly taught together.

DGP 6: Blending and segmenting sounds, along with placing sounds in context, should be used in the process of teaching.

DGP 7: Phonological differences between AAE and SAE should be used to guide learning.

DGP 8: Assessment highlights relevant learning and assists in the development of program design that builds on students' prior knowledge.

DGP 9: Ongoing affirmation and valuing of a child's first language is crucial.

DGP 10: Indigenous children should be taught in a manner that uses the senses to support understanding, uses narratives to enhance learning, and suits their learning preferences.

DGP 11: Indigenous children should be taught using the process of modelling/demonstration, joint and/or supported activities and individual activities where learning works from wholes to parts.

DGP 12: A haptic approach to modelling sounds is an appropriate approach to ensure that learning is fun and to enhance retention in both short-term and long-term memory.

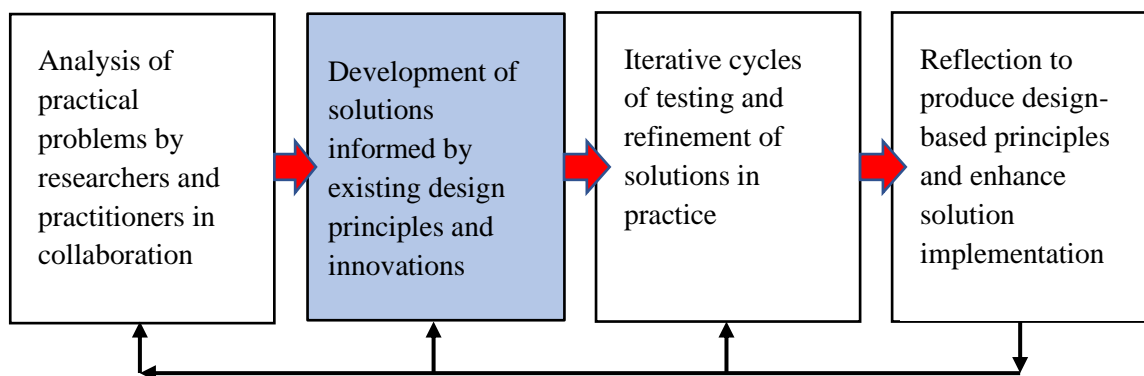
DGP 13: The involvement of expert teachers who have extensive theoretical and practical knowledge of the teaching of SAE pronunciation, who understand and value Indigenous language and cultural practices, and who provide multiple levels of support is vital.

Conclusion

Upon completion of the literature review and the analysis of the interviews with experts, 13 DGPs were established and were reflected upon as part of Phase One of the research. These DGPs, as mentioned above, are the key elements for the program and became the basis of the SPP design elaborated on in Chapter 5.

Chapter 5

Phase Two – Development of the Program (SPP)



Refinement of Problems, Solutions, Methods, and Design Principles
 Note: Based on design-based research diagram by Reeves (2006, p. 109)

Phase Two of the DBR involved the design of the sociocultural phonological program (SPP) through the guidance of the draft guiding principles (DGPs) developed in Phase One. As Reeves's (2006) diagram shows, Phase Two develops solutions informed by principles to address an identified problem. The chapter describes the development of the program from which individualised programs could be created. The individualised programs were adapted from the program in terms of content, sequencing, duration, and resources in response to the needs of each child as indicated by consonant inventory derived from the outcome of their DEAP assessment and their progress during the program.

Chapter 5 is organised into the following themes, prompted by the DGPs, that were then addressed in the program's design: a) content to be taught (DGPs 5, 7, and 8); b) how the consonants will be taught (DGPs 1, 3, 6, 10, 11, and 12); c) how the program, and lessons within, will be sequenced (DGPs 2, 4, 8 9, and 12); d) the physical layout; and, e) how the program shows the children that their Indigenous language is valued (DGPs 2 and 9). The final SPP is available in Appendix F.

Content to be taught (DGPs 5, 7, and 8)

The majority of educational practitioners and Indigenous Elders interviewed for Phase One suggested that consonantal differences between Indigenous languages and SAE have implications for teaching and learning. Three interviewees highlighted the importance of explicitly teaching sounds that are similar in both languages (DGP 5); for example, /t/ and /d/. This, together with the review of the literature (Butcher, 2008; Eades, 1993, 2013; Eagleson, 1982; Kaldor & Malcolm, 1979, 1982, 1991; Sharpe, 1977; Toohill et al., 2012; Williams, 2000) and my previous local research assisted in the establishment of the consonants selected for teaching.

As indicated by DGP 7, the expected focus of the program would be to work with the obstruent group of sounds, particularly fricatives (DGP 7). While the content needed to cater for individual students' learning needs, each child's inventory often contained similar obstruents; for example, /b/ and /p/. These sounds need to be explicitly taught together so that children learn the physical differences in articulation (Aoyama et al., 2004; Flege et al., 1997). They were placed in the program one after the other. For example, in the SPP, /θ/ and /f/ are taught together one after the other and /ð/ and /v/ are taught together one after the other. These sounds are also reviewed together to resolve any difficulties children may be experiencing in pronunciation. Within the first version of the SPP these sounds were taught in the following sequence: /θ/, /f/, /ð/, and /v/. Table 5 outlines consonants that according to the literature are similar (Butcher, 2008; Eades, 2013; Eagleson, 1982; Kaldor & Malcolm, 1982, 1991; Toohill et al., 2012; Williams, 2000), and I argue that they should be placed in a teaching sequence together based on DGP 5 and the literature (Baker et al., 2008; Flege et al., 1997). Individual student needs should guide the program content through the use of the DEAP (Dodd, Hua, Crosbie, Holm, & Ozanne, 2002) assessment (DGP 8)

Table 5*Consonants to be taught together*

<u>Consonant category</u>	<u>Consonant groupings to be taught</u>
Fricatives	/θ/, /f/, /v/, /ð/
Fricatives	/s/, /z/
Fricatives	/ʃ/, /ʒ/
Affricates	/tʃ/, /dʒ/
Stops	/p/, /b/, /t/, /d/
Stop/fricative	/k/, /g/
Nasals	/m/, /n/, /ŋ/

The intention at this point was that each child's DEAP inventory would assist in deciding which, and how many, consonants would be taught in the personalised SPPs.

How the consonants will be taught (DGPs 1, 3, 6, 10, 11, and 12)

A range of pedagogies were embedded into the SPP based on the DGPs: Sociocultural theory (DGP 1, 2 & 4); language learning pedagogy (DGPs 3 and 6); Indigenous pedagogy (DGP 10); and haptic pedagogy (DGP 12).

Sociocultural theory (Vygotsky, 1962, 1978) emphasises that language learning takes place with a more experienced mentor/adult, in this case, the teacher, in a social environment. It is in this social environment that language is discussed (communicated) and ideas accepted (DGP1). As children engage in lessons where they are assisted by their teacher, they learn how to collaborate and use cooperative dialogue (Kozulin, 1990; Swain & Lapkin, 2000, 2002) and this process is described as the Zone of Proximal Development (ZPD). Lantolf (2000) describes the ZPD as the difference between what a person can achieve alone and what the same person can accomplish when acting with the support of someone else and/or

cultural artefacts. Children are supported through the lessons by the teacher who aides their achievement (DGP 1). Children learn about SAE and their first language through dialogue with the teacher (DGP 2). This dialogue involves talking about talk or metalanguage.

Lessons were scaffolded (DGP 4) into a lesson sequence that provided a progression of learning from the direct learning of the pronunciation of a sound, through guided techniques and independent pronunciation and comparison of sounds, and finally to language play (DGP 3). This lesson scaffold provided optimum support and the opportunity for similar target sounds to be taught together, in a sequence, played with and discussed. Lessons were individualised to provide deep understandings and personal needs.

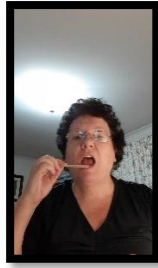
Indigenous children require an understanding of the whole learning journey before they begin learning (Yunkaporta, 2009). This is catered for at the beginning of each lesson when the teacher talks about the language differences and learning goal for the lesson (DGP 2). In the SPP, this is made explicit in the column titled “Awareness and teaching pronunciation (Haptic)”, which states, “Tell the children what you are doing today and why you are teaching it.” This shows children that the knowledge of how to pronounce the phoneme has come from the whole picture of helping them learn SAE for use at school. This process of building from the whole picture is guided by the implementation of DGP 11 and supports engagement with the lesson. It addresses the concept of providing support to each child as a bilingual student and upholds the belief that their home language is valued (DGP 9). In the program, building from the whole picture is where the teacher talks to the student about the focus sound, discusses how it is pronounced in the child’s dialect, and explains the lesson progression (DGP 11). This provides the student with the whole lesson sequence or the whole picture (DGP 10). This discussion ensures that children are talking about language as an object and discussing the differences (DGP 2), which encourages learning (Couper, 2011; Daffern, 2016; Gebhard et al., 2014; Heron et al., 2021; Su Chai Siik & Hawkins, 2013). It is

followed by the process of modelled, guided, and independent learning to encourage the Indigenous children's participation through the provision of learning experiences that are based on Indigenous ways of learning (DGP 11).

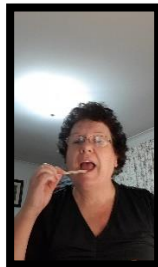
The first section of the lesson, "Awareness and teaching pronunciation", was designed around haptic techniques to model the sound being introduced (DGP 12). The intention was for the children to be encouraged to produce the sound through sensory activities, and eventually to produce and practise the sound without support. If the children required reminders, the sequence would be repeated. This activity boosts learning through the engagement of senses (DGP 12), the provision of an enjoyable way to learn, and enhanced retention in both long- and short-term memory (DGP 10).

To assist the teachers in incorporating haptic techniques in their teaching, I sought the assistance of Dr Amanda Baker, one of my PhD supervisors and Senior Lecturer at the University of Wollongong, who has 15 years of knowledge and experience in using haptic techniques. She taught me the teaching procedures and gestures/movements necessary to teach each of the phonemes. These constitute the directions/instructions in the first column, "Awareness teaching pronunciation (Haptic)", of the SPP (Appendix F). Dr Baker discussed the typical procedures and teaching progressions involved in teaching the segmentals. She also explained how the haptic teaching sequence could be adjusted if necessary when taught in the classroom, as it would be for this research project. For example, the /f/ phoneme is taught using the following process:

1. Using a craft stick, the teacher demonstrates to the student(s) how to first brush the dry part of the bottom lip and then the wet part of the bottom lip.



2. The student mimics this and the teacher assists where necessary.
3. The teacher emphasises the line where the wet area and dry areas of the lip meet and, together teacher and student complete this action three times with the craft stick.



4. The teacher demonstrates how to touch the top teeth to the line between the wet and dry areas of the bottom lip and blows out three times.



5. Together the teacher and student touch their teeth to the line between the wet and dry areas and blow out three times.
6. The teacher demonstrates how to place the hand horizontally in front of the mouth, with teeth touching to the line, and blow out three times.



7. The teacher and student together place one of their hands horizontally in front of their mouth, with teeth touching to the line, and blow out three times.
8. The teacher demonstrates how to place the hand horizontally in front of the mouth and say words (with the sound in initial position) in different positions in front of them. Each word involves starting with the hand horizontally in front of the mouth and moving it to the other hand, using a clapping-like motion (without the clapping sound). Each word is pronounced in this way three times. Each word is pronounced in different positions in front of the student. For example, upper left “fee”, lower left “fight”, upper right “for” and lower right “fun”.⁴



9. Together the teacher and the student place the hand horizontally in front of the mouth and say words (with the sound in initial position) following the different

⁴ The original version taught by Dr Baker was modified to reduce the quantity of professional learning required and to enable ease of teaching.

positions in front of them. Each word involves starting with the hand horizontally in front of the mouth and moving it to the other hand, using a clapping-like motion (without the clapping sound), three times for each word. The teacher helps the student where necessary.

10. This whole teaching sequence (steps 1-9) is repeated with the student following the teacher's directions. Some additional demonstration may be provided if necessary.

Learning through haptic techniques is directed at and involves modelling the learning process for the child through sensory activities. It encourages them to join in and work directly with the teacher's guidance (DGP 1). The aim of this exercise is to enable the child to remember the process and the pronunciation of the sound through the sensory movements and touch, essentially learning to feel the appropriate articulation of the sound (e.g., placement of the top teeth on the dry/wet line of the bottom lip). These procedures also follow the practise of modelled, guided and independent teaching and learning, a quality teaching process (NSW Department of Education and Training, 2006) that is encouraged in the teaching of phonology (NSW Department of Education and Training, 2009). It is expounded in DGP 11.

After the children had been involved in modelled and guided practices to learn the pronunciation of the sounds, as indicated in DGP 3 and based on the sociocultural learning theory underpinning the program, language play (DGP 3) was incorporated into the program through fun-based activities to drill and practise sounds. During the second part of the lesson, in which phonemes are placed into context, engaging, play-based language (DGP 3) sensory activities were included not only to cater for individual needs but to trigger students' memory (as per the second column of the SPP, "Phoneme into context (word) with activity"; Appendix F contains more detail). In keeping with DGP 6, activities were included that would facilitate the children's attempts to vocalise the sounds within words. The program

was designed to assist children in their creation of words by blending the sounds together and joining segments of words together to identify words (DGP 6).

The next activity in each lesson was to encourage the children to read words containing the same sound in words on picture cards or in Indigenous readers. For example, the book *In the Bush* (Anderson, 2003) was used for the sound /θ/. The aim was for children to be able to blend and segment sounds to articulate the words both accurately and meaningfully (DGP 6). The program design provided a platform for the placement of sounds in context, in both words and sentences. Reading words in sentences was alternated within the program with writing words in sentences. For example, SPP Lesson 1 (Appendix F) involved placing the sound into a word and into a sentence through a writing activity, while Lesson 2 involved the use of an Indigenous reader. The intention was for the children to write their sentences into a book with an illustration to assist with retention.

The integration of Indigenous pedagogies (DGP 9, 10 & 11) takes place throughout the program. DGP 9 is an attitude held by teachers teaching the program and is particularly evident in the early section of the program where the child and teacher discuss language differences and articulations. This discussion ensures the child understands that their first language is valued and sets the tone for the lesson. Opportunities are encouraged to build dual language confidence and link Indigenous languages to the learning of SAE sounds (Scull, 2016). The complexities of the languages and their differences are acknowledged during the lessons and multiple levels of support are provided as the teacher is working one on one with the student (Scull, 2016). DGP 10 is most apparent towards the end of the lesson where children are engaged in Indigenous stories or narratives and games/activities of their choice (Yunkaporta, 2009). While DGP 11 is a scaffold built into the program sequence, children are encouraged to talk about words/sentences that contain a particular sound, and in this way, the sound becomes the focus of the lesson. The target sound is extracted from the words and

taught using haptic techniques. The process involves teacher modelling, guided joint activities and the learning of individual sounds (words are deconstructed into a sound). After the core articulation haptic technique section of the lesson is complete the sound is placed back into words, using language play, and then into sentences which are written or read in Indigenous readers (reconstruct). Lessons progress through a process of learning language in whole pieces or sentences to parts or sounds, and back again (DGP 11) (Yunkaporta, 2009).

When students were required to articulate multiple sounds, Indigenous texts that contained a variety of focus sounds were used. For example, the book *What We Count, Then and Now* (Empacher et al., 2003) was used for a focus on /p, f, b, d/. Indigenous readers were specifically selected for inclusion in the program as they provide Indigenous children with learning based on their own culture, and their inclusion allows for Indigenous learning preferences. As indicated by Yunkaporta (2009), the reading of narratives (images etc.) enhances children's engagement and builds rapport with the teacher through the connection made during the reading activity (DGP 10). Indigenous readers were also selected based on their phonetic content and their ability to provide an opportunity to revise the sounds previously learned in the program.

Allowance was also made for children's more-personal learning preferences by providing opportunities for the child to select the text or game (DGP 10). The actual texts and activities were not written into the program design, as the list for teachers to choose from would make the program extremely lengthy. The teachers understood that they could vary the text or game but were asked to ensure the selection revised the focus phonemes and that the student was engaged with the activity. Sensory activities (DGP 10), such as writing sounds and words in kinetic sand, were placed in the program to provide children with an opportunity to heighten their memory of the learning experience (Burri et al., 2016; Morett, 2014). This was followed by rhyming games, reading, and nonsense-word identification,

sound match-up, and pronunciation games, which were included to help children remember and revise sounds. This part of the program usually occurred at the end of lessons. For example, “Trash or treasure” in Appendix F (the fourth column of the SPP, “Mixed phoneme/word revision game”).

For both iterations, I ensured that a teacher with a literacy background who was experienced working with primary aged children taught the SPP (DGP 1). I worked with each teacher to make sure that these alterations took place for each student. For example, one child enjoyed playdough, so I supported the teacher in allowing her to use playdough regularly, but with encouragement to try different textures and activities as well.

The physical layout

The physical layout of the SPP was formatted so that each lesson could be read and/or taught in a sequence that moved across the page (left to right), from one column to another, following the numbered columns (Table 6), with the first column indicating the awareness teaching of pronunciation, the second column placing the target phoneme into the context of a word, the third column placing the word containing the phoneme into a sentence, and the fourth involving playing games that contain the phoneme both singularly and in words, with the aim of revising target phonemes. This format made the lesson sequence easy to follow and provided the means to include detailed notes on teaching pedagogy and content. This was due to the natural pauses in teaching between activities that allowed the teacher to write notes while the child found the resources necessary for the next activity.

Table 6*Sociocultural phonological program lesson sequence for /f/*

<u>Lesson sequence headings and purpose of each section</u> (Teach the sequence from 1, left column to 4 right column)			
1.	2.	3.	4.
Awareness and teaching pronunciation (Haptic)	Phoneme into context (word) with activity	Sentence creation using word containing phoneme	Mixed phoneme/word revision game
<u>Instructions to teach each section of the lesson</u>			
1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. 2. The haptic procedure for /f/ in Appendix F.	1. Child makes a new /f/ word using playdough and sounds it out when complete. They articulate the word correctly in a sentence of their own.	<u>Sample sentence:</u> Fat fish eat little fingers.	Play a Rhyming Game e.g. How fast can you say – Fred fishes with five freckled friends on Friday?

The sequence of the program, and lessons (DGPs 2, 4, 8, 9, and 12)

According to the literature, ideally each lesson would be approximately 20-25 minutes long (Clark et al., 2012) and take place regularly, approximately three days a week (Gathercole & Alloway, 2008; Rohrer & Pashler, 2007). However, in practice, in this study, this time allocation depended on the teacher's responsibilities and the time allocated to the program by the principal. The duration and frequency of lessons will always differ depending on the school context and the nature of the learners. The two iterations in this study were both carried out using different timetabling restrictions; however, they achieved similar outcomes.

The program duration depends on the number of consonants to be addressed. As indicated above, to ascertain this, the individual student's learning needs were assessed through the DEAP assessment (DGP 8). If the student were simply substituting /d/ with /θ/, the program would address both sounds to draw the child's attention to how the phonemes substituted for target phonemes. The phonemic awareness strategy of substitution was identified by both the expert educators and the literature as an important skill (NSW

Department of Education and Training, 2009; Poliakoff & Rogers, 2001). There is general agreement that children's awareness of both the target phoneme and the substituted phoneme should be explicitly taught, and differences recognised, as this links previous knowledge to the learning activity at hand (NSW Department of Education and Training, 2009). It helps children to realise how they are articulating both the target and substituted phonemes.

The program was designed to consist of three lessons for each sound: one lesson to learn the pronunciation, a second to consolidate the pronunciation, and a third to revise the child's articulation. An additional lesson per individual sound sequence was added after the second sound was taught; this was to consolidate the pronunciation of sounds together in a game-based lesson. For the sounds /θ/ and /d/, a final lesson that focused on the production of the sounds together would be added to the lesson sequence. Similarly, if the student required work on improving the production of eight sounds, then 24 lessons would focus on the individual sounds and a revision lesson in which the target sounds were revised collectively would commence following the teaching of the first two sounds. Further revision lessons collectively revising the target sounds would occur after the teaching sequence for each sound. This lesson sequence scaffolds learning, builds on each sound learnt, and revises phonemes collectively (DGP 4). It encourages effective communication between teacher and student through discussion of both previous and future learning, and thereby promotes capacity-building (DGP 4). The Individualised Meta-Phonological Awareness Instruction model (I-MAI) (Philip & Nolan, 2018) as described in Chapter 4 was applied to each lesson and followed the haptic techniques teaching sequences as described by Baker (Acton, Baker, Burri, & Teaman, 2013; Baker, 2014, 2017). Collectively these scaffolds provided support for student learning within the ZPD.

As well as these scaffolds and guiding the sequences between lessons, the strategy of using modelled, guided and independent learning was sequenced within each lesson. Initially

some time was allowed for discussion about the student's L1 and SAE. This encouraged metacognition development and, as indicated above, ensured that the students understood that they are valued (DGPs 2 and 9).

Following the discussion of the students' L1 and SAE, the instructions in the SPP indicate that the learning goal should be clearly explained and the consonant to be taught modelled using haptic techniques (DGP 12). During this time the student is asked to join in and follow the procedure, thereby encouraging the student to articulate the sound accurately through modelling and guiding their articulation. Once the student demonstrates independent pronunciation, the teacher continues to work with the student to practice the sound independently. Following this, the teacher continues to provide support and guidance to help the student place the sound in context, in both words and sentences. Finally, children use the articulation independently in words, phrases, and sentences, and in enjoyable games. For instance, the sound /θ/ could be used in a variety of words using the initial, medial, and final positions (for example, three, toothbrush, tooth). The teacher uses picture cards to assist in the child and prompts where necessary. Then the teacher may ask the child to say "three teeth" and follow this by placing it in a sentence such as, "The baby has three teeth and is going to wash them with a toothbrush." The child and teacher together write a sentence using the words. Following this activity, the teacher and student could play the game "Snap" using these words once other cards are added to the collection (the SPP in Appendix F gives further details).

Showing children that their Indigenous language is valued (DGPs 2 and 9)

At the commencement of each lesson in the SPP, time was allocated to remind children that their Indigenous language is valued (the fourth column, "Awareness and teaching pronunciation", as shown in Appendix F). In my training of the teachers prior to the implementation of the SPP, the teachers were encouraged to discuss the language differences

between the student's home language and SAE with the children. The aim was to use metalanguage, or talking about speaking (DGP 2). For example, a teacher may say "You say 'teef' at home because it's the way you speak at home. It is different to the way we speak at school and that's okay because it's your family's language. What other words do you say differently at home?" This affirmation that the child's Indigenous language is important, to be used at home and in their community, and is different to the language (SAE) used at school, follows DGP 9, which states that ongoing affirmation and valuing of a child's first language is crucial. As explained in Chapters One and Two, explicit recognition of the difference that context makes in language use was necessary for the SPP's success and for the valuing of the child's personal identity.

Focus-group feedback

This phase involved two focus-group meetings: the first to review the SPP framework and to address the ways in which the DGPs would be placed into program design; and the second to appraise the SPP (Appendix F) before its implementation in Iteration 1.

Prior to the first focus-group meeting I sent the SPP design framework (Appendix D) and the DGPs to all focus-group members and suggested some meeting times. The three members of the focus group who could attend agreed that the process to formulate the SPP, the design framework, was feasible. I emailed the design framework to the other three focus-group members; two responded favourably to the design framework and supported further development of the SPP. The third participant did not respond at this time but responded favourably three days later. Following this communication, I developed the SPP based on the design framework.

Once I had designed the SPP, I sent copies of the SPP (Appendix F), the SPP design framework (Appendix D), the DGPs, and the questions for discussion during the meeting to

the focus-group members the week before our second 22-minute meeting. I asked the focus group to look at the SPP design framework, the DGPs, and the SPP, and ask themselves if all the DGPs were embedded in the SPP and the plan for teaching the SPP. This provided the focus group with some time prior to the meeting to peruse the documents before further discussion.

During this meeting the focus group were asked three questions to ascertain whether the SPP was ready. The first was: Do you think the program will be effective? The majority (five of the six focus-group members) of the participants agreed that the program would be effective. The remaining participant wasn't sure that the SPP would be effective, as they felt it depended largely on the teacher involved. The second question was: Do you think there is anything you think should be altered in order to improve the effectiveness of the SPP prior to its implementation? This question prompted discussion about the knowledge and experience of the teacher delivering the program.

The whole focus group thought that the teacher would have a huge impact on program effectiveness. I agreed with the group and assured them that I would endeavour to involve a knowledgeable, experienced teacher to complete the first iteration. I explained that the selection of a teacher relied heavily on the availability of the teaching staff, the school's timetables, and the principal's allocation of staff. Lively discussion was inspired by the final question: How do you think it should be implemented? Participants suggested that the SPP implementation would require a quiet environment where ideally children were taught individually or in pairs. The focus group agreed that this would allow both the students and the teacher to observe the movements and hear the articulations during the modelling and guiding phases of learning the haptic techniques.

Following this meeting, I discussed the requirements of the program with the principal and acquired both a quiet room in which to teach the SPP and an experienced, knowledgeable teacher who was both willing and eager to deliver the SPP. This teacher was sensitive to Indigenous culture and languages and trained in recent language-teaching initiatives, and had worked as a primary teacher for over 10 years. She was allotted two hours a day, four days a week, to teach the SPP, eight hours a week in total for nine weeks, a grand total of 72 hours each term, which included any teacher training that was required.

Preparing for implementation: Practical considerations

Implementation of the SPP by a teacher with extensive theoretical and practical knowledge depends on the resource allocation of the school. A teacher possessing these qualities may not be available to teach the program. In this case it is vital that the teacher be trained in the pedagogy of the SPP and understand the importance of valuing the child's first language (Scull, 2016). For my research, I found that the school principal was agreeable to allowing an experienced teacher to deliver the SPP in Iteration 1. This was partly because the teacher volunteered to teach the program and her forethought in reorganising her timetable to allow time for the SPP made the decision easier. The request for a teacher to deliver Iteration 2, however, was more difficult. The time allocation and teacher availability were restricted, and despite the positive results from Iteration 1, the duration of the SPP's implementation was limited. The teacher who taught Iteration 1 was not available. The teacher who was allocated the role by the principal for Iteration 2 was only teaching two days a week and was only allocated to teach the program for seven hours a week, one hour fewer per week than in Iteration 1. Although this was not a change I had envisaged, it generated circumstances that in the long term could further improve the ability of the study to address the problem (Herrington et al., 2007). The literature supports this concept by emphasising that a strength of DBR research is its capacity to address multiple variables in real-world environments

(Barab, 2006; Collins, 1992; Wang & Hannafin, 2005). What would be important would be the outcomes: how would the changes affect the children's learning?

The teachers' knowledge and experience differed in each iteration. Both teachers required training in the haptic techniques and the required pedagogy. The teacher of Iteration 1 had previously worked closely with the Indigenous community and was fully aware of the importance of valuing the child's Indigenous language. The teacher of Iteration 2 required some training to appreciate the differences between SAE and Indigenous dialects. This training needed to take place within the timeframe provided by the school. I trained the teachers in the pedagogy, including the haptic techniques, the content, and the importance of valuing and accepting Indigenous language. This took place in the first week of the program. The teacher of Iteration 1 required less-intensive training than the teacher of Iteration 2. I was satisfied in both cases that the teachers were well prepared to teach the program.

The teachers understood that there was a theory that formed the foundation of the SPP, and they were given lessons on how to use the haptic techniques and other pedagogy within the SPP. A practical ability to demonstrate and teach the haptic techniques was vitally important to the implementation of the program. The intentions were that training would be ongoing throughout the implementation; thus, time needed to be embedded into the teaching schedule to ensure the smooth progression of the program. During both iterations a half-hour time slot was negotiated each week to go through the haptic technique to be taught during the week and discuss any student feedback or teacher concerns that might have arisen during the week. This way the teacher was supported throughout program delivery.

Ideally the program would be taught one-on-one, in a quiet space, to ensure that children practiced phoneme pronunciation accurately (Clark et al., 2012; McKellin et al., 2011; Nelson et al., 2005). Each phoneme to be taught was allocated three lessons: one to introduce the sound and teach it explicitly, one to check student retention and reinforce

pronunciation, and one to integrate the phoneme pronunciation with similar sounds.

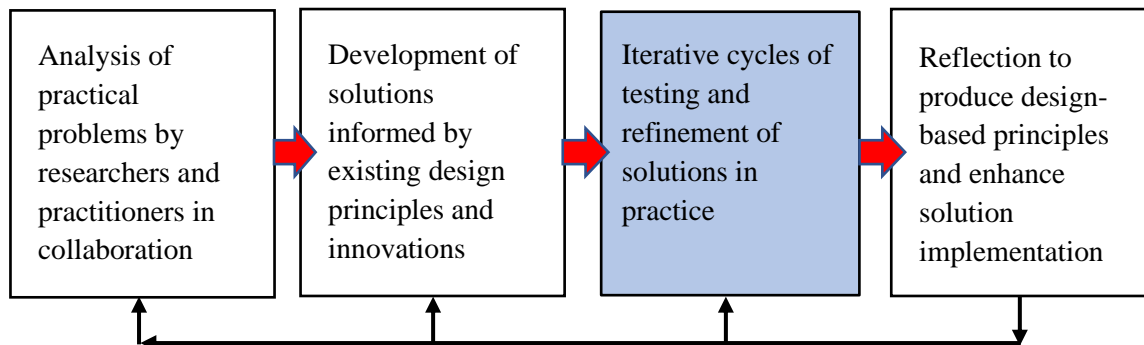
According to cognitive and educational psychology theorists who have researched “the spacing effect” (Pashler et al., 2007; Rohrer & Pashler, 2007), learning is more effective if spaced rather than massed. However, program duration is likely to be affected by the number of students completing the program and the resources, both physical and human, allocated by the school. As was the case in this study, the program needs to be adjusted to adequately accommodate the learning needs of the students and the school’s resource allocation.

Conclusion

This chapter, Phase Two of the DBR, has explained how the SPP was developed through the embedding of the DGPs. These DGPs were established in Phase 1 of the DBR in consultation with the literature and the experts. This chapter has described the development of the program from which individualised programs could be created. The SPP was developed in consultation with the focus group and provided the basis on which the individual programs, described in the next two chapters, were built and implemented in two iterations with two groups of children.

Chapter 6

Phase Three – Iteration 1: Refinement of the DGPs



Refinement of Problems, Solutions, Methods, and Design Principles
 Note: Based on design-based research diagram by Reeves (2006, p. 109)

This chapter consists of a description of Iteration 1 of the sociocultural phonological program (SPP), including the data collected and analysed from the implementation of the program to inform the refinement of the SPP and the draft guiding principles (DGPs).

To ensure that the SPP implementation was successful, information about available resources and student background information were required and DEAP assessment inventories were needed to inform the individualised programs. Teacher training was also an essential part of the pre-program preparations.

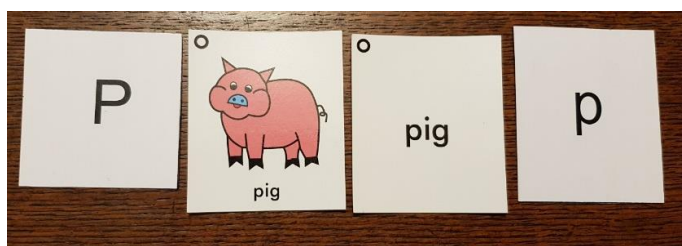
Resource allocation

The availability of resources, including the teacher, will always affect the SPP design. However, the physical resources required for the program are minimal. The main tangible resource is the DEAP assessment kit, which is necessary to assess each child's articulation prior to the program's implementation and to assess their pronunciation at its conclusion. It is the use of this tool that ascertains a child's articulation needs and progress. Other measures, such as video recordings and student work samples, provide further confirmation of their language development.

The resources required to support the teaching of the program include: sound cards with each phoneme; cards with the phoneme in a word; and a card with a picture of something that starts with the phoneme (Figure 3 shows sound cards for /p/).

Figure 3

Sound cards for /p/



Other physical resources that were used in the implementation of the SPP described in this study included: letter tiles, playdough, plasticine, whiteboards and markers, paper and pencils, Aboriginal readers, kinetic sand, magnetic letters (Lundberg et al., 1988; Peterson et al., 2016), and an iPad with an Australian letter sound articulation application installed (Segers & Verhoeven, 2005) titled “Speech Sounds For Kids” (<https://mmsp.com.au/speech-sounds-for-kids/>). Most, if not all, of these are available within the primary school setting; if not, in most cases, other resources can be improvised to replace them.

The most important resource is the teacher. As DGP 13 assumes, a teacher who understands Indigenous culture, including the importance of language, and values the importance of a student’s home language, is vital. The teacher needs to understand the link between language and identity to be responsive to the students’ complex learning needs. This teacher requires a full understanding of the SPP, including the underlying theory, and it is vital that this teacher has a working knowledge of how to implement the SPP. The outcomes

of the program depend on the teacher's knowledge of the SPP, the DGPs, and the practical application of the SPP.

I trained both teachers prior to the implementation of the SPP. This training included:

- The importance of language to Indigenous people and the need to discuss with the students how they speak at home, while at the same time reassuring them that the SPP is to assist with their learning of SAE at school, and that they do not need to change the way they talk at home.
- The need to provide the children with a learning goal so that they understand the reason for engaging in the lessons.
- The DGPs and their underlying theory. This knowledge provides the teacher with the pedagogy, the possible content, and an understanding of the SPP's lesson sequence.
- The haptic techniques for each sound to be taught.
- The practical application of the program. This involves how the SPP is set out, how to place sounds into words and sentences, and how some activities, such as games, may be modified to engage the student. I impressed upon both teachers the necessity to keep to the lesson schedule, as there was limited time in which to teach the SPP.

Iteration 1: Student background information

The five Indigenous children and their carers who were invited to participate in Iteration 1 had been identified by their class teachers as in need of assistance with their SAE speech. Prior to my request for participants, some of the teachers had been considering suggesting to carers that they take their child to a speech therapist. Prior to their involvement in the program their caregiver was asked to provide some background information about their son or daughter. Table 7 gives this background information about the child's perceived

pronunciation, dialectal/language heritage, and experiences. The children's names have been changed to maintain anonymity.

Table 7

Iteration 1: Participant attributes

Participant	Gender	Age	Heritage	Dialects/ languages spoken by ancestors	Pronounces SAE sounds accurately	Language other than English spoken at home
Amy	Female	7yr 8m	Australian Aboriginal Anglo- Saxon	Gundungurra	No	No
Brian	Female	8yr 3m	Australian Aboriginal Scottish	Wangkumara	No	No
Connor	Male	6yr 10m	Australian Aboriginal	Not aware of any	Sometimes mispronounces sounds	No
Diane	Female	8yr 0m	Australian Aboriginal Scottish	Kamilaroi	No	No
Emily	Male	8yr 0m	Australian Aboriginal Scottish Maltese	Not aware of any	Yes	No

Preparation for the Iteration 1 SPP individualised programs commenced with my administration of the phonology subtest of the DEAP assessment to each child to assess all consonantal articulations in accordance with the International Phonetic Alphabet (IPA) (Harrington et al., 1997; International Phonetic Association, 1999). If the child articulated a sound that was a substitution, I placed it in the student's inventory. For example, Amy substituted /θ/ with /f/ in the word initial position such as in the case of 'thank you', that is, /θaŋkju/ was substituted with /faŋkju/. As a result, /θ/ was placed in Amy's inventory. The

individual results for all five student participants' DEAP assessment inventories were collated into a table for analysis (Table 8 in the Supplementary Material section).

The phonemes in these inventories became the SPP content tailored for each child's learning differences through the development of individualised programs. For example, Brian's SPP content would focus on /θ, f, z, dʒ/, while Emily's content would focus on /θ, b, d, dʒ, ð, v, ʃ, f, t, p/.

Although the students were included in the study because their teachers had identified them as having difficulty articulating the sounds of SAE, all five of the students' results were within the DEAP assessment norms for children from three years to six years 11 months of age. However, four of the five students were above the age range for the DEAP assessment, and while the DEAP guidelines indicate that raw scores should not be interpreted as standard scores or percentiles for children above the age limit (Dodd et al., 2002), I felt it was important to equate the participants' results to children slightly younger (six years 11 months) because children who are learning SAE as an L2 or dialect often learn SAE sounds at a slower rate (Flege et al., 2003). The rate of acquisition becomes the important influence, and age is no longer an appropriate way to calculate the student's age of phoneme acquisition. A study by Toohill et al. (2012), where Indigenous children were identified by their teachers and caregivers as having difficulty talking and making the speech sounds of SAE, found that the intensity of the classification was reduced when AAE pronunciation was included. In the current study, the aim was to support children's acquisition of SAE. Raw scores were obtained for the percentage of phonemes correct (PPC); these were converted into standard scores using the tables within the DEAP assessment. This allowed a comparison between a child's performance and the standard measures to 1% of the mean, remembering that four of the five children were above the age limit of six years 11 months (Amy, Brian, Diane, and Emily). Approximately two-thirds of all children who have taken this assessment have

standard scores between seven and 13 (within one standard deviation of the mean). All five students' standard scores fell within this range. Confidence scores⁵ of 1.1 at a 95% confidence level for all five children indicated that these scores were appropriate for children six years 11 months old (Table 9 gives the raw scores).

Table 9

Iteration 1: DEAP assessment raw scores

<u>Child's designation</u>	<u>Raw Score</u>
Amy	276 out of 284
Brian	282 out of 284
Connor	276 out of 284
Diane	281 out of 284
Eli	274 out of 284

The DEAP assessment inventories (see Table 8 in the Supplementary Material section) formed the content for each student's SPP. Further description of the individual student's SPP design is detailed in the following section.

Sociocultural phonological program (SPP) refinement of content (DGPs 5 and 7)

All five DEAP assessment inventories in Table 10 (in the Supplementary Material section) were combined, analysed, and compared to the AAE phonological features found in the literature. This analysis was cross-referenced with the consonants identified as an important program focus by the 15 educators and Indigenous Elders in their initial interviews (The results of this analysis is provided in Table 10 in the Supplementary Material section of this thesis).

⁵ Confidence intervals were based on the psychometric standard error of measurement (SEM). The scores obtained allowed for the measurement of error inherent in all tests. The confidence intervals reflect the likelihood (95% level of confidence) that a child's true score will fall within this range (Dodd et al.,2003).

The most challenging consonant sound highlighted by all sources (literature review, interviews and DEAP assessment) was /θ/. All five children substituted /θ/ with /f/ in all three positions (initial, medial, and final) in the DEAP assessment. As a result, /θ/ was placed in the SPP content for Iteration 1. The consonant sound /ð/ was also highly rated by all sources as necessary for the SPP. In the DEAP assessment, it was substituted frequently by /f/, sometimes by /v/, and occasionally by /d/ and /t/. All of the substitutions occurred in the medial position, except on one occasion, where a /t/ substitution occurred in the initial position. On the basis of these results, the consonant /ð/ was placed in the SPP. There were also a moderately high number of substitutions of /dʒ/. All of the substitutions of /dʒ/ in the DEAP assessment were in the final position except for one occasion where Amy substituted /dʒ/ with /d/ in the initial position in the word “giraffe” by saying /dʒ:ɪf/ instead of /dʒɜ:ɪf/. These substitutions included /f/, /z/, and /g/. Due to the challenging nature of /dʒ/ and its frequency of substitution, I placed it in the SPP content. All three of the phonemes, /θ/, /ð/ and /dʒ/, were also identified as used differently or not used in most Indigenous languages and so were included in the SPP content (Butcher, 2008; Eades, 1993; Eagleson, 1982; Kaldor & Malcolm, 1982, 1991). The phonemes /f/, /v/, /d/, and /t/ were added to the SPP content, as they were used as substitutions and have no equivalent in AAE languages (Butcher, 2008).

Finally, Emily and Brian used the fricatives /z/ and /ʃ/ as substitutions for the affricative /dʒ/; the alternation of affricates and fricatives is a common feature easily confused (Butcher, 2008; Kaldor & Malcolm, 1982, 1991). Two other children used the voiced plosives /d/ and /g/ as substitutions for the /dʒ/, which are not phonological features of AAE. Each one of these substitutions occurred once and each one was articulated by a different student. For this reason, and due to time constraints, /g/, /z/, and /ʃ/ were not placed in the SPP. Also, one student alternated the bilabial voiced and unvoiced stops /b/ and /p/, which

have no equivalent in AAE (Butcher, 2008); for this reason /b/ and /p/ were included in the SPP content.

The substitutions that were placed in the SPP were all phonological features that have no equivalent in AAE or are pronounced differently, were frequently evident in the DEAP assessment, and were consequently linked directly to the target phonemes chosen for the program. The phoneme /f/ was included in the SPP, not only because it was used frequently as a substitution, but as it rarely occurs in AAE and is frequently used in fricative simplification (Kaldor & Malcolm, 1991). The fricative /v/ was included as it is also used in fricative simplification, alternating with /ð/ (Kaldor & Malcolm, 1991), and was highlighted by the DEAP assessment. The plosives /t/, /p/, /b/, and /d/ were also included, as they too are often used as substitutes for phonemes (Eades, 1993) and are alternated by Indigenous children learning AAE (Butcher, 2008; Kaldor & Malcolm, 1991).

Therefore, the initial content for the first iteration of the SPP focused on the target sounds /θ, ð, dʒ/ and the substitution sounds /f, v, t, d, b, p/. The following content was embedded in each child's SPP: Amy /θ, ð, dʒ, f, t, d/; Brian /θ, dʒ, f/; Connor /θ, ð, dʒ, f, v/; Diane /θ, ð, f, d/; and Emily /θ, ð, f, t, d, v, b, p/. These sounds, depending on individual student needs, were programmed into the SPP using the consonant groupings in Table 5 (in Chapter 5) to sequence the lessons. Accurate pronunciation of these sounds enhances children's intelligibility and comprehensibility (Eades, 1993).

The teacher, the SPP, and DGP 13

Due to my other teaching commitments within the school, I was unable to teach the program, so the principal allocated Mrs T to the program for Iteration 1. As indicated in Chapter 3, Mrs T was an experienced teacher who had not only worked as a class teacher but had previous experience working with children on individualised programs. Each student

participating in the SPP was allocated one lesson a day, four days a week for 10 weeks. This duration included the final DEAP assessment.

Mrs T and I had an intensive meeting to commence the SPP. During this meeting we discussed the students' individualised programs, the outcome of each child's DEAP assessment, and the haptic techniques. Before the meeting ended we looked for suitable resources. During this meeting I taught Mrs T the haptic techniques for /θ/ and /f/, the first two haptic techniques to be taught in all five individualised SPPs. I also provided Mrs T with a video of the techniques for /θ/ and /f/ so she could practise them before our next meeting. Following this initial meeting, we met at the beginning of each week to talk about the haptic techniques and activities to be taught throughout the week. I worked in close consultation with Mrs T and created weekly videos of the haptic techniques for her to follow, to ensure that the program was taught in the suggested timeframe and manner. At the end of the SPP we met one last time to discuss the final DEAP assessment and the children's writing samples.

Initial meeting with the teacher

This meeting, essential in addressing DGP 13, took place after school. I presented the theory behind the SPP and the pedagogy within the program as described during the development of the 13 DGPs. We discussed each child's SPP content and the SPP sequence for each student. Mrs T had worked with small-group initiatives previously and had experience with the Reading Recovery program (Clay, 2002, 2005), which was similar in lesson delivery. She was excited about the SPP and looked forward to using the haptic techniques. As we were in a primary school, we decided to look for available resources at school to assist in the teaching of the program before leaving for the day. Mrs T located the "Indij readers" in the library, which are a collection of books, often with multiple copies, that

provide insight into the connection to the nature and the land and Aboriginality

(<https://indijreaders.com.au/>).

Mrs T found appropriate books to match the phonemes to be taught. I looked through library resources, my personal belongings, and internet sites for phoneme cards that included the phoneme, a picture, and a word for each sound, in initial, medial, and final positions. I also downloaded the Australian version of the application “Speech Sounds for Kids” from the Apple App Store (<https://mmsp.com.au/speech-sounds-for-kids/>). This application helps teach children phoneme sounds, and was the only application I could find that used an Australian accent, making it the most appropriate version for Australian children. We both looked through school and personal resources to locate other resources such as craft sticks, magnetic letters, plasticine, kinetic sand, scrap books, markers, and pencils. I made some playdough and gave it to Mrs T before she began teaching the program. Once we had collected what we could, we further discussed the sequencing of the SPP. Mrs T was concerned she might mix up the sequence of the games, and I assured her that it would not matter as they are designed to help students consolidate their articulation. Which game she used didn’t matter as long as she was revising the focus sound for that lesson. Mrs T was relieved and said she felt more confident. We talked about the students’ use of substitutions, and I explained the initial DEAP assessment articulations and substitutions to Mrs T so she would have a clear understanding of each child’s needs.

The lesson sequence, which is illustrated in the sample program (Appendix F), was presented to Mrs T, and she agreed that it seemed to link the phonemes and their substitutions in a logical progression from the sound children substituted the most often to the ones they substituted rarely (Ouellette & Haley, 2013). Mrs T’s approval as an experienced educator provided additional confirmation of the potential efficacy of the SPP and its connection to meeting each of the DGPs. Once Mrs T had the lesson progression for each child, our

discussion moved to pedagogy. I explained the theory of using language play to encourage enjoyment through fun-filled activities while also focusing on drill and practise of phonemes. I talked about the different games within the SPP and we played them briefly so Mrs T would know how to teach them. We trialled rhyming games, real and nonsense word identification games, sound match-up games, and pronunciation games. Once Mrs T seemed familiar with the games, we talked about an anchor to help children remember the sound. For example, a picture of a fish might remind a child how to say the /f/ sound. This anchor could be placed on the wall or somewhere where the child would be able to refer to it (Clay, 2005). Mrs T agreed that this could be easily completed during the lesson when the phoneme was introduced, or during the first lesson that concentrated on a particular sound. Mrs T agreed to incorporate this idea into her lessons.

The concept of taking a sound from language, teaching its pronunciation, and slowly placing it back into context was reinforced (Ehri et al., 2001; Frost, 2001; Ouellette & Haley, 2013). I explained that this process begins by teaching the sound orally through the haptic technique, verbally practising it, and beginning the process of blending the sounds together and joining segments of words to identify words. I used the word “tree” as an example: begin with /t/, add /r/ and lastly add /i:/. I recommended using the picture, phoneme, and word cards to support teaching the process. We discussed ways of placing the words into sentences or reading sentences with the sound already embedded in them. Mrs T agreed that the “Indij readers” would help with the reading, and we talked about different ways to make sentences. Together we brainstormed and found resources for words with the sounds to be taught in the initial, medial, and final positions. We considered the different tactile resources and decided it was important, although sometimes inconvenient, to use them to encourage engagement and make learning enjoyable. As Acton and his colleagues (2013) emphasise, activities that engage the senses enhance retention.

Mrs T raised the notion of using Indigenous pedagogy. I reiterated that by using modelled, guided, and independent learning experiences we were implementing Indigenous pedagogy, and expounded on the Indigenous pedagogy that I had embedded within the program based on my research from all the sources of information. I asked her to remind the children at the beginning of each lesson that their Indigenous language is valued, as part of discussing language differences and setting the learning goal for the lesson. I reminded her that Indigenous children needed to understand why they were engaging in the lesson to enable them to build on their prior knowledge. Mrs T knew about the “Eight Ways of Learning” (Yunkaporta, 2009) and was initially concerned that we were not using them. To address her concerns, I talked to her about the ‘Deconstruct/Reconstruct’ strategy (Yunkaporta, 2009, pp. 47-48) within the “Eight Ways of Learning”. I explained that talking to the children about the relevance and importance of learning the phoneme deconstructed the learning activity, and the modelled, guided, and independent learning provided the reconstruction section of the strategy. She recognised that we were following the strategy and was content with the explanation. Such a discussion was necessary in ensuring her full understanding of the underlying theory and principles of the SPP, particularly its connection to Indigenous ways of learning (DGPs 10 and 11).

Finally, we discussed the first two haptic techniques to be used with /θ/ and /f/. I worked with her until she was confident that she could use the techniques to teach the children the two sounds (Appendix F). I gave her my iPad with the application “Speech Sounds for Kids” already set up to use with the children, and showed her how to use the app. I showed her the video recordings of myself completing the haptic techniques, and gave it to her. The video served as a reminder if she needed further support in remembering the technique when teaching it. I also reminded her that she could contact me at any time should she require further assistance. I checked that she was confident with the sequence of the SPP for each

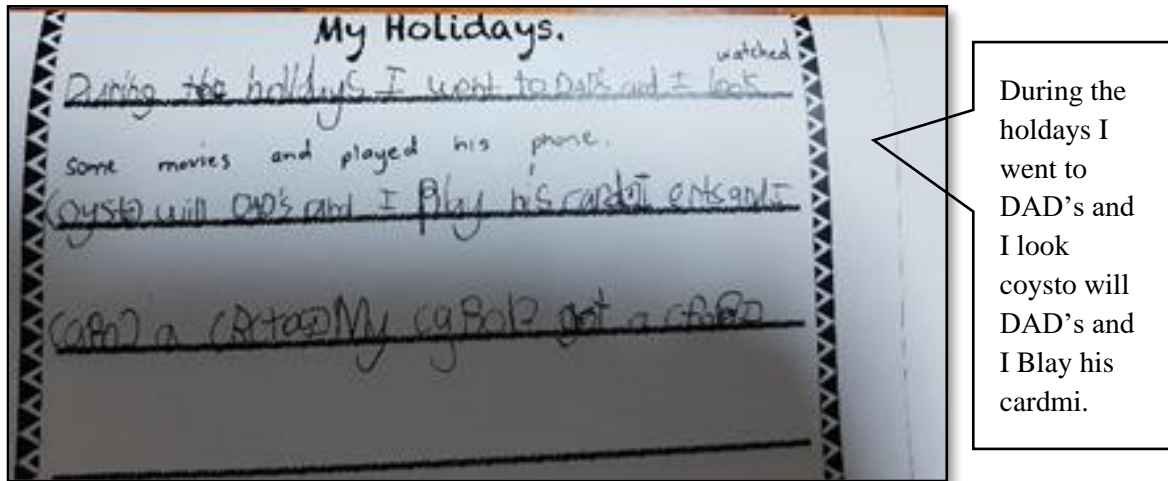
child and we ensured the room in which she would be working in was set up for the lessons. When we felt that everything was ready for the first lesson, the meeting closed.

Follow up meetings with the teacher

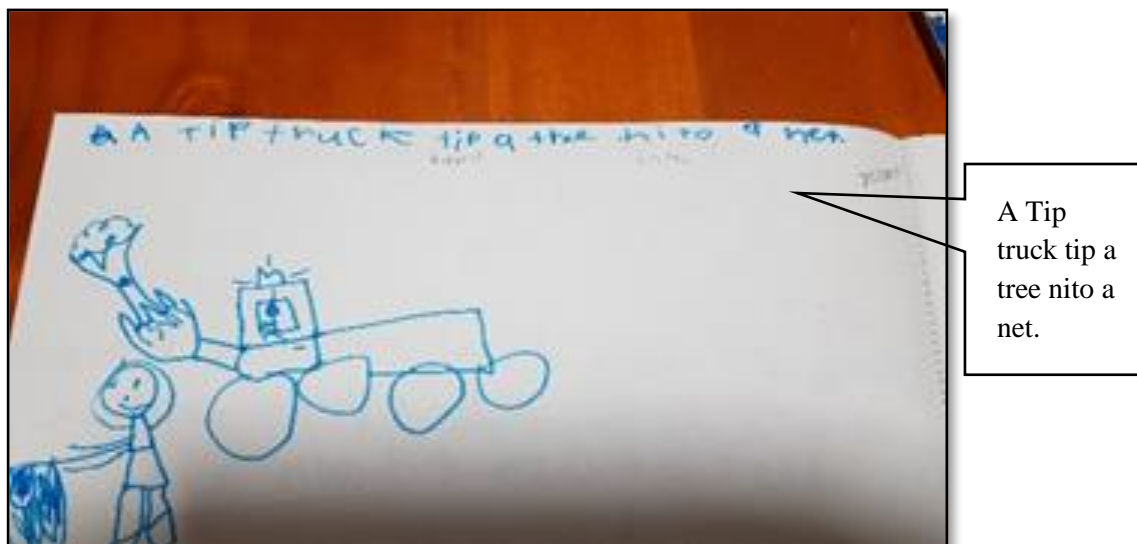
Mrs T and I met at the beginning of each week for about 20 to 30 minutes to discuss the lessons for the week, particularly the haptic techniques. This allowed time to work through the physical process of teaching the technique. I checked that Mrs T was confident with the games for the week and reminded her that if she needed to change the game she could, especially if a child asked to play a particular game. These weekly meetings became more focused on what the children were doing rather than the haptic techniques as Mrs T became more confident with teaching using these techniques. We discussed writing samples, viewed recorded lessons, and considered further ways to support the children back in the classroom. An example of this is in Emily's writing. Mrs T was concerned about Emily's retention. She explained, "It's like I have to reteach the sound every time I see her. She has forgotten what we did in the previous lesson." We thus decided to continue to remind Emily of the phonemes previously taught and try to give her a little more intensive practise. We noticed that her writing had markedly improved (Figures 4 and 5 below). Emily had moved from words with jumbled letters that didn't seem to follow phonetic coding to words that were all legible and easy to read. She had one error where the word 'into' was written as 'nito'. Emily had used the letter 'p' accurately in the word 'tip' in the second writing sample whereas in the first writing sample she had used the letter 'b' in the word 'play'. She wrote 'blay'. Emily's second writing sample demonstrated that she was becoming more aware of using the sounds of letters in the words she wrote. We decided that at the end of the SPP we would approach each child's class teacher and ask them to provide a wall space where their picture prompts could be placed. That way the children could refer to them when needed.

Figure 4

Emily's pre-program writing

**Figure 5**

Emily's writing during the 15th lesson of SPP



Another concern was student absences. These were beginning to interrupt the flow of lessons. We decided the most useful way of dealing with these was to accelerate some children when other children were absent and then catch the other students up when they returned to school. We needed to be flexible with our implementation and timing to accommodate attendance patterns. Connor and Emily were both absent for two consecutive lessons, which slowed their progression through the program. However, when Brian missed four lessons in succession, Connor and Emily's lessons took place during his lesson time, which brought them back into alignment with the rest of the students. Brian caught up at the end of the program. This was possible because each student had a program that was designed based on their personal phonological needs. For example, Brian required fewer lessons than Emily, as he had less phonemes to learn. Amy and Diane attended all their lessons. In total Brian had 18 lessons; Connor, Amy, and Diane had 21 lessons each; and Emily remained a little longer and had 27 lessons.

Mrs T maintained detailed written observation notes during lessons, and collected work samples and photographs of the children's work as evidence of their progress. She regularly celebrated the children's successes and ensured that they were rewarded with school merit awards. We also daily discussed the content and pedagogical practices that could be adjusted for children struggling with a particular sound. For example, with Emily we decided that /θ/ required constant revision, so it was discussed and if necessary, included in the lesson to reinforce its pronunciation. The following five descriptions provide insight into the children's sound acquisition during the program. This commences with Amy.

Amy. At the time of the study, Amy was seven years and eight months old, and was enrolled in a Year Two class. She spoke English both at home and at school. Amy's grandfather spoke Gundungurra, a dialect of AAE. Amy's grandfather didn't see Amy very often as he didn't live in the area. In her interview, Amy's mother suggested that Amy had

some trouble with her speech. These “mix-ups” included the stops /d/ and /t/ and the nasals /m/ and /n/, and sometimes she mispronounced /s/. Amy’s mother also indicated that in writing she mixed up “f” and “ph”.

When Amy’s teacher was consulted, she expressed concern about Amy’s speech and stated: “Amy is just being lazy.” She emphasised that based on her observations, she thought Amy was struggling in particular with /θ/, /f/, and /s/. These concerns didn’t match most of what Amy’s mother had observed about Amy’s oral pronunciations. Both Amy’s teacher and mother noticed her mispronunciation of the /s/ sound. Amy’s teacher recommended that she slow down her speech and carefully articulate each sound before using it in activities or writing it down. She had mentioned this to Amy but felt she had not fully listened to her recommendation.

The initial DEAP assessment demonstrated that Amy required a focus on /θ/, /ð/, and /dʒ/, as she was substituting them with /d/, /t/, and /f/ respectively. These sounds and their substitutions required specific teaching and pronunciation training. Her DEAP results aligned with some of the sounds identified by Amy’s teacher and mother: /θ/ and /f/ were sounds that Amy’s teacher noticed that she struggled with, and /d/ and /t/ were sounds Amy’s mother recognised as occasional mispronunciations. My assessment was that if Amy were able to articulate both the target and substituted sounds, her literacy would be enhanced. The other sounds – /s, m, n, v/ – that Amy had articulated accurately throughout the DEAP assessment were not added to her SPP content. It’s interesting to note that Amy’s mother and teacher both identified /s/ as a sound Amy mispronounced, but as the DEAP assessment did not find this to be the case it was not included in her SPP. However, /dʒ/ was added in lessons 12 to 15, as she had substituted it with /d/ in the DEAP assessment. Amy’s SPP teacher, Mrs T, began lessons slowly and focused on sounds Amy was confident articulating prior to focusing on the target sounds.

Mrs T observed that Amy enjoyed using the haptic techniques that involved the use of a craft stick. Amy's personal craft stick was stored in a plastic envelope, labelled with her name, in order to ensure other students didn't use her craft stick by mistake. Mrs T mentioned that Amy would often find the craft stick and be ready to begin practising the haptic techniques at the beginning of the lesson before sitting down. Amy would say "I know, I know", and show Mrs T how to do the haptic technique to the best of her ability. Mrs T initially thought Amy was simply amusing herself with the craft stick, but on entering her classroom one day, found Amy practising the haptic techniques in the corner with a friend.

Brian. At the time of the study Brian was an eight-year-old boy enrolled in a Year Two class. Brian spoke English both at home and at school. His grandmother could speak Maltese. Brian's other grandmother identified as an Australian Aboriginal and his grandfather was Scottish. Brian's mother commented that he knew all his sounds and usually pronounced them accurately. She was aware that his teacher was concerned about some of his pronunciations and agreed to allow Brian to attend the SPP to support his learning. Brian's mother was not aware of the language group or dialect of English her mother-in-law may have known or spoken with other Indigenous people.

Brian's teacher was concerned about some of his pronunciations, particularly when he mixed some sounds up. She demonstrated this by showing a writing sample where Brian had written "j" for "th" in the word "think". Brian's teacher thought that he was unsure of his letter sounds at times and would simply substitute anything when confused. Brian's DEAP assessment revealed confusion when articulating /θ/ in the word "teeth", which was substituted with the /f/ sound, and /dʒ/ in the word "sausage", which was substituted with /z/. Considering that Brian's teacher was concerned about some of his pronunciations but didn't specify which sounds he mixed up, the SPP was an opportunity to help Brian consolidate some of the other consonant sounds that were identified as having a connection to AAE

phonological features. This allowed the teaching of the same program content as with Amy's SPP. The program taught all of the sounds identified by the DEAP assessment except for /z/, which does not have a connection to AAE (Toohill et al., 2012).

Brian was a confident, happy child who, when asked whether he liked working with Mrs T, said, "I like coming here because it is fun. You get to do fun games and Mrs T does this funny thing with a craft stick." Brian mimicked Mrs T in lessons, which she found a little distracting, and he always tried to trick her in games. This was particularly evident when Mrs T and Brian played the card game Snap. Brian would try to get Mrs T to say the sound inaccurately so that he would win the cards in the stack and thereby win the game. Mrs T and I decided to reduce the number of lessons on /d, t/, and /ð/ from three lessons per sound to two lessons per sound, as we didn't want Brian to become bored and disengage with the program. These sounds were not identified as areas of need, but rather as revision sounds. For this reason, Brian's reduction of one lesson per sound (for 3 phonemes) facilitated his completion of the SPP three weeks ahead of time.

Connor. Connor was six years and 10 months old and was in a Year One class at the time of the study. Connor was the youngest child enrolled in this iteration. His parents were not willing to talk about their heritage. Connor's mother was only happy to acknowledge that Connor was of Aboriginal descent. She was happy for him to participate in the program and said that he did not say all his sounds accurately all the time. Connor's mother thought he knew most of his alphabet sounds and said he had no learning difficulties that she was aware of.

Connor's teacher said that he was still learning /ʃ, ʒ, θ/, and that these sounds had been taught while Connor was in her class. She was also concerned about his use of /f/ and /dʒ/. She said he tried hard to contain his energy and found it difficult to maintain

concentration at times. Connor's teacher also said that he would refrain from answering if he was not sure of the answer, and needed a lot of coaxing to elicit a response at times. Connor's DEAP assessment revealed /θ/ substituted with /f/, /ð/ substituted with /v/, and /dʒ/ substituted with /g/. He responded to the DEAP assessment happily and seemed to enjoy taking control of the pictures. He enjoyed talking about the silly pictures at the end of the assessment. He laughed at the picture of a sheep pushing a tomato in a pram and said, "That's silly – the tomato is a baby and sheep don't push prams!"

The SPP content for Connor was similar to Amy's as it included the sounds /θ, ð, f, v, dʒ/. Amy's content involved /t/ and /d/, with /v/ removed, while Connor's content included /v/ and had /t/ and /d/ removed. These simple content adjustments made the SPP more relevant for the children and enhanced their engagement. Connor was compliant and engaged with the lessons, and Mrs T said he was always happy to share something funny. For example, one day he wrote a story: "I can see a tiger laying in the tree and I can see a turtle swimming in the water with a taco in its mouth." When I asked him whether he liked working with Mrs T he said that he liked trying to beat her in games and that he usually did.

Diane. At the time of the study Diane was eight years three months of age and was enrolled in a Year Two class. Diane spoke English at home and had Scottish and Australian Aboriginal heritage. Her grandmother spoke Wangkumara. Her family came from Tibooburra, which is in Wangkumara country, 1,187 kilometres northwest of Sydney in New South Wales. Diane's mother said that she did not know all her alphabet sounds as she suffered with some hearing loss. She felt that Diane did not pronounce some of her sounds accurately and that this might be due to her hearing loss, but she was unsure if this was the case. Diane's mother felt that these factors affected her learning.

Diane's teacher said that she mixed similar sounds, and gave as an example a writing sample where Diane had written the word "doctor" as "boctor" and "dumped" as "bumbed". She said that sometimes it was very difficult to work out what she had written because of her mixed-up letters. Diane's teacher did say that she usually understood what she was saying, that her speech was fairly clear, and if she mixed sounds up you could usually work them out. She thought that a speech pathologist might also help her learning. Diane's initial DEAP assessment showed /ð/ substituted with /f/ and /d/, both in the medial position, and /θ/ substituted with /f/ in the initial position. All other phonemes were articulated without substitutions.

Diane's SPP content became complex. Knowing that she was unsure of her sounds, had some hearing loss, and demonstrated some substitutions, Mrs T and I decided to focus her program on /ð, θ, f, d, b/. These sounds were a combination of the sounds Diane's teacher said she was mixing up along with those identified by the DEAP assessment and their substitutions.

I caught up with her one day on her way to a lesson with Mrs T. She was carrying a coloured craft stick. I asked her what she was doing and she said she was on her way to see Mrs T to tell her she had taken her craft stick home to show Mum the /θ/ sound. She was very excited that she had got it right and was almost exploding with enthusiasm to tell Mrs T. Throughout the SPP lesson sequence Mrs T said that Diane didn't find the pronunciation easy but worked hard to get it right. Mrs T said she always had a smile on her face when she came to lessons. Diane's SPP was three lessons longer than the other students' programs to accommodate the extra sound.

Diane's teacher said she could see that Diane was thinking about the pronunciation of the sounds when working in groups and often put her hand to her mouth and said the sound to

ensure she got it right. She felt that it was a positive step towards improving her spelling and reading. Mrs T said that Diane never gave up trying. If she didn't get the appropriate articulation the first time, she would do it again, with Mrs T's help, until she did. She didn't need to be asked to work through it again; she would just say "again".

Emily. At the time of the study, Emily was enrolled in a Year Two class and had just turned eight. She spoke English at home. Emily had just celebrated her birthday and happily gave me a cupcake in celebration of the event. She was of Australian Aboriginal and Scottish descent. Her mother said that they, meaning their family, had only recently found out about their Aboriginal heritage. Their family came from Moree, or Kamilaroi country. Emily's mother said that they had been estranged from their family and for this reason didn't know much about their Aboriginal language. She thought that Emily knew all her alphabet sounds but didn't always pronounce them accurately. Emily's mother thought that this would have an impact on her reading and writing. Emily's class teacher said that Emily struggled in English and was already working intensively with a learning-support teacher, and suggested that she might benefit from speech therapy. She said that Emily often confused basic alphabet sounds and mixed them up in her writing. She showed me a writing sample where Emily had written "b" for /f/ in the word "four", "d" for /b/, and "f" for /ð/ in the word "brothers". She wrote, "I have bor drofers." In the initial DEAP assessment, Emily had the largest variety and number of substitutions of all the children who had completed the initial DEAP assessment.

Mrs T and I spoke about the lesson content for Emily. The problem we encountered involved the number of target sounds and substitutions that had emerged during Emily's DEAP assessment. All of the sounds were features of AAE and required some attention in the program, but we only had time to do nine sounds. We decided that /j/ would not be added to the SPP even though affricate and fricative alternation is a feature of AAE. We made this decision to allow sufficient time for the other sounds to be adequately addressed. Emily's

substitution had occurred on one occasion, and /ʃ/ was not a sound she used frequently as a substitution. The SPP content for Emily became /ð, θ, f, d, b, v, p, t, dʒ/. Mrs T said that Emily was always willing to “have a go” at everything but was worried about making mistakes. She mimicked Mrs T’s pronunciation and practised her pronunciation in other settings. I caught her one day continually repeating the word “teeth” with an emphasised /θ/ sound. Emily enjoyed telling stories about her family and her pets. On one occasion she insisted on telling Mrs T about her new puppy. She would not stop talking about her pets until she got through a whole list of pets, all 16 of them. Then she focused and was happy to begin the lesson.

Results of Iteration 1

At the conclusion of each child’s SPP, I completed the second DEAP assessment with them, using the same protocols, and collected writing work samples. The data derived from these sources assisted in the evaluation of the SPP (Table 11 in the Supplementary Material section contains the results of the children’s initial and final DEAP assessments).

Overall, 22 more target phonemes were articulated correctly in the final DEAP assessment following the SPP than in the DEAP conducted prior to its implementation (71% more target phonemes articulated). Amy, Brian, Connor, and Diane articulated 18 target phonemes that had not been articulated in the initial DEAP assessment (58% more articulated). Brian articulated all target phonemes accurately. Amy, Connor, and Diane also articulated all of the target phonemes accurately except for /ð/, which was substituted with /f/ on one occasion; for each student this was in the medial position. Emily accurately articulated /θ/ in the medial and final positions, which she had substituted with /f/ in the initial DEAP assessment. However, she used one /θ/ substituted with /f/ in the initial position in both DEAP assessments. Emily accurately articulated /b/ in the medial position and on one

occasion /ð/ in the medial position. This demonstrated an improvement in the pronunciation of sounds in four articulations. She used /t/ substituted with /k/ during the final DEAP assessment, which was articulated using the target phoneme in the initial DEAP assessment. According to the literature the phoneme /k/ has not been identified as a feature of AAE (Butcher, 2008; Eades, 1993; Eagleson, 1982; Kaldor & Malcolm, 1982, 1991). Students' progress in the SPP was further analysed to establish whether the substitutions made were phonological features of AAE. Eight of the nine substitutions could be described as phonological features of AAE, and the remaining substitution where /k/ was substituted for /t/, as mentioned above, was not found to be a feature of AAE.

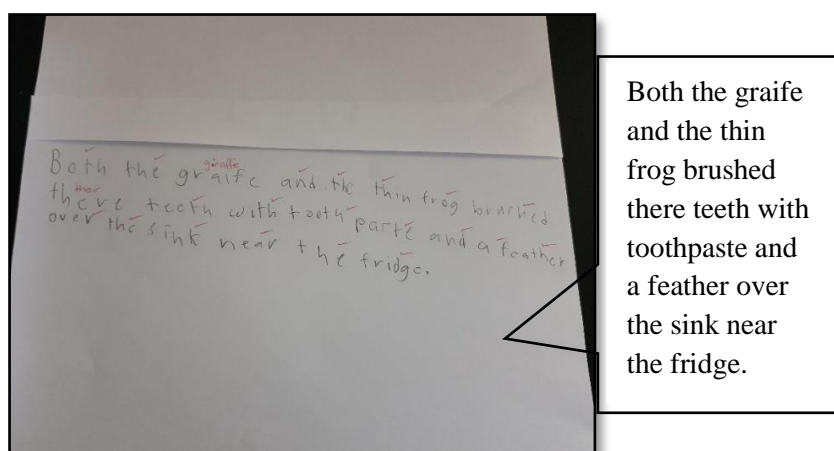
The feature that demonstrated the greatest resilience to intervention was where /ð/ was substituted with /f/. Due to the number of students who continued to substitute /ð/ with /f/, future programming should have a greater emphasis on /ð/, possibly in the form of more time allocated to it. Emily's responses indicated that she requires a more rigorous program of longer duration with this phoneme.

To ascertain whether the children were transferring their knowledge from their learning of the articulation of sounds to other learning tasks, particularly writing, work samples were collected from each participant in the form of a dictation passage that read, "The giraffe and the thin frog both brushed their teeth, with toothpaste and a feather, over the sink near the fridge." The dictation passage was constructed to target the focus sounds /θ, ð, dʒ/ and the substitution sounds /f, v, t, d, b, p/ in most phoneme positions. The students at times also used other consonant phonemes, such as /n/ and /l/, unusually in the dictation passage, but these phonemes were not included in this discussion, as they were not part of the program (Table 12 in the Supplementary Material section of this thesis provides further analysis of the work samples).

Of all the children, Brian seemed to benefit most from the SPP. He was able to articulate all the sounds accurately by the end of the SPP and wrote and read all the target sounds accurately in his final dictation passage (Figure 6). Brian’s target sounds were /θ, ð, dʒ, f, d, t/.

Figure 6

Brian’s writing assessment at end of Iteration 1



The other children found the dictation passage to be a little more challenging. Connor wrote all the target phonemes correctly in either initial, medial, or final position. He did, however, use “j” for /dʒ/ in giraffe and considering this is how /dʒ/ is pronounced, I didn’t consider it incorrect for the purposes of this study, as it indicates awareness of the appropriate sound. Amy, Diane, and Emily wrote most of the target phonemes correctly in either the initial, medial, or final positions. Amy wrote /dʒ/ in “fridge” with “ge”, Diane wrote “t” for /d/ in “brushed”, and Emily wrote “gi” for /dʒ/ in “fridge” and “sh” for /dʒ/ in “giraffe”. The number of target phonemes written correctly exceeded the number of target phonemes written with other letters or omitted.

Amy, Connor, Diane, and Emily used /ð/ substituted with /f/ in the medial position within the word “feather”, in both their pronunciation and their writing. The phoneme /ð/ in

the medial position appeared to be the most problematic sound for children to both articulate and write. It is a phonological feature of AAE. As pointed out in Chapters 1 and 4, children tend to write the way they speak (Frost, 2001). Amy, Connor, Diane, and Emily continued to articulate /ð/ substituted with /f/ in the medial position within the word “feather”. In writing, Amy, Connor, Diane, and Emily wrote substitutions for /dʒ/ in the word “fridge”. They were all different substitutions but each one contained the letter “g”. There are many possible explanations for this, some of which involve the different ways of spelling /dʒ/ and that children may have visually recognised the “g” in the word prior to the writing task.

The work samples gave some insight into the children’s transference of sounds into written text. However, the children did not complete writing samples before the SPP implementation, so I could make no comparisons of their progress. The idea of collecting work samples prior to the implementation of Iteration 2 was discussed at the next focus group meeting and with Mrs T.

Final meeting with the teacher

My final meeting with Mrs T involved a celebration of achievement. We looked at where the children had started and what they had achieved. We were extremely pleased to observe that all of the children had made considerable improvement in their articulation (Table 11 in the Supplementary Material section). The greatest improvements were from Amy and Connor, who had reduced the number of substitutions from eight in the initial DEAP assessment to one in the final DEAP assessment – a reduction of seven articulations each. Emily had successfully reduced the number of substitutions from 10 in the initial DEAP assessment to six in the final DEAP assessment. Both Brian and Diane had reduced their substitutions by two.

We were both pleased to see the progress the students had made, and at this point thought that we should have spent a bit more time on teaching /ð/ and /f/, given that four of the children confused these sounds in the final DEAP assessment. This included Emily, who reduced her number of substitutions by four. In the initial DEAP assessment Emily made a total of 10 substitutions. We decided that in Emily's writing, most of her single-letter sounds were written correctly but her double letter sounds that had substitutions in her final DEAP assessment (/θ, ð, dʒ/) were replaced with letters in her writing sample. We concluded that she required a more intensive speech and writing program to further support her learning. Based on the DEAP assessment results and the analysis of the dictation writing samples, Mrs T and I were satisfied that the SPP had supported the children's learning. Mrs T suggested that even though Emily had considerable learning difficulties, she had made progress using the SPP.

We discussed the haptic techniques and both agreed that they were enjoyable for both the student and the teacher. Mrs T highlighted the way children had had fun with the techniques, and that often the children had been eager to begin the lesson because of the techniques. One child had been observed practising with a craft stick in her regular classroom and another student borrowed the craft stick to take home to show her carers. This behaviour, coupled with the comments children had made about learning the haptic techniques, provided some evidence that the haptic techniques were effective within the program. According to the teachers, they were also an enjoyable way to teach pronunciation. At the conclusion of this meeting Mrs T offered to write down some of her thoughts regarding the SPP's implementation:

I believe that the SPP could be offered to students from five to eight years of age who present with phonologic pronunciation discrepancies. The program can be individualised to target the particular sounds. The success of the program was not

only the individualising of the program but also the ongoing repetition of the sounds, four days a week for 20 minutes a day. This proved to be a vital part to the student's success.

Focus-group discussion and feedback

Pre- and post-Iteration 1 DEAP assessment results (as set out in Table 11 in the Supplementary Material section) and the dictation writing samples (as set out in Table 12 in the Supplementary Material section) were emailed to all focus-group participants, and a meeting time was organised based on the participants' schedules. They were reminded about the discussion guidelines, as outlined in Chapter 3, and informed of the questions to be discussed:

1. Why was the iteration effective/not effective?
2. How can the SPP be altered/adjusted in order to improve its effectiveness prior to the next implementation (iteration)?
3. How do you think the SPP should be implemented?
4. Do you have any suggestions to enhance the SPP or its implementation in Iteration 2?
5. Do you have anything you'd like to discuss?

I approached Mrs T and asked her if she would like to present anything at the meeting. She already knew that the focus-group members had copies of the results. She agreed and joined the focus-group meeting. All three local members were present, and two of the interstate members used Skype to join the meeting. The final member was caught up in a meeting and was unable to attend. She joined the discussion later via email.

To open, I ran through the meeting guidelines and highlighted the students' progress throughout the iteration using the comparison of information from the DEAP pre and post assessments and the writing samples. This was followed by a discussion of the teacher's

experience working with the program. She explained her previous experiences working with Indigenous students in the school/s and highlighted her frustration in struggling to get support for Indigenous children in their SAE pronunciation. She went on to say:

Some of these students I had taught on individual intensive programs during the two years previously and it was very pleasing to see that with the correct instruction of the pronunciation of sounds, speech exercises, and repetition of sounds that there was finally evidence of success in this area for these students. This was also evidenced in their reading, writing, and talking and listening activities in the classroom. These students were monitored in the classroom and their teachers were aware and great at prompting them to get their mouth in the correct position. As time went on these Aboriginal students were able to notice their own pronunciation substitutions and some written approximations and self-correct them independently. Fostering independence and getting students to self-regulate and monitor in reading, writing, and speaking is what we aimed to do.

She followed this statement with a demonstration of one of the haptic techniques used in the SPP and showed one student's /θ/ work. She demonstrated the first /θ/ lesson, including the haptic technique used to teach the sound. Following this presentation, I brought the focus group's attention back to the initial question: Did we think that the first iteration of the SPP was effective? One of the focus group members also happened to be a teacher of one of the student participants. She was very excited to share her thoughts. She said, "Connor has been using his hands to work out how to say some of the sounds and I can see that this is helping him when he is reading and writing." She also offered to leave the meeting and go and get some of Connor's writing to show his improvement. I assured her it wasn't necessary and the conversation continued. Another participant said, "The results

speak for themselves, in that we can see the progress. I think it is interesting that a straightforward technique, like the haptic technique, can have such a huge impact on kid's learning." We took a vote to be sure that everyone agreed that the SPP had been effective, and a second vote to see if they also agreed that the SPP had supported the learning of reading and writing. They all agreed that it had been effective.

The conversation moved naturally along to how we could make something that was effective even better. One focus-group member (a university lecturer) suggested that perhaps inviting Indigenous adults to assist in the program would help to reinforce learning at home. Everyone in the group agreed that this was a really good idea but would not work practically. As one participant (a class teacher) suggested, parents may feel that we are imposing SAE on their children and forcing them to speak it at home. Another member proposed the idea of homework, but the majority of members agreed that parents should not feel pressured to teach their children a dialect of English at home that may not be the dialect they would prefer their children to use.

I suggested that it would be useful to have a dictation passage completed at the beginning and at the end of the SPP, so that writing samples could not only be analysed based on written sounds but also compared and improvements determined. All focus-group members agreed that this would be a worthwhile activity for the next iteration. One said, "That way we will be able to see if they are using the sounds correctly in their writing, or if they have made any improvement." They agreed that the timing and timetabling of the program was effective and that it could only be implemented in a quiet setting on an individual basis to be effective. This was reinforced by Mrs T, who said, "The teaching of the program during the morning session made the lesson sequence flow. The children could recall the previous lesson and be reminded about the sounds they were working on. It helped with retention." It was recommended that the SPP be implemented in the same way,

with the inclusion of pre and post dictation passages that contained the focus phonemes. Focus-group members agreed that the same dictation passage used in Iteration 1 was to be used in Iteration 2.

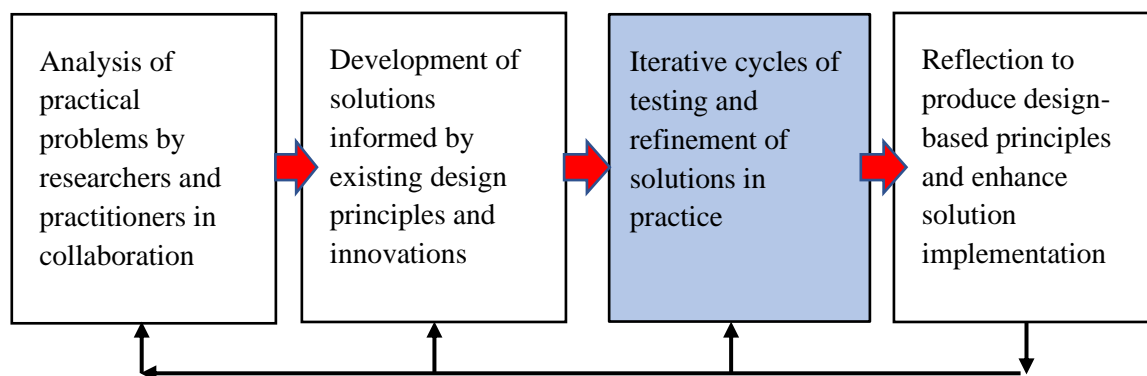
I closed the meeting at 35 minutes, with the agreement that the SPP should run again, with a different group of students, using the same timetable and setting, resources permitting, and should include the same dictation passage both before and after the iteration. I had explained to the group that the timetabling and room allocation relied heavily on the school's resources and said I would endeavour to obtain the same resources from the school principal.

Conclusion

Comparisons between the pre- and post-DEAP assessment results and review of the children's work-samples demonstrated that Iteration 1 had enhanced the children's learning. These outcome were further reinforced by the focus group discussion and feedback. To further refine the SPP design the focus group unanimously decided that, in order to gain greater insight into the impact of the teaching of oral phoneme articulation on children's written text, an identical dictation passage, containing the target phonemes, would be used both before and after Iteration 2. This provision of a writing sample prior to Iteration 2's implementation strengthens DGP 8. It provides a more effective way of analysing the children's ability to transfer their knowledge of phonemes to their writing and offers greater scope for future program design. Due to the positive impact of Iteration 1, there are no changes to the wording of the DGPs.

Chapter 7

Phase Three – Iteration 2: Refinement of the DGPs



Refinement of Problems, Solutions, Methods, and Design Principles

Note: Based on design-based research diagram by Reeves (2006, p. 109)

At the conclusion of Iteration 1, I met with the principal and provided him with a copy of the results, which he asked me to present to the executive team. I described the SPP and the outcomes of Iteration 1 and demonstrated the effectiveness of the SPP during a 25-minute presentation in which I displayed the impact the program had on the students' oral development and literacy skills, through the provision of copies of the DEAP results and the dictation work samples. All the executive-team members acknowledged that the SPP had been a valuable learning experience for the children involved and were very supportive of a further implementation of the program in the following term.

Based on these results, the implementation of a second iteration was negotiated with the principal. While the principal was very much in favour, I was again not able to teach the program because of my other responsibilities in the school. The principal, however, allocated a quiet office space for the SPP, and assigned a casual staff member, Mrs C, to the project and specified her hours of work. Mrs C was given the program as part of her workload, equivalent to two days a week, and was allocated time from the start of each morning through to 1:15pm to work with students and the SPP. While this was the same

number of hours per week as Iteration 1, the teacher was only available for one and a half days each week. Mrs C was not on school grounds during the rest of the week. I discussed this with the principal but he was unable to provide a teacher for the preferred two hours each morning three days a week. The principal and I agreed that the SPP would need to be taught a little differently and that the situation was not ideal. With the principal's approval I began to invite participant students for Iteration 2.

Iteration 2: Student background information

A new group of five children was recruited for participation in the second iteration with the permission of their parent or guardian. Carers of students who had been previously identified by class teachers as possibly benefiting from the program were contacted, and most agreed to their child's participation. Once again, each child's background information was provided by their caregiver. Table 13 summarises the information about the child's perceived pronunciation, dialectal/language heritage, and experiences.

As discussed in Iteration 1, children's heritage, particularly an ancestor's language (such as Kamilaroi), may influence the way children pronounce sounds. Three carers were not aware of a family ancestor speaking a different language. This doesn't mean that they didn't have an ancestor who influenced their pronunciation or that the community, including the Indigenous community, where the extended family often assists in the raising of children (Lohoar et al., 2014), had not influenced the children's articulation of sounds.

Like Iteration 1, Iteration 2 commenced with my administration of the phonology subtest of the DEAP assessment to each child. If the child articulated a sound that was a substitution, I placed it in the student's inventory. For example, Ann used /θ/ substituted with /f/ in the word /θi/ ("three"), so /f/ was placed in her inventory, along with the target sound /θ/.

Table 13*Iteration 2: Participant attributes*

Participant	Gender	Age	Heritage	Dialects/ languages spoken by ancestors	Pronounces SAE sounds accurately	Language other than English spoken at home
Ann	Female	5yr 5m	Australian Aboriginal	Not aware of any	No	No
Bree	Female	6yr 11m	Australian Aboriginal Scottish Irish	Not aware of any	No	No
Collin	Male	6yr 11m	Australian Aboriginal	Wiradjuri	No	No
Dayana	Female	7yr 5m	Australian Aboriginal Maori	Kamilaroi	No	No
Participant	Gender	Age	Heritage	Dialects/ languages spoken by ancestors	Pronounces SAE sounds accurately	Language other than English spoken at home
Eli	Male	5yr 9m	Australian Aboriginal Maori	Not aware of any	Trouble pronouncing sometimes	No

All five children's results were within the DEAP assessment norms. Dayana was six months older than the DEAP test age limit of six years and 11 months, and according to the DEAP assessment guidelines should not be given a standard score. However, as was the case for the children in Iteration 1, I felt that it was important to include her results based on the notion that Indigenous children are often academically behind their non-Indigenous peers (Zubrick et al., 2006). Table 14 (below) provides the children's raw scores.

Table 14*Iteration 2: DEAP assessment raw scores*

Child's designation	Raw score
Ann	275 out of 284 (1 vowel)
Bree	280 out of 284
Collin	277 out of 284
Dayana	278 out of 284
Eli	280 out of 284 (1 vowel)

Sociocultural phonological program (SPP) refinement of content (DGPs 5 and 7)

The Iteration 2 initial DEAP results were analysed using the same processes as Iteration 1 (Table 15 in the Supplementary Material section). The inventories from the DEAP assessment were combined, analysed, and compared to the AAE phonological features found in the literature. This analysis was cross-referenced with the consonants the expert interviewees considered valuable for the SPP (Table 16 in the Supplementary Material section). The majority of the children's inventories were identified as AAE features. The only difference was that Ann and Collin both made a substitution for /dʒ/ that is not identified in the literature as a feature of Australian Aboriginal dialects.

The content of the SPP taught in Iteration 1 (Table 11 in the Supplementary Material section) was compared with the children's inventories developed during the initial DEAP assessment (Table 15 in the Supplementary Material section) for Iteration 2 (Table 17 below). From this comparison an outline of the program began to immerge. Children's needs in Iteration 1 and Iteration 2 were similar. All the phonemes, except /t/, taught in Iteration 1 appeared in the inventories of the children in Iteration 2. The phoneme /t/ was removed and lessons for /p/ and /f/ were developed instead. These phonemes were substitutions used in place of /b/ and /dʒ/, and, as discussed in the development of the individualised SPPs in Iteration 1, awareness of both target phonemes and substituted phonemes should be explicitly taught. This links previous knowledge to the learning experience (NSW Department of Education and Training, 2009). The SPP was adjusted to accommodate /p/ and /f/, and was ready for implementation.

Table 17

SPP phoneme content

Iteration One	Iteration Two
/θ/ substituted with /f/ (initial, medial, final)	/θ/ substituted with /f/ (initial, medial, final)
/dʒ/ substituted with /d/ initial position	/dʒ/ substituted with /d/ initial position
/ð/ substituted with /f/ medial position	/ð/ substituted with /f/ medial position
/ð/ substituted with /d/ medial position	/ð/ substituted with /d/ medial position
/v/ substituted with /b/ medial position	/v/ substituted with /b/ medial position
/ð/ substituted with /t/ initial position	/b/ substituted with /p/ final position
/ð/ substituted with /v/ medial position	/dʒ/ substituted with /f/ final position

The timetable for the implementation of Iteration 2 was considered and an email sent to all members of the focus group requesting their feedback on the lesson sequence. This email suggested teaching each child on a rotation basis so that throughout the day the teacher

would teach each student two separate lessons at two different times: one in the morning and one after the lunch break. The reasoning behind this was that Iteration 1 results were successful and the recommendation from the teacher teaching the program was that teaching a lesson each day allowed for more-intensive repetition and feedback. This lesson sequence was the only practical way to provide this break for feedback and consolidation given the constraints of the particular school environment. The disruption to whole-class routines was considered a disadvantage to this lesson sequence; however, four of the six focus-group participants agreed that it was in the children's best interest to structure the program in this manner.

Initial meeting with the teacher

I had an in-depth meeting with Mrs C to ensure that she was ready to commence the SPP. During this meeting we discussed the program sequence, the outcome of each child's DEAP assessment, and the pedagogy of the program. The initial meeting took place on the morning of Mrs C's first day of work. We both came in early so that we could meet. I followed the same process that I had with Mrs T during Iteration 1. I described the theory behind the SPP, the pedagogy within the program as described in Iteration 1, and the development and importance of the 13 DGPs.

I explained that we commenced the lesson by teaching the sound verbally through the haptic technique (Acton et al., 2013; Burri et al., 2016; Teaman & Acton, 2013). This meant that the children verbally practised the sound and started to blend the sounds together to recognise words. I demonstrated the haptic technique for /b/ and used the word "bat" as an example of how to place a sound into context. For example, "say /b/, then /a/ and lastly say /t/. Now say the word 'bat'". I provided the picture, phoneme, and word cards as support. We talked about different ways of placing the words into sentences and reading sentences with the sounds already in them. I showed her the "Indij readers" and encouraged Mrs C to

use them in her teaching. I recommended she use the tactile resources, including playdough, which I had made to be used throughout the SPP. Mrs C agreed that it was important to use the resources available to encourage engagement, make learning enjoyable, and promote retention (Acton et al., 2013). I reminded her that activities that engage the senses enhance retention and that this was the main reason for the use of haptic techniques (Acton et al., 2013; Baker, 2017; Burri et al., 2016; Mister-Colmenares et al., 2020). I taught Mrs C the haptic technique for /θ/ and highlighted the importance of using haptic techniques as accurately as possible. I gave her my iPad that had the Australian version of the application “Speech Sounds for Kids (<https://mmsp.com.au/speech-sounds-for-kids/>) on it and suggested that she use it to help teach the SPP sounds. I gave her a quick demonstration of how to use it to help teach the SPP sounds.

We discussed each child’s SPP content and the SPP sequence for each student. Mrs C had worked with small-group initiatives previously, such as small groups aimed at supporting students in particular curriculum outcomes. She had not participated in a program similar to the SPP. Mrs C was eager to be a part of the program and motivated to assist children with their oral language. She said she was eager to use the haptic techniques and see how children responded to them.

We talked about the phonemic-awareness strategy of substitution (Ehrich et al., 2010; Frost, 2001; Ouellette & Haley, 2013) and I reiterated the importance of this skill. I stressed that both the target sound and the substitution should be clearly taught and differences recognised so that important links could be made to the children’s previous knowledge and understandings.

Mrs C and I reviewed and discussed the initial DEAP assessment articulations and substitutions. This provided her with a clear understanding of each child’s needs (Table 13 in

the Supplementary Material section). The initial DEAP assessment of Iteration 2 accentuated the frequency of phoneme substitutions, with /θ/ identified as the phoneme most often substituted. In most of the articulations (14 out of 16), /θ/ was substituted with /f/. Consequently, the SPP lesson sequence was designed to begin with these phonemes: /θ/ was to be taught first, followed by /f/. Since /ð/ was another phoneme regularly substituted by /f/, I decided that it would be taught next. The lesson progression then linked with /d/, the other substitution for /ð/, and the phonemes were sequenced according to the articulations and their substitutions. For example, /dʒ/ was placed in the program sequence next, as it was substituted by /d/. Toward the end of the lesson progression /b/ and /p/ were included. This lesson sequence exemplified in my original design of the program was presented to Mrs C. She concurred with the progression that linked the phonemes and their substitutions from the sounds children substituted the most often to the ones they substituted rarely (Hattie, 2012; Ouellette & Haley, 2013).

I introduced Mrs C to the games within the program, and we played some of them so she would have a clear understanding of both their purpose and how to play them. We talked about how to adjust them if needed. This was carried out in a similar manner to the procedure I followed when working with Mrs T in Iteration 1. I explained to Mrs C about anchors to help children remember sounds. For example, a picture of a cake might remind a child how to make the /k/ sound. I provided some cards for the children to create their anchors and suggested that once the SPP was complete the class teachers might be happy to display them in the classroom so the child could refer to them later on (Clay, 2005). Mrs C considered this to be a useful resource for the child and agreed to complete it when initially learning the sound, and to provide access to it throughout the SPP sequence. The concept of taking a sound from language, teaching its pronunciation, and slowly placing it back into context was outlined (Ehri et al., 2001; Frost, 2001; Ouellette & Haley, 2013). I explained that we first

taught the sound orally through the haptic technique, then verbally practised it, and began blending the sounds together and joining segments of words to identify words. Finally, we used the words in sentences and encouraged the use of the sound in writing and reading. Mrs C and I talked about ways of using the sound independently, techniques to place it into words, and, finally, methods to place the words into sentences or reading sentences with the sound already embedded in them.

In addition to this explanation, I demonstrated how a pedagogy that included modelled, guided, and independent learning followed similar principles to that of Indigenous pedagogy (NSW Department of Education and Training, 2006; Scull, 2016; Sharifian, 2008; Yunkaporta, 2009) as set out in the DGPs. I explained the importance of beginning each lesson with a discussion of the value of the student's Indigenous language, the difference between the student's home language and SAE when relevant to the lesson, and the learning goal for the lesson. I clarified the need for the children to understand why they were engaging in the lesson so that they could build on their prior knowledge. Finally, I revised the use of the haptic technique for /θ/ and taught her how to teach /f/, the second sound to be introduced in the SPP. I worked with Mrs C until she was confident in using the techniques to teach the children the two sounds /θ/ and /f/ (the "Awareness and teaching pronunciation" column in Appendix F, /θ/ in Lesson 1, and /f/ in Lesson 4, detail the steps in teaching each sound). I showed her the video recordings I had made of myself completing all the haptic techniques. I left the iPad for her as a reminder of the technique when teaching it. I also reminded her that she could contact me at any time should she require further assistance. I checked that she was confident with the sequence of the SPP for each child, and we ensured that the room in which she would be working in was set up for the lessons. At the conclusion of the meeting the SPP was finalised and ready to begin.

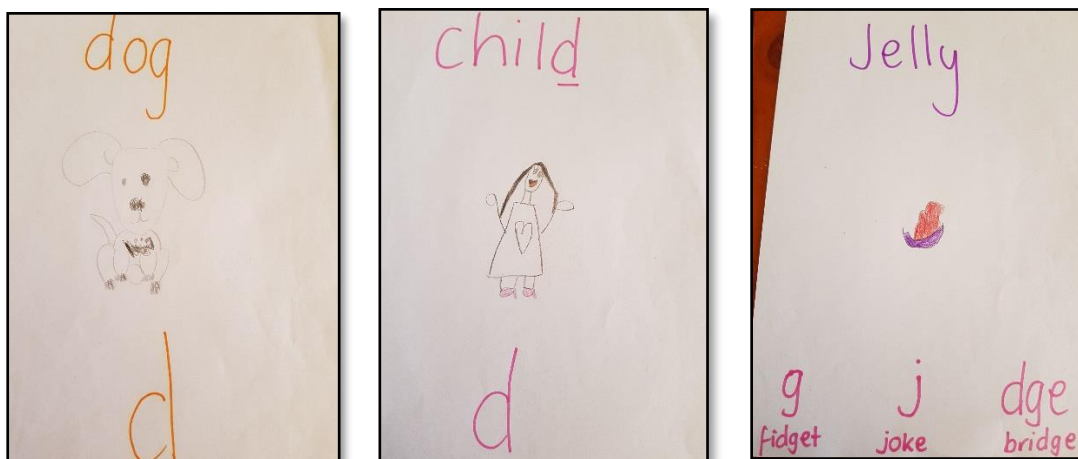
Follow-up meetings with the teacher

Mrs C and I met on Tuesdays (the first day of the week that Mrs C was at school) before school for about 20-30 minutes to discuss the haptic techniques, lessons for the week, and any changes that might need to take place to ensure that the children were learning. I found it important to physically revise the haptic technique with Mrs C to ensure she knew the process. I also checked that Mrs C was confident with the teaching sequence and games for the week and reminded her that if she needed to change the games, she could. We met every week and these meetings focused on the target haptic techniques for that week. Even though Mrs C usually had a clear understanding of the haptic techniques for the week she needed reassurance that she was using them appropriately. We talked about the different activities to monitor student engagement; one day Mrs C said she read a “Indij reader” to reinforce the /d/ sound but found the content of the book to be of little interest to the child she was working with so she stopped reading it and focused on the other activities. I suggested that she trial a different story with a different student. Mrs C mentioned later that the other students seemed to be content reading the stories. We discussed other ways to support the children in the classroom. We provided the children with some picture prompts, with their teacher’s permission (e.g. a picture of three dots with the word “three” on it for the /θ/ sound), to be placed within their classroom.

At the conclusion of the SPP, the picture prompts from the SPP were added to those already within the classroom. For example, some of Ann’s picture prompts are displayed in Figure 7.

Figure 7

Some of Ann's picture prompts



Towards the end of the SPP student absences began to cause concern, as they were beginning to interrupt the flow of lessons. We used the same strategy as Iteration 1 to accelerate some children while other students were absent. When the absentee returned to school, we caught up the lessons they missed. A flexible timetable allowed all students to complete the SPP within the timeframe. Eli, who had the smallest number of focus phonemes, completed the program early. This provided some time in Mrs C's timetable to ensure that everyone completed the program. Ann was absent for three consecutive lessons and Bree was absent for four consecutive lessons, which slowed their progression through the program. Collin and Dayana had lessons during Ann's and Bree's absences, and when they returned they caught up at the end of the SPP. This accelerated Collin and Dayana through the program but ensured that time was used effectively. In total, Bree and Eli had 16 lessons, Ann and Dayana had 21 lessons, and Collin remained a little longer and had 25 lessons in total. This process provided access to the learning each individual student required, as some students needed to learn the pronunciation of more phonemes than others. The following

account of each child's experience provides a greater understanding of the children's sound acquisition during the program.

Ann. At the time of the study, Ann was a student in kindergarten who was five years and five months old. She spoke English at home and her mother was not aware of anyone speaking a different dialect or language at home. Ann's background was Australian and her mother identified as an Australian Aboriginal. Her mother did not know what language group her family came from. She said "I think we come from one of the New South Wales groups but I'm really not sure. Mum came from up north and dad came from out west and they have split up now so I really don't know." Ann's mother was a single parent and did not have contact with Ann's father. She admitted that Ann had done some work on her speech previously but was vague when asked for further details. Her preschool had completed some pronunciation activities with her before she came to school. Ann's mother was unsure as to whether the pronunciation of the alphabet sounds affected her child's learning but was extremely happy to support anything that could help her child improve at school. Ann's class teacher mentioned that Ann often pronounced sounds inaccurately and probably needed speech therapy. She emphasised the impact that speech had on her writing: "Her speech causes mistakes in her writing."

Mrs C and I decided that we would be able to cover all the sounds Ann required, including substitutions, in the SPP. Mrs C reported that Ann had a good sense of humour and really enjoyed games. She observed that Ann worked diligently on the haptic techniques and used her energy during games to try to trick her. Mrs C added, "Ann looks for me each day and is always ready to come to a lesson. She is really engaged and trying hard." Ann's classroom teacher said that she had not noticed much difference with Ann's speech but had observed that Ann was more confident in her responses to questions and was thinking before speaking. She commented, "You can see her stop and try to think about how she is going to

say the word.” Ann’s progress was recorded through the final DEAP assessments and writing samples.

At the end of the SPP it was pleasing to see that she had made progress in both her writing and DEAP assessments. Ann’s mother was happy that she had made progress and said that she could see that Ann was proactively thinking about the words and really trying to pronounce them accurately. Mrs C admitted that Ann seemed to find it challenging to articulate words and was relieved when the results demonstrated a definite improvement. Ann’s class teacher was content that Ann was thinking hard before speaking and really concentrating on the sounds before speaking or writing. She felt that this behaviour in itself was a positive step to ongoing improvement.

Bree. Bree presented as a happy, bubbly child who, according to her teacher, was confusing letter sounds. She was six years and eleven months old at the time of the study. Bree was in a composite Year One/Two class, where she was a student in Year Two. Her mother felt there was something wrong with Bree’s use of sounds but didn’t know how to go about resolving her concern, so she had not mentioned it to anyone at school. She was extremely relieved when we suggested the SPP. Bree’s mother tried really hard to have Bree’s older brother enrolled in the program as well but, at ten years old, he was well above the limits of the SPP. Bree’s stepfather was American and pronounced some words differently. Bree’s mother acknowledged that she didn’t know Bree’s grandparents on her father’s side but knew that one of them was an Indigenous Australian. She said “I don’t know them. They come from out west somewhere and we never made contact with them. When we were together Bree’s dad didn’t want to see them.” Bree’s mother explained that her mother was Irish and her father was Scottish and that both of her parents came to Australia when they were children. Bree spoke a dialect of English at home (other than SAE) and her mother didn’t feel that the way she pronounced letter sounds had any impact on her learning. Her

teacher recognised that Bree articulated some sounds differently. She described her pronunciation by saying, “Bree easily mixes up sounds. She often confuses /d/ and /t/. For instance, in her writing ‘walked’ could be written as ‘walkt’.” Bree appeared to be using the sounds she heard to write words, as the “ed” sound is pronounced as /t/. This indicated that Bree had an understanding of the Alphabetic Principle and was endeavouring to use it in her writing. I felt this was an encouraging understanding to have at the beginning of the program.

I considered the subtle sound of /t/ in the word “toothpaste” and contemplated whether Bree heard the /t/ sound. I asked her teacher for access to her writing book to ascertain if she was spelling words correctly using the letter “t”. I found that in the majority of instances she was using “t” appropriately and no longer considered it for inclusion in the SPP. Bree’s SPP content became /θ, d, f, ð/. Bree worked with Mrs C happily and was engaged with the content.

At the conclusion of the SPP and during the debriefing meeting with myself, Mrs C remarked:

Bree was a happy child who enjoyed the SPP. She particularly liked playing the games and always wanted to beat me. Bree needed a constant challenge. I had to change things up in the games to make them feel different to maintain her engagement. She was keen to learn and do different things. Bree really enjoyed practising her haptic techniques.

From my perspective Bree was a keen participant who worked hard with Mrs C and sought to get all she could out of her lessons. She enjoyed using the haptic techniques (Figure 8; permission to include the photo was obtained from both Bree’s mother and Mrs C via email).

Figure 8

Bree practising a haptic technique with Mrs C



Bree's class teacher thought that Bree was enjoying the program and that she seemed to be more thoughtful about pronouncing words accurately. At the conclusion of the SPP, Bree's class teacher, after observing Bree in the classroom, admitted that she felt inspired by Bree's progress and felt that Bree had made considerable improvement.

At the end of the SPP, Bree's mother was pleased with her progress and could see that Bree was working hard to make sure she spoke the sounds of SAE correctly. Mrs C was also extremely pleased with Bree's progress. She explained:

Bree wrote meaningful, accurate sentences with assistance. For example, to consolidate the letter sounds /f/ and /d/ Bree wrote, "I have fingers and a blindfold and I didn't see a bird." She wrote this sentence with little prompting or assistance with spelling. Bree was willing to have a go without worrying about errors. It was a real step forward for her, as was the accurate pronunciation of her sounds.

Collin. At the time of the study, Collin was an outgoing student who was six years and 11 months old and, in a Year, Two class. Collin did not enrol at his current school until Year One, when he moved from a local school. His grandfather was an Indigenous Australian from the Wiradjuri clan and lived in Orange, NSW. Orange is approximately 265 kilometres northwest of Sydney and is Wiradjuri country (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2018). Collin had rarely seen his grandfather, as he only visited occasionally. Collin lived with his mother and had monthly visits with his father. Collin's mother didn't know the lineage of his father's parents and was estranged from them. She was concerned that Collin didn't pronounce all his alphabet sounds appropriately and worried that this would affect his learning at school.

Collin's teacher introduced me to him by emphasising that he was a bright student who seemed to catch on to concepts quickly. She said, "Often Collin only has to see or hear something once and he can do it, but when it comes to breaking words down into sounds and just focusing on the sound, he doesn't concentrate and keeps making the same mistakes." Collin's mother thought that he just didn't want to think about things that he considered to be unimportant:

If he doesn't think it is necessary or important, he will tell you. For instance, one night I reminded him about how to say the word "light" because he had said "lighd". He said it again, as I had asked, but also said that it didn't matter because I knew what he meant.

Collin's mother went on to describe Collin's speech as "occasionally sloppy, particularly with sounds that are much the same as each other". Collin's teacher advised that Collin seemed to use /f/ and /d/ erratically and thought that he interchanged some sounds from time to time. Collin's teacher and I agreed that giving Collin an understanding of his

pronunciation through the SPP could help him to understand the importance of his articulations and their relevance to his heritage and to his learning.

The target sounds for Collin's SPP were selected based on the interviews with all stakeholders, his DEAP assessment and informal discussions regarding Collin's articulation. I decided it would include /θ, d, f, ð, dʒ, tʃ/. Mrs C and I discussed Collin's use of /t/ in his writing sample. I commented that I thought he just put it onto the end of the word "brush" because he wasn't sure of how to spell the word. I suggested that he just wanted to be sure the word was correct and had not as yet learnt the suffix "ed". Mrs C agreed. We asked his teacher for a look at his class writing book and found he was mostly using the letter "t" correctly. I decided that it should not be included in his SPP content for this reason.

Once Mrs C started lessons with Collin, she remarked to me, "Collin is a quick learner. He picks things up quickly but I kept reminding him each lesson of what he has already done. Just to keep him on track. He seems to know the answers before I ask the questions!" Mrs C said that after a while she needed to change the games and equipment regularly to keep Collin's interest and motivation going throughout the program. Collin's teacher mentioned that she found Collin occasionally self-correcting during lessons, particularly during writing activities. She was pleased to catch him really thinking about the pronunciation of words, as this action demonstrated real progress for Collin. At the end of the SPP Collin completed the DEAP assessment and wrote a dictation passage.

Collin had made progress throughout the SPP with which all stakeholders were pleased. His mother boasted that when she asked Collin to stop and repeat the word "bear", as he had said "pear", that he just repeated the word correctly and didn't complain. Collin's teacher noticed that Collin had greatly improved his use of "th" and that he was really thinking about his use of sounds. Mrs C was amazed at how far Collin had come with his articulation and

felt that his use of /θ/, which was substituted with /f/ in the initial position when pronouncing the word “three” in the final DEAP assessment, was just a slip-up. She commented that Collin was probably just pronouncing words too quickly and wanted to get through the assessment as soon as possible rather than really thinking about what he was saying. Either way it was evident that Collin had made considerable progress during the SPP.

Dayana. Dayana was seven years and five months of age at the time of the study. She was enrolled in a Year One/Two composite class, where she was in Year Two. She spoke English at home and came from an Indigenous heritage. Her mother was an Australian Aboriginal and her father was a New Zealand Maori. Dayana lived with her mother and did not have contact with her father. Dayana’s mother was part of the Kamilaroi people. Their country is approximately 450 kilometres to the northwest of Sydney in New South Wales (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2018). Dayana does not know how to speak Kamilaroi but has grown up within the community.

Dayana’s mother said that, although Dayana didn’t know all her alphabet sounds, she didn’t think that this affected her learning. She also said that she didn’t think that Dayana’s pronunciation had been affected by her or her family’s use of Kamilaroi. Dayana’s class teacher commented that Dayana knew her alphabet sounds but seemed unsure of when to use them both verbally and in writing. She commented:

Dayana is an average student who doesn’t always know which sound to use in her writing and when talking to the class. She tries to cover this with a coy giggle, or sometimes she just admits she is unsure of what she is doing.

Dayana’s initial DEAP assessment exposed similar sound substitutions and omissions that could have been the sounds to which Dayana’s teacher was referring. Dayana’s initial writing sample showed six unusual spellings involving consonants: “grafaf” for “giraffe”,

“farari” for feather, “sekc” for “sink”, “frish” for “fridge” and “busht” for the word “brushed”. I considered each word carefully and discussed the spellings with Mrs C. For example, I realised that the word “giraffe” had the letters “af” repeated, indicating that Dayana had forgotten where she was up to and repeated “af” as a result of her confusion. She also neglected to include the letter “n” in the word “sink” and was unsure as to how to write /dʒ/ in the word “fridge”, writing the /f/ sound instead. She was similarly unsure of how to write “th” in the word “feather”, writing “r” as a substitute, and was uncertain of “ed” and wrote “t” in its place in the word “brushed”. Mrs C agreed that Dayana was insecure about her writing and seemed to make unusual decisions. I suggested to Mrs C that Dayana was concerned about writing as /dʒ, d, ð/ because she didn’t know how to write them. I clarified that the purpose of the SPP was to teach pronunciation to children so that they could use it to assist with their literacy learning. I expanded on this by reassuring Mrs C that the role of the classroom teacher was to teach the spellings of the sounds (for example, /dʒ/ as “dge”, “ge” or “j”), while her role was to teach the articulation of sounds. I explained that I thought Dayana didn’t hear the sound /ŋ/ in the word “sink” and would probably need to learn it by rote. Based on this possibility, I expressed my concern about Dayana’s hearing to her mother who said that Dayana had had her hearing assessed about two years ago. She said she would have it checked once again, just to be sure.

Following consultation with Dayana’s classroom teacher and Mrs C, the /d/ sound was added to Dayana’s SPP content. The content became /ð, θ, f, d, b, p/. Mrs C supported this content selection and emphasised the complexity of what children need to know in order to write words using appropriate spelling. She went on to say, “Spelling is the hardest for children. There is always an exception to the rule.”

During the teaching of the SPP, Mrs C commented that Dayana tended to mimic or copy what she was saying, rather than taking the lead to demonstrate her knowledge. She was

concerned that Dayana was not gaining enough from the SPP. I encouraged her to have confidence in what she was teaching and to include the occasional revision sound to encourage Dayana's retention. Mrs C changed the games a little to ensure that Dayana was continually revising each lesson. At the end of the lesson sequence Dayana was pronouncing sounds clearly during revision.

Dayana's final DEAP assessment confirmed she had made gains in her pronunciation and in her writing. Dayana's class teacher noticed that she was saying /θ/ in words clearly and was really concentrating in order to do so. She elaborated on this by saying, "Dayana looks up to the left when she is saying a word like 'three', then clearly says the word. I've realised that she has been doing it since working with you. It is a great step forward for her."

Dayana's mother verified her success by telling us that Dayana had sneaked a book home because she wanted to show her how she could read and say all the words correctly. Dayana's mother explained that when they were reading the book together at home, they had been pronouncing "the" as "fee" and Dayana said that the sound /ð/ was used when reading at school, but /f/ when at home. Dayana's mother was pleased that we were discussing the phonetic differences in the languages and explaining them to her child. Dayana's mother was happy that Dayana was so proud of what she had learnt. She was pleased that Dayana knew the sounds were for words for learning at school and that it was okay to speak differently at home.

Eli. At the time of the study, Eli was a vibrant, energetic child who was five years and nine months old. He was in a kindergarten class and spoke English at home. Eli had a rich and diverse heritage. His grandparents came from four different backgrounds. His mother's mother was an Australian Aboriginal and his mother's father was Irish. Eli's father's father was Maori and was known to speak Maori at home. Eli's mother indicated that Eli was very used to his grandfather speaking two different languages. Eli's father's mother was French.

According to Eli's mother only his grandfather spoke an additional language at home. Eli didn't know how to speak Maori and had not expressed an interest in learning it. Eli's mother reported that Eli's Aboriginal grandmother had no contact with her Indigenous family and knew little about her heritage. She thought that Eli knew all his alphabet sounds but at times had difficulty pronouncing some sounds. She was not sure if this had any effect on his learning at school and supported programs that enhanced his learning. Eli's class teacher commented that he was a bright little boy who knew his sounds and was beginning to work on his blends. He was doing well in class, and like other children in kindergarten, was making some mistakes.

The sounds /ð, v, b, d/ became the content of the SPP for Eli's learning. Before focusing on the content of the SPP, Mrs C revised other sounds with him to ensure he was using them appropriately.

Mrs C said that she found Eli to be keen to learn and happy to work on whatever she required him to do. Mrs C observed that Eli occasionally confused /w/, an approximant (semi-vowel), and /ɹ/, an approximant. She gave Eli a word each week to work on these sounds even though they were not part of his SPP. Mrs C remarked,

When Eli struggles with sounds, he just pops /w/ into the word, which is really frustrating. I'm working with him on thinking about the sound he needs before saying it. He is also struggling to say /ð/, so we've been doing a /ð/ word each lesson.

I suggested that she should place the word she was using into the lesson games to reinforce his learning, and she agreed to add the words to the games for reinforcement.

At the conclusion of the SPP, Eli articulated all the sounds accurately in the DEAP assessment, and Eli's mother reported that Eli seemed to be thinking about the words before saying them and felt that this was a step forward for him.

Results of Iteration 2

At the end of the SPP teaching sequence for each student, following the same procedure as Iteration 1, I completed the DEAP assessment with each student. I collected the writing work samples, including the kindergarten children's word and letter samples. This information assisted in the evaluation of Iteration 2.

Comparison of the initial and final DEAP assessments in Iteration 2 (Table 18 in the Supplementary Material section), confirmed that 23 more target phonemes were articulated during the final DEAP assessment than the initial implementation (82% more target phonemes articulated). All the substitutions made in the final DEAP assessment were /f/ (Ann used it as a substitution on three occasions, and Collin and Dayana used it once), which is described as phonological feature of AAE.

Ann, Collin, and Dayana accurately articulated 16 target phonemes that had not been articulated accurately in the initial DEAP assessment (57% more articulated). Bree and Eli articulated all target phonemes accurately. Collin and Dayana articulated all of the target phonemes accurately except for /ð/, substituted with /f/ on one occasion for each student, one in the initial and the other in the medial positions. Ann accurately articulated /θ/ in the initial and final positions, which were substituted with /f/ in the initial DEAP assessment. However, she used /θ/ substituted with /f/ in the medial position twice in the final DEAP assessment. Ann accurately articulated /dʒ/ in the initial position and on one occasion /ð/ in the medial position. This demonstrated an improvement in the pronunciation of sounds in five articulations. Collin used /f/ substituted with /ð/ in the initial position, which was not evident

in his initial DEAP assessment. He did use /ð/ substituted with /d/ in the medial position in the initial DEAP assessment, and further consolidation of /ð/ may have resolved this discrepancy.

Once again, the feature that displayed the greatest resilience to intervention was where /ð/ was substituted with /f/. Future programming should allow a greater emphasis on /ð/. Having worked with many teachers during my career, I've come to realise that the sounds /ð/ and /θ/ are not taught specifically, as they are both written as "th". Together with other researchers (e.g. Karaka & Sonmez, 2011; Owen, 2018 July,; Saidi, 2017), I would argue that explicit teaching of the differences in the two sounds is vital for children learning SAE.

As indicated in relation to Iteration 1, from my experience I have noticed that children often write the way they speak, and to determine the effect the SPP had on the participants' writing, a dictation passage was collected both before and after each DEAP assessment in Iteration 2.

The dictation passage was the same passage: "Both the giraffe and the thin frog brushed their teeth with toothpaste and a feather over the sink near the fridge." The children's two passages (initial and final) were compared to determine if the SPP had influenced the children's writing. Two children, Ann and Eli, were in kindergarten (Term 3) and struggled with sentence structure and complex words. Both of these students were given the target sound and two words containing the target sound to write (Table 19 in the Supplementary Material section). All the other students were in Year One or Two and completed the dictation passage above.

Prior to the implementation of the SPP, four of the five children knew that /θ/ was represented as "th" in writing. One child, who was in kindergarten at the time, didn't learn to write /θ/ as "th" during the timeframe in which the SPP was taught. Three of the five students

learnt that /ð/ in the medial position was also written as “th”. One kindergarten child learnt that /v/ was written as “v”, while the other kindergarten student learned that /dʒ/ could be represented as “j” in writing.

The largest improvements were in writing /ð/ as “th”, and the kindergarten students’ learning of “j” and “v”. The SPP cannot fully claim these gains in writing, as the children’s class teachers were working with the students’ writing at the same time. It is, however, evident that children gained a greater understanding of the way phonemes are written during the timeframe of the SPP.

Final meeting with the teacher

Our final meeting involved an opportunity to appreciate the children’s achievement. We compared the initial and final DEAP assessments (Table 18 in the Supplementary Material section), and were extremely pleased to observe that all of the children had made substantial improvement in their articulation. The greatest improvement was from Collin, who had reduced the number of substitutions he made in the initial DEAP assessment by seven. Bree and Eli had articulated all the sounds accurately during the final DEAP assessment.

Although Mrs C and I would have liked the SPP to be a solution for all and to have removed all the substitutions children made in their articulation, we realised that this was unrealistic and that children do make occasional pronunciation approximations. Mrs C commented, “The SPP could be used for any child who requires pronunciation support, particularly when it is affecting their literacy learning. A short intervention program like this could make a big difference to a child’s achievement in the long term.” We were pleased with the children’s progress, convinced that the SPP had enhanced the children’s learning, and we thought that it could do the same for other children learning a second dialect.

Comparison of Iteration 1 and Iteration 2

Findings from Iteration 1 and Iteration 2 were similar. A comparison between the initial and final Iteration 1 DEAP assessments indicated that 22 more target phonemes were successfully articulated in the final DEAP assessment, while the comparison between the initial and final Iteration 2 DEAP assessments established a difference of 23 more target phonemes articulated appropriately. All substitutions were identified (based on previous research literature) as phonological features of AAE, except the following five articulations:

- /t/ substituted with /k/ initial position, in the final DEAP assessment in Iteration 1.
- /dʒ/ substituted with /g / final position, in the initial DEAP assessment in Iteration 1.
- /dʒ/ substituted with /d/ initial position, in the initial DEAP assessment in Iteration 1.
- /dʒ/ substituted with /d/ initial position, in the initial DEAP assessment in Iteration 2.
- /dʒ/ substituted with /tʃ/ final position, in the final DEAP assessment in Iteration 2.

Four of the five substitutions were for /dʒ/, which represents one of the sounds Indigenous children find challenging. The phoneme /θ/ was the sound in both iterations that had the largest number of substitutions and the greatest improvement. There were 14 fewer substitutions for /θ/ in the Iteration 1 post DEAP assessment and 13 fewer substitutions in Iteration 2 post DEAP assessment. This accounted for 27 out of the 47 overall substitutions. The phoneme /ð/ had the second largest number of substitutions, and demonstrated an overall improvement of 10 fewer substitutions, five in each iteration. The phoneme /dʒ/ had three fewer substitutions in both iterations. The phonemes /v/ and /b/ were both articulated accurately in the final Iteration 2 DEAP assessment, while /v/ substituted with /b/ remained in the Iteration 1 final DEAP assessment. The substitution of /d/ with /t/ also remained in the Iteration 1 final DEAP assessment, while /t/ substituted with /k/ was a substitution in the final Iteration 1 assessment that was articulated accurately in the initial Iteration 1 DEAP

assessment. Finally, /b/ substituted with /p/ was articulated accurately in the final DEAP assessments of both iterations. This analysis demonstrates that the SPP contributed to the improvement of the children's oral pronunciation in both iterations, and justified its implementation with an overall improvement of 22 (Iteration 1) and 23 (Iteration 2) articulations.

The writing dictation passages collected in Iteration 2 (Table 19 in the Supplementary Material section) indicated that three of the five participants learnt to write the sound /ð/ as “th” during the time the iteration was taught. One child in Iteration 1 wrote the sound /ð/ as “th” in the word “feather”. Three of the five participants at the culmination of Iteration 1 wrote /θ/ as “th” in their writing, while three children in Iteration 2 already knew how to write /θ/ and wrote the sound accurately in their dictation. One student in kindergarten learnt to write “j” for /dʒ/, while all participants in the six to eight years age group (children in Years One and Two) did not write /dʒ/ in the word “fridge” accurately. It is apparent that some of the sounds the children have learnt to articulate have transferred into children's writing development. This is particularly evident in the children's writing of the phonemes /θ/ and /ð/.

Focus-group discussion and feedback

The focus-group meeting at the end of Iteration 2 was organised using the same procedures as Iteration 1. Iteration 2 results, as set out above, were emailed to all focus-group participants and a meeting time organised based on the group participants' schedules. Participants were reminded about the discussion guidelines prior to the meeting. A copy of the DEAP initial and final assessment results of Iteration 2, comparison results from Iteration 1 and Iteration 2, the students' initial and final dictation samples, the DGPs, and the following discussion questions were all included in the invitation email:

1. Why was the iteration effective/not effective?
2. How can the SPP be altered/adjusted in order to improve its effectiveness for future implementation?
3. How do you think the SPP should be implemented in the future?
4. Do you have any suggestions to enhance the SPP or its implementation in the future?
5. Do you have anything you'd like to discuss?

As with Iteration 1, I approached Mrs C, who taught the iteration, and asked her if she would like to present a haptic technique and some of the children's work samples at the meeting. She already knew that the focus-group members had copies of the results. She agreed and joined the focus-group meeting. This time, all six members were able to attend: the three local members attended in person and the three off-site members attended via Skype.

To open the meeting, I ran through the guidelines for the meeting and highlighted the students' progress throughout the iteration. This was followed by Mrs C's experience working with the program. She explained that she had little experience working with this type of program in the past and had enjoyed teaching the program. She followed this with a demonstration of the haptic technique for /θ/ used in the SPP and showed some students' written work. She went on to say that all the children had enjoyed the program and benefited from the one-on-one learning experience:

I kept in touch with the student's class teacher and let them know what sounds we were working on. The children got a lot out of the program and they showed what they had learnt in the SPP when reading and writing in the classroom.

Her comment suggests that there was evidence that the children were transferring their oral knowledge from one setting or situation to another. Mrs C's comment was further reinforced by the writing sample analysis detailed in Table 19.

After Mrs C's demonstration of student work, I brought the focus group's attention back to the initial question: Did we, the focus group, think that the second iteration of the SPP had been effective? All members agreed that it had. They also agreed that the SPP had supported the learning of reading and writing. One of the focus group members said:

It's pretty easy to tell that the kids have improved. Carolyn has displayed it nicely for us. Look, I can see that "th", as in the word "feather", is hard for the kids (pointing to the initial results), and three of them used it correctly in their writing and got it right in the last DEAP test.

The focus group discussed the results of Iteration 2 and considered the comparison to Iteration 1 results. Collectively the members decided that the different timetable and teacher experience did not reduce the effectiveness of the SPP, as overall the results were similar. I was pleased to hear this, as the timetabling and overall restrictions at the beginning of the program for Iteration 2 were not as ideal as for Iteration 1, where children could have a lesson each day, rather than requiring two lessons a day (albeit at different times). The conversation moved naturally to how we could make something that was effective even better. One focus-group member recommended a greater focus on writing. This was discussed, and she realised that the children were already writing regularly within the program. Another member suggested working with all sounds, including vowels, which was taken as a positive recommendation for future programming. This was a particularly relevant suggestion as some Australian Indigenous languages do not have all the SAE vowels (Butcher, 2008). The focus-group members read through the DGPs and decided, using an informal vote (four for and two against), that it was necessary to alter DGP 13 (The

involvement of expert teachers who have extensive theoretical and practical knowledge of the teaching of SAE pronunciation, who understand and value Indigenous language and cultural practices and provide multiple levels of support is vital). The concern raised by the members of the focus group was that experienced teachers who have extensive theoretical knowledge about the program may not always be available to teach the program. Such a teacher was available in Iteration 1, but not in Iteration 2. Both teachers did an excellent job despite the differences in their knowledge and experience. As a focus-group member said:

No offence to Mrs C. She did a great job. Just the teacher needs to be trained each time the program is implemented and their job is to teach the program. They just need sufficient knowledge to be able to run the program the way it is written.

The focus group agreed that the teacher would require knowledge of the teaching process and the haptic techniques, and a practical knowledge of teaching SAE pronunciation to children. They emphasised the importance of the teacher being open to learning different techniques and flexible enough to provide an individualised program to each student. All focus-group members supported the statement already written in DGP 13 that states: “who understand and value Indigenous language and cultural practices”, but restructured the wording of DGP 13 to read:

The involvement of teachers who have an extensive practical knowledge of teaching SAE pronunciation, are flexible and open to teach different techniques and value Indigenous language and cultural practices is vital.

I asked the focus group, one by one, if they agreed with the new wording of DGP13; they were all in favour of the wording change. The focus group accepted that the other 12

DGPs were necessary, and they were content with the way they were worded. I asked them whether the teacher would be able to modify the SPP to meet the individual children's needs; they all considered that this needed to be done by someone with theoretical knowledge and understanding of second-dialect acquisition teaching and pedagogy.

Finally, I posed this question to the focus group: "If other teachers followed the DGPs, do you think the SPP could be used in a different school in another location?" All six participants acknowledged that with a clear knowledge of the haptic techniques, and if all 13 DGPs and the SPP were followed carefully, the program could be used effectively in other schools. To close the meeting, I thanked the focus-group members for their participation, valuable time, and insights throughout the process. The meeting duration was 42 minutes.

Refined draft guiding principles (DGPs)

Following the focus group's thorough discussion of the DGPs, they were retained with one alteration (as noted above, DGP 13 was altered to accommodate feedback from the group). The focus group decided that because a highly experienced teacher, who possessed the theoretical understandings behind the SPP, was not always available, the SPP could be implemented by a teacher who not only valued Indigenous language and cultural practices but had the practical knowledge of teaching SAE pronunciation, in the form of the haptic techniques, and was flexible enough to teach the SPP once it had been tailored to meet each child's individual needs.

Conclusion

Pre- and post-DEAP assessment results and review of the children's work-samples demonstrated that Iteration 2 had enriched children's learning. The final focus group discussion and feedback further substantiated these findings. The dictation passage, containing the target phonemes, provided evidence that some of the sounds the children have learnt to articulate have transferred into children's writing development. This is particularly evident in the children's writing of the phonemes /θ/ and /ð/.

These results were based on the 13 DGPs. On reflecting on the effectiveness of the DGPs the focus group was satisfied with DGPs 1-12, but expressed a need for a modified DGP 13 to provide for circumstances where a highly experienced teacher, who possess the theoretical understandings behind the SPP, is not available. DGP 13 enables a teacher who values Indigenous language and cultural practices, has practical knowledge of teaching SAE pronunciation in the form of haptic techniques, and is flexible enough to teach the SPP tailored to each individual child's needs. Further exploration of the findings in Iteration 1 and Iteration 2 are discussed below and reflected upon in Chapter 8.

Conclusion of Iteration 1 & 2

The DGPs supported the implementation of the SPP through both iterative cycles and enabled the program to have positive outcomes for all the participants. The children were encouraged throughout the program by a trained teacher, who guided the students' learning through targeted content that was relevant to their personal understandings. This ensured that they learnt the articulations through pedagogy that was both culturally relevant and enjoyable.

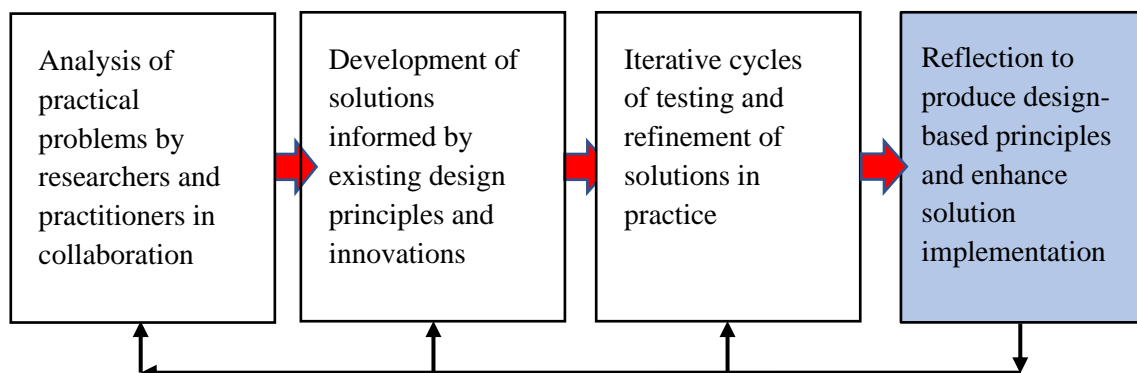
The haptic techniques ensured student engagement and supplied an avenue (the use of movement and touch) to help students remember how to articulate the sounds. These techniques are vital to the success of the program, and teacher training is required prior to the implementation of the SPP in any context.

This project's success was partially due to the support that I (the researcher) provided, as I have both theoretical and practical knowledge in the area of study as well as 28 years' teaching experience. This underlying knowledge assisted in the design, implementation, and assessment of the SPP. In Chapter 8, the necessity of having a teacher with theoretical and practical knowledge, who can work with the design, implementation, and assessment of future programs will be further discussed.

The learning experiences of this research project were successful due to the relevant content and pedagogy for the learners. This was combined with the sensitivity to other dialects of English, particularly Indigenous languages supported the second dialect learners. The DGPs not only ensured respect for the participants' cultural language and provided the opportunity for learners to be active participants in their own learning, but also provided appropriate pedagogical practices and lesson content for positive outcomes. Reflection on and discussion of the DGPs and the SPP will be continued in Chapter 8.

Chapter 8

Phase Four – Reflection and Discussion



Refinement of Problems, Solutions, Methods, and Design Principles

Note: Based on design-based research diagram by Reeves (2006, p. 109)

The study described in this thesis was motivated by my experience working with primary-school-aged Indigenous children and their teachers, which led me to ask what I could do to enhance Indigenous children's learning of SAE phonology. Some of my colleagues commented on the way the Indigenous children in their classes pronounced words and were concerned that they might need speech pathology to assist with their articulation. I wondered how I could go about assisting Indigenous students' use of oral language, and this idea became the motivation for this study. I required a methodology that provided a practical solution, was underpinned by theory and research, and could be used by colleagues teaching Indigenous students with similar learning needs. After considering a variety of methodologies, I decided upon design-based research (DBR) (Reeves, 2000; 2006), as it provided an avenue to develop a practical solution (the sociocultural phonological program, or SPP) and the opportunity to test out the solution in the form of cyclic iterations. These iterations resulted in the refinement of design-based principles (DBPs), which can be used by educators in a variety of contexts to support the literacy needs of Indigenous children. The

use of the DBR provided the means to solve a complex real-world problem, while maintaining a commitment to theory construction and explanation (Reeves et al., 2004).

The DBR approach (Reeves, 2006) used in the study enabled a staged process of design, and the testing of a solution (the SPP). The design process consisted of four phases over a period of five years, including two iterations where the DGPs were tested through the implementation of the SPP with two groups of primary-school-aged children who had been identified as struggling with both the articulation of SAE sounds and literacy. The school and community involved in the research were selected as a result of the relationship between the researcher and the local Aboriginal Education Consultative Group (AECG), as well as the relationships among the researcher, the school, and the NSW Department of Education. The AECG endorsed and welcomed the study at a local meeting, and in writing, prior to the commencement of the research.

In this chapter, I reflect on the DBR research described in this thesis to: 1) consider whether the SPP produced the expected outcome of an improvement in children's phoneme pronunciation and literacy through the teaching of a phonological-based program informed by sociocultural learning theory; 2) identify the contextual factors likely to affect the design and implementation of the solution (the SPP) in the future; and 3) produce the final design-based principles (DBPs).

Did the research produce the expected outcomes?

As outlined by Zuiker et al. (2016, p. 16), the success of DBR can be determined through four questions: 1) Does it work?; 2) How well does it work?; 3) Why does it work in these real-world conditions?; and 4) How can theory be developed through the research?

These questions become the criteria for success.

Does it work and how well does it work?

The students' DEAP results for Iterations 1 and 2 and the anecdotal comments from their classroom teachers and the SPP teachers suggest that the program was successful in improving the participating children's phoneme articulation. At the end of Iteration 1, the children articulated 22 (71%) more target phonemes during the DEAP assessment, and 23 (82%) more were articulated at the end of Iteration 2. Three of the 10 participants had zero approximations in their final DEAP assessment. These results suggest that the SPP supported improvements in the children's phoneme articulation.

The classroom teachers' observations and the written work samples suggest that the children were able to transfer their phonological learning during the SPP to the classroom. For example, Bree's class teacher commented, "She seems to self-correct. She puts her hand in front of her face and then seems to practise the way the sound is pronounced. I've noticed it when she is reading and when she is making sentences." And Collin's teacher said, "He just stops, rethinks, and reads on. I'm amazed at his ability to know he needs to fix it." These comments also indicate that these students were developing their ability to notice and self-correct without the assistance of the teacher, suggesting an increased awareness of the sound and ability to notice the difference between their personal production of the sound and the target production. However, it is difficult to ascertain exactly how much transference can be attributed to the SPP, as some children may have been supported at home with their articulation and class teachers were also teaching literacy, including reading and writing, at the same time as the iterations were taught. Nonetheless, students choosing to use the haptic gestures during regular class time suggest that there was at least some transference from the SPP instruction. The analysis of data collected from the initial and final DEAP assessments and the writing samples collected during each iteration indicate that there had been some transference from oral to written production.

In Iteration 1, there were 11 possible pronunciations that may have transferred to children's writing. Transference was evident when Amy wrote the word "teeth" with "th" rather than "f", which was problematic in the initial DEAP assessment but not in the final DEAP assessment. Brian wrote /dʒ/ correctly in the word "fridge" and pronounced it without an approximation in the final DEAP assessment, while in the initial DEAP assessment he used an approximation in the final position. Both of these two examples demonstrate possible articulations that may have affected the children's writing.

Transference was slightly more observable in Iteration 2. The data analysis was facilitated due to the writing samples that were collected both before and after the SPP had been taught. Five articulations that were approximations in the initial DEAP assessment were written appropriately in the final sample of writing. Three participants learnt to write /ð/ as "th". Eli consolidated his ability to write "v" with correct placement, and Ann (child in kindergarten) learnt that /dʒ/ could be written as "j". All of these written adaptations, in both iterations, could be interpreted as a response to the participants' enhanced understanding of pronunciation following their participation in the SPP.

One of the key commitments from the very beginning of the research was that of supporting the individual learning needs of each child. This was addressed systematically through a number of strategies, the most important of which was the design of individualised versions of the SPP to match each child's personal articulation needs. This was achieved by using the results of the DEAP assessment completed at the commencement of each iteration to identify a list of consonant sounds that each individual child either omitted or pronounced as approximations, and to provide information about where in the word the child had difficulty articulating the sound. The children's consonantal needs could be programmed into their own personal SPP without the constraint of time or timetabling. The duration of each child's SPP varied according to their consonantal needs and was adjusted throughout the

program to allow for their personal needs. For example, if a child was struggling with a particular sound, the articulation of the sound was revised regularly, using the haptic techniques. The teacher also ensured that it was frequently revised through games and other activities, until the child demonstrated accuracy on several different occasions. Other measures included children choosing texts and writing media. This selection allowed for children's individual differences and encouraged engagement.

Further indicators of success were evident through the evaluative discussions held during focus group meetings, particularly during the final meeting concluding Iteration 2, endorsement provided by the school executive team, and continuation of the program within the school.

Why does it work in these real-world conditions?

As Bakker and van Eerde (2015) point out, "interventionist research" in the DBR tradition derives what they describe as its "ecological validity" from the implementation of interventions, in this case the SPP, in natural settings. They argue this is a particular strength of DBR research because it provides the means to assess learning that is already taking "place in 'learning ecologies' as they occur in schools and thus the methods utilised measure better what researchers want to measure, that is learning in natural situations" (p. 14). In my study, children's phonological articulations were assessed, along with writing samples, to determine if children had improved both their phonological pronunciation and their literacy, in the "real life" context of the classroom (school environment).

In the context of my study, validity was further enhanced by the DBR processes, which encourage collaborations and ongoing reviews involving with practitioners and other key stakeholders. In my study, the preparations and outcomes for each phase were reviewed by a variety of people: the focus group, the SPP teacher and myself (the researcher), as well

as my three supervisors, who followed each phase closely and commented on my interpretations. A teacher colleague external to the study provided critical assessment of each of the DBR phases. She and I met regularly; she perused the documents and had access to all video footage, the data from the DEAP assessments, and the work samples. At the conclusion of each step within the research (e.g., completion of semi-structured interviews), she provided me with her appraisal of the process. This allowed adjustments to be made throughout the research. The focus group also gave suggestions and provided constructive feedback to guide the research through to its conclusion. This adaptability of the program to the context and children's needs strengthened the research by providing a dynamic context that promoted the children's learning. As confirmed by research (Bakker & van Eerde, 2015; Rodriguez, 2017), adaptability to the context is a strength rather than a limitation, as might be the case in other forms of intervention research.

Adaptability to the context. While the DBPs provide knowledge, theory, and procedures that can be applied to other contexts, the implementation of the SPP pointed to contextual possibilities and constraints that would influence the implementation of the solution in different settings or contexts. I would argue that it is when these practical factors are addressed in new contexts and coupled with the DBPs that Indigenous children have the greatest opportunity to learn SAE consonant articulation.

Indigenous children's education has been affected by the impact of governmental policies and political influences throughout history. Many Indigenous adults have not had a formal education, as most Aboriginal children were not allowed to attend school until 1972 (Harris, 1976). This has had an impact on Indigenous children, as many adults cannot assist their children or grandchildren with schoolwork. Also due to similar governmental policies, many Indigenous people have been forced into situations where they no longer live with their families and have few material resources. This has given rise to intergenerational

disadvantage (Gray & Beresford, 2008) that can impede educational progress through children living in other situations such as out-of-home care (OOHC), absenteeism, and low socio-economic status.

Indigenous children are overrepresented in OOHC, which several studies suggest (Jurczynszyn & Tilbury, 2012; Trout et al., 2008) directly affects their educational outcomes. The factors that support children having positive experiences in care include having strong personal motivation and resilience, a close, supportive adult, stability in care and school placements that support school attendance, and sufficient financial support (Mendes et al., 2014). Children in OOHC also require ongoing emotional support and encouragement from all the adults around them. Other supports involve early intervention and ongoing specialised individualised learning programs (Cameron et al., 2012; Jurczynszyn & Tilbury, 2012; Mendes et al., 2014). Research indicates that children in OOHC can have positive educational outcomes with a high level of support (Cashmore et al., 2007; Jackson & Ajayi, 2007; Jurczynszyn & Tilbury, 2012).

My research specifically addresses many of these issues. It provides DBPs for the design of individualised early-intervention programs in an area of oral language and phonemic awareness that has been linked to Indigenous children's literacy needs. The program can support children who are transient during OOHC placements. The program provides the opportunity for an ongoing connection, for the duration of the program at least, with a caring, responsible adult. This connection could endure for longer depending on the individual child's situation. For example, as a teacher in their school, I have continued to provide emotional and learning support for some of the children who participated in the study. We seem to have developed a bond, and although I am no longer directly involved in their learning in the school classroom, they talk to me in passing or seek me out to help them with some of their learning. This helps them value learning and become more resilient

learners. Some children may not have a willing parent to support them at home and my relationship with them assists their personal learning experience. Children in this study also came from low socio-economic backgrounds, and this can be challenging for students.

Low socio-economic status and the effects of family characteristic have a significant impact on educational outcomes (Jones, 2008; Martens et al., 2014; Vinson et al., 2015). The SPP was designed to require minimal resources, and for this reason is ideal for implementation in schools where the majority of the population comes from a low socio-economic background. The program does, however, require an experienced teacher to teach the lessons. Naturally, the greater the number of students involved in the program, the greater the time that needs to be allocated to teaching it. However, the program could be adapted for small groups or class groups, depending on the need.

Absenteeism can slow learning down and be difficult to address. A student cannot be taught if they are not at school. According to Peacock (1993), children realise at a very early age that Aboriginal society is very much family-oriented, with the emphasis placed heavily on the extended family and the complex kinship system. Indigenous parenting and family life can at times encourage children to stay at home rather than go to school (Taylor, 2010). Indigenous children's values taught in the home environment are often incompatible with those taught within the school system (Burbank, 2006). What are considered to be good reasons for Indigenous children's absenteeism may not necessarily be the "right reasons" according to the dominant society (Christie, 1988).

However, attendance is a determinant of academic success. Comparisons between Indigenous and non-Indigenous children's academic progress demonstrates that Indigenous students have lower academic outcomes if they miss a large amount of schooling than if they do not (Biddle, 2014). Educators can do little to address the underlying causes of non-attendance, but they can provide support programs that address specific areas of need. This is

exactly what this project was designed to do. Non-attendance was addressed in the implementation of the SPP by the use of creative timetabling that allowed the SPP teachers to work with those children who were at school on a given day and catch up on lessons with the absent children on days when they were in attendance. Attendance, however, can be related to the child's and/or their family's attitudes and emotions.

Emotions can play a role in second language/dialect acquisition. There is research that both highlights the importance of motivation on change (Pintrich, Marx, & Boyle, 1993) and research that emphasises the role of motivation on cognition (Oxford, 2016). However, there is growing research in positive psychology (Baker, 2021; Gabry's-Barker & Gatajda, 2016; MacIntyre, Gregersen, & Mercer, 2014) that supports the role of positive emotions in second language acquisition. Most scholars in the field of second language learning (Dörnyei, 2005; Imai, 2010; Lopez, 2011; MacIntyre, MacKinnon, & Clement, 2009; MacIntyre & Vincze, 2017) assert that second language learning is emotionally driven. Lopez (2011) argues that nurturing emotions can help to overcome problems of demotivation created by fear or anger which can potentially endanger second language learning. She further asserts that evoking emotions enhances learners' self-esteem and empathy which, in turn, greatly contributes to learners' attitudes and motivation, thereby facilitating language learning. Imai (2010) substantiates this by indicating that emotions facilitate, filter or hinder an individual's inner cognitive functioning, they can mediate development, when learning is based on interpersonal interaction. MacIntyre (2002, p. 45) suggests that emotions "just might be the fundamental basis of motivation". Higher levels of emotional intelligence are also thought to affect language achievement (Lopez, 2011; Pishghadam, 2009). Emotional intelligence is defined by Goleman (1995, p. 28) as "abilities that include self-control, zeal, persistence and the ability to motivate oneself". Attitudes toward second language learning and motivation have shown to influence second language achievement (Dörnyei & Kubanyiova, 2014;

Hadfield & Dörnyei, 2013). These attitudes are multifaceted and affected by a variety of variables but positive attitudes and motivation can produce successful language learners (Dörnyei & Kubanyiova, 2014; Gardner, 1985; MacIntyre & Charos, 1996; Rahimi & Yadollahi, 2011). The lessons within this study provided motivational, enjoyable activities such as games, sensory activities and sensory awareness activities involving teacher interaction. These activities although concentrating on the content of the lesson provided fun activities to motivate and encourage learning in a social supportive environment. Interactions with children provided a supportive environment where they were valued and accepted. Skutnabb-Kangas (1988) observed that when a child's home language is valued in the educational setting, it leads to low anxiety high motivation and high self-confidence. Three factors that are closely related to successful educational programs. Scull and Lo Bianco (2008) emphasised that the connections children make with the teacher and the school when they are involved in a nurturing and accepting environment encourages communication and respect. Children are motivated to achieve and they know that their teacher will support them in their learning. Supportive teachers better understand their students through an awareness or understanding of each child's background (Australian Institute of Teaching and School Leadership [AITSL], 2017).

Being aware of the background and situation of each individual Indigenous student assists in providing appropriate learning. This can be a challenge for any teacher, but research (Jurczynszyn & Tilbury, 2012; Mendes et al., 2014; Preston et al., 2017) indicates that positive attitudes and beliefs shown by significant adults, which teachers are, can have a dramatic effect on helping Indigenous children attain higher learning outcomes. Moreover, opportunities for Indigenous children to be involved in the decision-making process regarding their learning enables them to have ownership of their learning and future directions (Cameron et al., 2012). Throughout the implementation of the research, individual

children's circumstances were considered and provision was made for them to extend their learning when they were able. The teacher remained the same throughout each child's SPP, which allowed the teacher to get to know the student and build a relationship that fostered learning. Children were able to select some of the games or books to be read. This involved them in the decision-making process and allowed them to have ownership of their own learning. This practice evolved through the teacher's preparedness to be flexible and adapt the program where necessary to accommodate the children's needs. The teacher's experience enabled her to understand that the specific game or book didn't matter, but the content within the book or game was important.

A number of studies have shown that many teachers in Australia do not know that many Indigenous people speak a dialect of English other than SAE (Disbrays, 2016; McTaggart, 2010). McTaggart (2010) attributes this lack of knowledge to insufficient training. Teachers are often unaware of Australian Aboriginal dialects and have not recognised the issue or been trained to respond to it with changes in their teaching. A study by Oliver et al. (2011) regarding teacher awareness and understanding of Aboriginal English in Western Australia revealed that teachers' attitudes and understanding about Aboriginal English varied considerably, from "ignorance" through to "strong understanding". Rural teachers were more confident in the use of Aboriginal English in the classroom. Few of the teachers in the study referred to code-switching or accurately described Aboriginal English. Where teachers had participated in professional development on Aboriginal English, there was an improved acceptance of Aboriginal English and a greater knowledge of the dialects themselves. These findings, and others like them (Kitchen et al., 2009; Moreton-Robinson et al., 2012; Peltier, 2010; Sharifian, 2008), point to the need for teacher professional development about AAE, including the differences between AAE and SAE, particularly phonology and appropriate pedagogies to teach phonology. It is clearly evident that

professional development is one of the critical elements that can foster students' academic success (Guskey, 2002; Lumpe et al., 2014; Opfer & Pedder, 2011; Tetley & Jones, 2014).

The experience and training of the teachers involved in teaching the iterations was a crucial factor in the students' learning outcomes. They were already sensitive to some of the children's personal backgrounds and first dialects due to their roles within the school. The teachers understood that non-attendance was likely a factor they needed to take into account, and flexibly changed lessons to accommodate. I further prepared the teachers for the contextual and background factors pertaining to each student through the information shared with me from the parent/carer interviews, the school, and informal relevant conversations we may have had with carers before the SPP implementation. This information provided background information to help teachers make provisions for the students' individual differences and provided evidence to encourage them to be flexible in their program delivery. The teachers in this study developed a rapport with the students and provided an environment in which each child could learn.

I trained the teachers to understand the phonological differences (consonants) between AAE and SAE, the Indigenous pedagogy that underpins the program, particularly Scull's principles (2016) and Yunkaporta's (2009) Eight Ways of Learning, and the DEAP assessment provided further information about the students' needs and program content knowledge. I taught the teachers to teach the haptic techniques and to use other pedagogy within the programs. I informed them of the content for each student, wrote individualised programs for the teachers to use, and supported teachers in the implementation of the programs. I wrote detailed notes and PowerPoint slides of this training. Evidence of the success of this training is manifested in the success of both iterations.

For the application of the DBPs in the form of a program (SPP or similar) to be implemented on a wider scale or in other contexts, a person like myself, with an in-depth knowledge and experience in the content and pedagogy, including the haptic techniques, would be needed to ensure that the teachers are trained and all the DBPs are addressed.

Contextual factors are embedded in the DBPs. DBP 1 ensures that the program is delivered by a supportive adult, and DBP 8 makes provision for individual programs that are adapted to the needs of each student, including flexible timetabling and delivery. All physical resources necessary for program delivery are usually within the school environment, and if not, they are inexpensive and easily acquired. This is not a DBP, but is suggested by DBP 3, and ensures that the program is accessible to all students.

How can theory be developed through the research?

One of the main strengths of a DBR approach and what differentiates it from other approaches is that it enables the researcher to work on a problem using existing theory and current knowledge to produce a solution that is innovative and useful (Bakker & van Eerde, 2015). The Phases of DBR provide the means to intervene (e.g. manipulate the conditions of teaching and learning) according to theoretical ideas to improve an outcome or outcomes (e.g. Indigenous children's phonological learning and chances of school success). These theoretical ideas are formalised at the end of the research in the form of DBPs, arrived at through a process of iterative refinements.

The thoroughness with which current theory and knowledge are identified in the first phase of the approach is crucial to the entire success of the project. In this study, two main sources of knowledge – the literature review and the interviews with educational experts and Indigenous Elders – were accessed to determine the literacy and learning needs of Indigenous children and the best ways to support and address them. The first of these was the scholarly

literature on the relationship between first language and personal identity; first- and second-dialect/language acquisition; children's phonological development; SAE and AAE phonological differences; and pedagogical practices, both Indigenous and non-Indigenous, to support second-dialect acquisition. The second was expert advice from relevant educational practitioners working in the areas of primary education, Indigenous education, English as a second and other language education, speech pathology, and applied linguistics, as well as from community Elders, obtained through semi-structured interviews.

A review of current theory on language learning reinforced the value of Vygotskian sociocultural theory (1962) as a means to support the development of the SPP, and it thus became the theoretical foundation for its design. Learning took place in a social environment, with a more experienced mentor, in the ZPD. The learning was scaffolded within the SPP to ensure similar phonemes were taught together and differences between languages acknowledged and Indigenous languages respected. Phoneme acquisition was scaffolded to encourage optimum learning. From the literature on Indigenous ways of learning, I concluded that any program involving Indigenous children needed to be developed around opportunities for the children to interact with others and gain support from those who valued their first dialect, especially in contexts where they may be striving to learn a dialect different from that of their community or from their first dialect.

Research on the phonological differences between SAE and AAE (Butcher, 2008; Eades, 1993, 2013; Eagleson, 1982; Kaldor & Malcolm, 1979, 1982, 1991; Sharpe, 1977; Toohill et al., 2012; Williams, 2000) narrowed the expected needs of young Indigenous learners to the obstruent group of sounds, particularly fricatives, pointing to potential content for the SPP intervention. However, Indigenous children come from a variety of backgrounds; this not only makes each learner unique, but also, in the case of this study, made each child's focus consonant needs unique (Moyer, 1999). If the program were to meet the needs of all the

participating children, it would need to include an oral phonological assessment that ensured that individual students' articulation learning needs were accommodated. The DEAP assessment (Dodd et al., 2002) was chosen, as it is norm-referenced to the Australian population.

An investigation of scholarship on Indigenous pedagogies produced guidance on culturally appropriate ways to teach children SAE. As reiterated throughout this thesis, a particular focus was to ensure that each child's first dialect was valued and respected. I would argue that this was a particularly important aspect of the intervention. From a personal perspective, having observed my father over many years, I understand how a person's first language expresses who they are; it forms part of their personal identity. For this reason, it was vital that the children's first language was explicitly valued (Sharifian, 2008; Williams, 2011), and that the children and their parents were aware that the SPP teachers were sensitive to the potential differences between dialects and would communicate this to the children they were teaching.

Scholarship on Indigenous pedagogy (Lloyd et al., 2015; Osborne, 1996; Scull, 2016; Yunkaporta, 2009) points to the importance of images to support children's understanding, narratives to enhance learning, and opportunities for the children to make some choices in their learning. Like other children their age, Indigenous children learn from the teacher modelling the pronunciation of sounds, and have a variety of opportunities to practise the skill or strategy taught (Wray, 2010; Yunkaporta, 2009). In relation to the kind of teacher required to implement such pedagogy, Scull (2016) developed six pedagogical principles for early literacy learning for Indigenous children. Her research highlighted the importance of expert teaching, provided by teachers who have an extensive knowledge of and experience in teaching the pronunciation of SAE sounds and who value Indigenous culture, language, and practices.

Eleven DGPs created from my analysis of the literature were used to inform the design of the semi-structured interviews conducted with the educational practitioners. Depending on their particular areas of expertise and interests, the practitioners emphasised the importance of fun sensory activities focusing on sounds, with one particularly emphasising the value of making the association between gesture and articulation through anchoring vocabulary with enjoyable haptic pronunciation teaching techniques. The positive impact of haptic (gesture and touch) techniques on teaching second languages is reinforced in the literature (Acton et al., 2013; Burri et al., 2016; Mister-Colmenares et al., 2020; Teaman & Acton, 2013). Consultation with my supervisor, Dr Amanda Baker, assisted in my understanding of this process. She trained me in gestural/tactile techniques for focus consonants along with links to resources that support these techniques. This method of teaching consonants became DGP 13.

DGP 13: Modelling sounds using a haptic approach makes learning fun and enhances retention in both short-term and long-term memory.

The interviewees suggested Indigenous practices that were consistent with Yunkaporta's (2009) modelling and scaffolding of learning, working from wholes to parts and watching or demonstrating before doing as most effective. Their comments resulted in DGP 10 being split into two DGPs (10 and 11).

DGP 10: Indigenous children should be taught in a manner that uses the senses to support understanding, uses narratives to enhance learning and suits their learning preferences.

DGP 11: Indigenous children should be taught using the process of modelling/demonstration, joint and/or supported activities and individual activities where learning works from wholes to parts.

This refinement of the 11 DGPs, through the addition of two DGPs, clarified some of the pedagogy to be applied in the SPP design. These 13 DGPs became the basis of the SPP design.

The cyclic testing of the solution in the form of Iterations 1 and 2 identified the need for further refinement of the DGPs. During the two iterations of the implementation of the SPP, I became more aware, from my own observations and the teachers' comments, of how little time teachers had to learn the pedagogy, particularly the haptic techniques, of the lessons we had planned, or to consult with someone who could assist them. This conclusion was reinforced by the focus group's review of the processes for preparing the teachers to implement the SPP. While there could be many reasons for this, such as limited funding, the school context, or simply the fact that teachers usually try to give most of their time to interacting with their students, I decided in consultation with the focus group, that the teachers' capacity and preparedness were integral to the success of the program. As a result, DGP 14 was added to the list to ensure that teachers were supported in creating the program and fully aware of the pedagogy before teaching it.

DGP 14: Teachers are provided with sufficient support, time and resources to tailor the sociocultural phonological program (SPP) to the context, particularly the needs of the learner, and are upskilled in the SPP pedagogy and content, to enable effective teaching of the program.

In keeping with Phase 4 of the DBR approach (Reeves, 2006), the 14 DGPs now became the final design-based principles developed from this research. As Herrington et al. (2007) emphasise, DBPs "contain substantive and procedural knowledge" (p. 7) and are "evidence-based heuristics that can inform future development and implementation decisions" (p. 7). The SPP is the solution to the gap that was revealed through the literature in the first phase of the project. DGPs were developed through interviews with educational experts including community Elders and further literature. The SPP was built on the foundation of the DGPs, and these principles were refined with each iteration of the SPP. The DBPs that have evolved can now be applied to other contexts and to the development of similar programs. The DBPs are as follows:

DBP 1: Language is learned from interaction with a more experienced person in a social context.

DBP 2: Using metalanguage while in the ZPD will enhance language learning.

DBP 3: Use of language play is a preferred approach for successful language acquisition.

DBP 4: Scaffolding of learning and communication is a useful strategy to build capacity.

DBP 5: Sounds that are similar in the child's first and second dialects should be explicitly taught together.

DBP 6: Blending and segmenting sounds, along with placing sounds in context, should be used in the process of teaching.

DBP 7: Phonological differences between AAE and SAE should be used to guide learning.

DBP 8: Assessment highlights relevant learning and assists in the development of program design that builds on students' prior knowledge.

DBP 9: Ongoing affirmation and valuing of a child's first language is crucial.

DBP 10: Indigenous children should be taught in a manner that uses the senses to support understanding, uses narratives to enhance learning and suits their learning preferences.

DBP 11: Indigenous children should be taught using the process of modelling/demonstration, joint and/or supported activities and individual activities where learning works from wholes to parts.

DBP 12: Modelling sounds using a haptic approach makes learning fun and enhances retention in both short-term and long-term memory.

DBP 13: The involvement of teachers who have extensive practical knowledge of the teaching of SAE pronunciation, who are flexible and open to teach different techniques and value Indigenous language and cultural practices is vital.

DGP 14: Teachers are provided with sufficient support, time and resources to tailor the sociocultural phonological program (SPP) to the context, particularly the needs of the learner, and are upskilled in the DBP, to enable effective teaching of the program.

Limitations

Limitations within DBR surround the scope of the research, the role of the researcher (as mentioned above) and the transferability of the findings. The scope of the research is dependent on the researcher's coordination of the phases or steps within the research and the quantity of data. I coordinated the study, ensuring that each step and phase was carried out in the right sequence and in the appropriate manner. Data was collected during each step of the study; interviews were transcribed and both work samples and the DEAP assessments (initial and final) were analysed in order to measure the children's progress within each iteration. Other data in the form of video recordings and photographs were collected to ensure the process was transparent. This data was discussed and evaluated at focus group meetings, and with another class teacher independent of the study, in order to provide validity. An external educator considered each step of the research, in order to provide feedback that was not biased in any way. The purpose of this research was to develop underlying principles for a sociocultural program that could support Indigenous children's understanding and acquisition of second-dialect consonant sounds and literacy in the early years of schooling. Fifteen educational experts and Indigenous Elders were interviewed and literature reviewed in order to develop the SPP. Two iterative cycles involving ten children (five per cycle) were undertaken to refine the SPP. Contextual factors, such as absenteeism, were addressed and six focus group members evaluated the results of the two iterative cycles. This research took place in a medium-sized semi-rural school on the outskirts of Sydney. The small sample size does place some limitations on the data which is minimised by the rich in-depth data collection and analysis.

The thick description and rich data collection and analysis was conducted by myself and checked by a class teacher. This process provides data transparency and reliability. I (the researcher) coordinated the research, conducted the semi-structured interviews, trained the

teachers who were to teach the iterative cycles of implementation, created the SPP and assessed the student participants using the DEAP assessment tool. I had used this tool previously to assess 42 children in a study leading up to this research. My role was multifaceted; however, validity was maintained by allowing an educational expert to observe my work and I utilised the focus group to peruse the analysis and findings during meetings.

The thick description collected during the research provided a robust and detailed account of the experiences throughout all the phases of data collection. It gave a detailed account of the research and provides helpful information for future researchers to make transferability judgements themselves. Thereby encouraging transferability. Even though the sample size is small, the transferability of the findings from this research is solidified through the wealth of knowledge and thick description that is provided from each of the iterations. The final 14 DBPs developed throughout this research are transferable to other contexts and provide the foundation of future programs to support young Indigenous children's acquisition of SAE sounds. Chapter 9 further considers the contribution to theory and future directions.

Chapter 9

Phase Four – Contributions and Future Directions

As explained in Chapter 3, the design-based research (DBR) approach can be traced back to the “design experiments” or “design research” carried out by Ann Brown (1992) and Alan Collins (1992). These scholars developed an approach to research that enabled them to transform learning in classrooms by engineering, “innovative educational environments and simultaneously conduct experimental studies of those innovations” (Brown, 1992, p. 141). Their ideas were applied and further developed by educational researchers, particularly in the area of instructional design, as a way of testing and refining educational designs based on theoretical principles derived from previous research (Collins et al., 2004). DBR has been used increasingly in educational contexts (Cotton et al., 2009; Eady, 2010; Lin et al., 2014) and, according to Anderson and Shattuck (2012), the use of DBR is particularly attractive for use in school environments with technological interventions. Few researchers have used DBR in second-dialect acquisition research. This in itself adds to DBR theory and practice. My research contributes to the development of DBR theory, as I used this cyclic process of designing a solution, evaluating its implementation, and modifying the solution to develop a set of design-based principles (DBPs) for the development and implementation of a phonological program for Indigenous children. The sociocultural phonological program (SPP) was designed based on theoretical and practical principles gained from the literature, and from consultation with Indigenous and non-Indigenous educational experts in the field. In this way, the SPP was systematically engineered to generate evidence-based claims about the learning that was taking place (Barab & Squire, 2004); in the case of my study, the learning of SAE as a second dialect.

Through the production of the DGPs and the final DBPs, I argue that, as Cobb et al. (2003, p. 9) propose, this design experiment went beyond the empirical tuning of “what works” to contribute to the development of theory. At the same time, as Collins et al. (2004) argue, the results of the DBR approach are also intended to refine practice through its advancement of theory.

In this chapter, I argue for the advancement of theory in DBR through its application to research in the field of second-dialect acquisition. I also argue that in addressing the question of how best to support Indigenous children’s understanding and acquisition of second-dialect consonant sounds, I develop the argument that my study makes an important contribution to second-dialect acquisition theory and practice in relation to three main areas: making choices of phonological content for young Indigenous learners; the acknowledgement and valuing of identity; and second-dialect phonological pedagogy.

Contribution to second-dialect acquisition theory and practice

Throughout my 28 years of teaching experience, I have observed first-hand the frustrations of parents and their children when endeavouring to learn a second dialect, just as I was extremely frustrated when I, as a child, tried to explain to my grandmother that I had a new pair of tights, simply because I did not have the word, in her language, she needed for us to communicate (as explained in Chapter 1). Children often feel this way when they do not have the sounds, nor the way to pronounce the sounds, to articulate what they need to say (Gould, 2008).

Without this need being addressed, children are likely to have only limited success with their schooling (Zubrick et al., 2006). However, the relationship between first and second dialects is complex for children to learn (Tagliamonte & Molfenter, 2007). As discussed in Chapter 2, a variety of programs designed to teach phonological awareness and SAE to Indigenous children have been implemented in Australia (Abrami et al., 2019;

Cowey, 2005; Malcolm, 1995; Wheldall & Beaman, 1999; Yonovitz & Yonovitz, 2000).

While these programs have concentrated on enhancing literacy, they have had minimal focus on oral pronunciation. As considered in Chapter 2, oral proficiency and phonological skills influence children's reading and spelling development (Frost, 2001; Greaney & Arrow, 2012; Nation & Snowling, 2004; National Early Literacy Panel, 2008; Verhagen et al., 2010). The DGPs and the SPP concentrate on oral pronunciation and encourage the development of phonological skills. This research, unlike other programs, provides a set of DBPs that can be applied to different environments through the adaptation of the SPP design to meet individual students' specific needs, particularly in oral proficiency.

These DBPs represent a response to the call that research needs to address what constitutes effective practice, as demonstrated through evidence-based teaching (Levis, 2017). Such research needs to go beyond findings from highly controlled classroom research studies (see Lee et al., 2015 and Norris & Ortega, 2000 for illustrative reviews), and deal with genuine "messy" classroom or school contexts. Classroom environments are varied and English dialects abundant, making a "one size fits all" approach to second-dialect learning unmanageable. The DBPs developed in this research provide a guide to address students' needs in different contexts, but most especially in real-life classroom situations. The DBPs are adaptable to different dialects, different contexts, and even to different class or group sizes. They provide a guide for curriculum developers, teachers, and researchers alike to better support learners of a second dialect in their development of oral communication and pronunciation and literacy skills in that dialect.

Furthermore, Siegel (2010) argues on the basis of his review of literature in the area that there is little research specifically on second-dialect acquisition (SDA). He observes that "most of the in-depth research on second dialect acquisition has been on the acquisition of a second dialect in naturalistic rather than classroom contexts" (p. 19). Here Siegel suggests

that most of the research takes place in natural conversational environments rather than classrooms. He also argues that “research on SDA in educational contexts needs to examine processes of acquisition and attainment in particular linguistic areas” (p. 235). My study addresses a number of Siegel’s concerns. Using a DBR approach, it has a “commitment to examining learning in naturalistic contexts” (Barab & Squire, 2004, p. 2). The empirical component of the research (the evaluation of the two iterations of the SPP) were conducted in classroom contexts, albeit with a small group of children. Secondly, it contributes to the research in the area of SDA by focusing specifically on the linguistic area of phonology.

Choosing content to meet the needs of each child

Class-based programs that involved consonant sounds taught a predetermined set of sounds to the whole class, to facilitate the blending of sounds to make simple words. For example, in Synthetic Phonics instruction /s, æ, t, p/ are the first sounds introduced (Johnston & Watson, 2007). Little consideration is given to the differences between the child’s first and second dialect. English as an Additional Language/Dialect teachers, who primarily teach individual children, focus largely on communication skills rather than the pronunciation of sounds (Martin et al., 1993; NSW Department of Education, 2020). The research conducted in Phase 1 of my study indicated that children’s learning of sounds was enhanced by programs that were individualised to meet the needs of each child. In the development of the SPP, initial consonant selection was guided through a review of the literature (Butcher, 2008; Eades, 1993, 2013; Eagleson, 1982; Kaldor & Malcolm, 1979, 1982, 1991; Sharpe, 1977; Toohill et al., 2012; Williams, 2000), interviews with educational experts, and my previous experience conducting research with young Australian Indigenous children. This process of identifying and including consonants that were pronounced differently in SAE to AAE adds to SDA theory.

Further to this, each child's consonantal needs were assessed through the DEAP assessment tool, which is norm-referenced to the Australian population. Interestingly, the consonant sounds identified by the DEAP assessment tool as being those the children needed to be taught in the SPP were similar to the consonant sounds highlighted in the literature as being pronounced differently in SAE as compared to AAE. This identification of target consonants allowed for in-depth lesson programming and phoneme sequencing. It ensured that the program content met the needs of each individual student, provided important documentation of student learning, and enhanced SDA theory in practice.

Acknowledging and valuing identity, particularly existing linguistic identity

A second key element was determining and then applying knowledge about each child's background, including their heritage, first dialect, identity, and prior learning experiences. This knowledge was used to support the student throughout the program, and was arrived at through consultation with all stakeholders, the use of a range of Indigenous ethical practices (National Health and Medical Research Council, 2018a), and conversations with the children's families and teachers. These were used to ensure culturally sensitive and respectful practices that placed paramount importance on acknowledging and valuing the student, their family, and their community's identity, language/s, and culture.

As the literature on SDA in the classroom highlights (Nicholls, 2005; Sharifian, 2001; Siegel, 2006; Williams, 2011), one of the ways of demonstrating acceptance of the child's dialect is through explicit discussion of the student's first dialect in relation to SAE. This demonstrates the teacher's interest in the child's identity and confirms that they value the student's linguistic identity and value the student as a person.

In my study, this demonstration of valuing a student's identity was further reinforced through the explicit programming of these discussions into lessons. This provided the teacher with the time to make the connections with the student and provide individualised support for

language acquisition. This addition of specific culturally relevant pedagogy documented in the SPP contributes to SDA literature and theory.

A second-dialect phonological pedagogy to meet Indigenous children's needs

Previous research (Baker, 2014; Frazer, 2002; Hismanoglu & Hismanoglu, 2010) points to teachers' use of traditional techniques (such as dictation, reading aloud, and dialogue) that are strongly manipulated by the teacher as a pedagogy of preferred pronunciation. The SPP, however, incorporates haptic techniques that promote awareness of how the sound is pronounced through movement and touch. I argue that the haptic techniques incorporated with the other pedagogy within the SPP extend second-dialect acquisition theory.

Haptic techniques (Acton et al., 2013; Burri et al., 2016; Teaman & Acton, 2013) assisted in the awareness-raising practice, and were particularly useful in teaching the individual sounds, and from my perspective do not receive the attention they deserve in the literature. Although the use of gesture in speech has been considered by others in the research (Dahl & Ludvigsen, 2014; Macedonia & Klimesch, 2014; Morett, 2014), there has been little empirical research on haptic techniques. A thorough search of the literature suggests that this is the first time, both nationally and internationally, that these techniques have been used within a program to teach consonants to young Indigenous children. Previously only a haptic technique focusing on rhythm has been used with a program to enhance oral productive vocabulary (Mister-Colmenares et al., 2020). These pedagogical movement patterns were used to present, teach, and practice consonant sounds. The haptic anchoring of sounds enables the integration of altered articulation and involves teaching movement and gestures (Acton et al., 2013)⁶. This approach aligned with the other pedagogies, including Indigenous pedagogies, used in the program. The students clearly enjoyed them and practiced them of

⁶ In the event that I am unable to teach the haptic techniques, they are available through info@actonhaptic.com

their own volition when they were in the classroom, to support their literacy. This integrated approach had a positive impact on student pronunciation. The haptic techniques were linked with other parts of the program to support student pronunciation acquisition and underpinned further literacy acquisition. This integrated approach, including the haptic techniques, extends second-dialect acquisition theory.

A word on the importance of the teacher delivering the program

I argue on the basis of my study that any phonological program designed for Indigenous children will have limited impact without the professional contribution of a teacher who understands the principles underpinning the program and is capable of enacting them. In other words, the success of any similar phonological program requires a teacher who is responsive to individual children's learning needs and is able to flexibly use age-appropriate and culturally appropriate pedagogies. The teacher also needs to be trained prior to the implementation of the program in phonological and Indigenous pedagogies, particularly haptic techniques, and the importance of valuing identity and language. The teacher and/or the instigator of the program needs to engage in positive communication with all stakeholders (families, students, school personnel, and the community) to provide the community with information that maintains a positive environment for the program.

Conclusion

DBR provided a valuable approach to both contribute to the extension of second-dialect acquisition theory and practice and provide a set of DBPs that can extend and enrich oral proficiency and phonological awareness of young children in different contexts. The DBPs have undergone thorough refinement and offer evidence-based guidance for those wishing to develop and implement programs and practices similar to the individual SPPs described within this research.

Future research prospects

Optimistic outcomes have been demonstrated in this research. However, further research is required to ascertain the effectiveness of the program in other contexts, with other Indigenous populations and in different geographic areas, including international populations. Though the focus of this research was on SAE consonants, the content may be adjusted for other second-dialect/language populations. This could involve vowels or even a vowel-consonant mix and students who speak AAE could be taught with other language learners attaining Standard English as a second language.

CODA

For far too long, educators have found weaknesses in children's literacy acquisition, without thought to the idea that the child may be operating in a second dialect of English. It is paramount that educators have a full understanding of themselves, the learner, and the context to be able to adopt the knowledge, wisdom, and strategies to best suit the students in their care.

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Supplementary Material

Tables

Table 3

Interviewee experience

Participant	Experience
Primary teacher (non-Indigenous)	20 years teaching K-6 and the Reading Recovery Program
Primary teacher (non-Indigenous)	15 years teaching kindergarten
Aboriginal consultant (Indigenous)	23 years teaching & Aboriginal Education Consultant
Primary teacher (non-Indigenous)	36 years teaching kindergarten to year 2 children
Primary teacher (non-Indigenous)	4 years teaching mostly K-1 but experienced K-6
Primary teacher (non-Indigenous)	16 years teaching K-6 & Reading Recovery Program
Aboriginal education & engagement advisor (Indigenous)	12 years teaching & 8 years as Aboriginal education and engagement advisor
University lecturer (non-Indigenous)	11 years teaching as ESL teacher. Learning advisor for academic literacy & lecturer of TESOL
Senior lecturer language & literacy at university (non-Indigenous)	16 years teaching. Reading Recovery and literacy mentor. Senior lecturer in language and literacy
Speech pathologist (non-Indigenous)	8 years' experience particularly with Indigenous children

Participant	Experience
University lecturer (non-Indigenous)	Primary teacher. Set up language programs around NSW. Teacher trainer for Aboriginal students & Aboriginal Education lecturer for pre-service teachers
School learning support officer (Indigenous)	18 years' experience working classrooms K-6
Senior Aboriginal education & engagement officer (Indigenous)	20 years' experience as primary teacher 2.5 years in current placement
University lecturer (non-Indigenous)	Phd in Indigenous Ethics of care as a result of working in remote areas of Australia. Lecturer of Indigenous studies and Arts to pre-service teachers
Senior university lecturer (non-Indigenous)	3 years teacher of English in Japan and teacher of English in China for just under a year. ESL and ESD teacher in several countries. Phd Applied Linguistics. Masters TESOL. Senior lecturer in TESOL and academic program director of postgraduate course work in education.

Table 8*Initial DEAP assessment of Iteration 1*

Child	Challenging Consonant Phoneme	Description of Challenging Consonant Feature	Number of times exhibited
Amy	/θ/	/θ/ substituted with /f/ in initial position Eg. /θaŋkju/ substituted with /faŋkju/	1
Amy	/ð/	/ð/ substituted with /t/ in initial position Eg. /ðɪs/ substituted with /tɪs/	1
Amy	/dʒ/	/dʒ/ substituted with /d/ in initial position Eg. /dʒɜːrɪf/ substituted with /dɜːrɪf/	1
Amy	/ð/	/ð/ substituted with /f/ in medial position Eg. /feðɜː/ substituted with /fefɜː/	2
Amy	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌːθbɪʃ/ substituted with /tʌːfbɪʃ/	2
Amy	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1
Brian	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1
Brian	/dʒ/	/dʒ/ substituted with /z/ in final position Eg. /sɔːsɪdʒ/ substituted with /sɔːsɪz/	1
Connor	/θ/	/θ/ substituted with /f/ in initial position Eg. /θaŋkju/ substituted with /faŋkju/	2
Connor	/ð/	/ð/ substituted with /v/ in medial position Eg. /feðɜː/ substituted with /fevɜː/	2
Connor	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌːθbɪʃ/ substituted with /tʌːfbɪʃ/	2
Connor	/dʒ/	/dʒ/ substituted with /g/ in final position Eg. /sɔːsɪdʒ/ substituted with /sɔːsɪg/	1
Connor	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1
Diane	/θ/	/θ/ substituted with /f/ in initial position	1

		Eg. /θem/ substituted with /fem/	
Diane	/ð/	/ð/ substituted with /f/ in medial position Eg. /feðɜ:/ substituted with /fefɜ:/	1
Diane	/ð/	/ð/ substituted with /d/ in medial position Eg. /feðɜ:/ substituted with /fedɜ:/	1
Emily	/θ/	/θ/ substituted with /f/ in initial position Eg. /θi:/ substituted with /fi:/	1
Emily	/v/	/v/ substituted with /b/ in medial position Eg. /glævz/ substituted with /gləbz/	1
Emily	/ð/	/ð/ substituted with /f/ in medial position Eg. /feðɜ:/ substituted with /fefɜ:/	2
Emily	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌ:θb.ɹɛʃ/ substituted with /tʌ:fb.ɹɛʃ/	2
Emily	/d/	/d/ substituted with a /t/ in medial position Eg. /spædɜ:/ substituted with /spæɹɔ/	1
Emily	/b/	/b/ substituted with /p/ in medial position Eg. /stɪo:b.ɪ:/ substituted with /stɪo:p.ɪ:/	1
Emily	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1
Emily	/dʒ/	/dʒ/ substituted with /ʃ/ in final position Eg. /ɔ.ɪndʒ/ substituted with /ɔ.ɪnʃ/	1

Table 10*Iteration 1: Substitution and their connection to AAE phonological features*

Description of Phonological feature	Description	Number found	Interview participants identified necessary for content	Aboriginal English phonological feature source
/θ/ substituted with /f/	Interdental fricatives replaced by labiodental fricatives (fricative simplification)	Total 15 (5 Initial position 6 medial position 4 final position)	40% of interviewees considered /θ/ necessary	(Eagleson, 1982) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Eades, 1993)
/ð/ substituted with /f/	Interdental fricatives replaced by labiodental fricatives (fricative simplification)	Total 5 All medial position	27% of interviewees considered /ð/ necessary	(Eagleson, 1982) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Eades, 1993)
/ð/ substituted with /v/	Interdental fricatives replaced by labiodental fricatives (fricative simplification)	Total 2 All medial position	27% of interviewees considered /ð/ necessary	(Eagleson, 1982) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Eades, 1993)
/v/ substituted with /b/	Alternation of voiced fricative and voiced plosive	1 Medial position	6.6% of interviewees considered /v/ Necessary	(Butcher, 2008) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Malcolm, 2018)
/dʒ/ substituted with /ʃ/	Voiceless postalveolar fricative substituted for voiced postalveolar affricative	1 Final position	6.6% of interviewees considered /dʒ/ necessary	(Kaldor & Malcolm, 1982) (Butcher, 2008) (Dodd et al., 2002)

Description of Phonological feature	Description	Number found	Interview participants identified necessary for content	Aboriginal English phonological feature source
/dʒ/ substituted with /z/	Affricatives substituted with fricatives	1 Final position	6.6% of interviewees considered /dʒ/ necessary	(Kaldor & Malcolm, 1991) (Kaldor & Malcolm, 1982)
/dʒ/ substituted with /d/	Affricatives alternating with plosives.	1 Initial position	6.6% of interviewees considered /dʒ/ necessary	No source
/dʒ/ substituted with /g/	Affricatives alternating with plosives.	1 Final position	6.6% of interviewees considered /dʒ/ necessary	No source
/ð/ substituted with /t/	Fricatives substituted with plosives (voiced and voiceless stops)	1 Initial position	27% of interviewees considered /ð/ necessary	(Dodd et al., 2002) (Kaldor & Malcolm, 1991) (Kaldor & Malcolm, 1982) (Butcher, 2008) (Eades, 1993)
/ð/ substituted with /d/	Fricatives substituted with plosives (voiced and voiceless stops)	1 Medial position	27% of interviewees considered /ð/ necessary	(Dodd et al., 2002) (Kaldor & Malcolm, 1991) (Kaldor & Malcolm, 1982) (Butcher, 2008) (Eades, 1993) (Malcolm, 2018)
/d/ substituted with /t/	Alternation of voiced and voiceless plosives	1 Medial position	27% of interviewees considered /t/ necessary 6.6% of interviewees considered /d/, /p/ and /b/ necessary	(Butcher, 2008) (Kaldor & Malcolm, 1991) (Kaldor & Malcolm, 1982)

Description of Phonological feature	Description	Number found	Interview participants identified necessary for content	Aboriginal English phonological feature source
/b/ substituted with /p/	Alternation of voiced and voiceless plosives	1 Medial position	6.6% of interviewees considered /d/, /p/ and /b/ necessary	(Butcher, 2008) (Kaldor & Malcolm, 1991) (Kaldor & Malcolm, 1982)

Table 11

Iteration 1: DEAP assessments: Initial and final assessment results

Child's designation	Description of Phonological feature	No. of times exhibited in Initial DEAP	No. of times exhibited in Final DEAP
Amy	/ð/ substituted with /f/ in medial position Eg. /feðz:/ substituted with /fefz:/	2	1
Amy	/θ/ substituted with /f/ in initial position Eg. /θaŋkju/ substituted with /faŋkju/	1	0
Amy	/ð/ substituted with /t/ in initial position Eg. /ðɪs/ substituted with /tɪs/	1	0
Amy	/dʒ/ substituted with /d/ in initial position Eg. /dʒɜːrɪf/ substituted with /dɜːrɪf/	1	0
Amy	/θ/ substituted with /f/ in medial position Eg. /tʌθbɪrɪʃ/ substituted with /tʌfbɪrɪʃ/	2	0
Amy	/θ/ substituted with /f/ in final position Eg. /tɪθ/ substituted with /tɪf/	1	0
Brian	/θ/ substituted with /f/ in final position Eg. /tɪθ/ substituted with /tɪf/	1	0
Brian	/dʒ/ substituted with /z/ in final position Eg. /sɒsɪdʒ/ substituted with /sɒsɪz/	1	0

Child's designation	Description of Phonological feature	No. of times exhibited in Initial DEAP	No. of times exhibited in Final DEAP
Connor	/ð/ substituted with /f/ in medial position Eg. /feðɜ:/ substituted with /fefɜ:/	0	1
Connor	/ð/ substituted with /v/ in medial position Eg. /feðɜ:/ substituted with /fevɜ:/	2	0
Connor	/θ/ substituted with /f/ in initial position Eg. /θaŋkju/ substituted with /faŋkju/	2	0
Connor	/θ/ substituted with /f/ in medial position Eg. /tæ:θbɪɹ ʃ/ substituted with /tæ:fbɪɹ ʃ/	2	0
Connor	/dʒ/ substituted with /g/ in final position Eg. /sɔsɪdʒ/ substituted with /sɔsig/	1	0
Connor	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1	0
Diane	/ð/ substituted with /f/ in medial position Eg. /feðɜ:/ substituted with /fefɜ:/	1	1
Diane	/θ/ substituted with /f/ in initial position Eg. /θɛm/ substituted with /fɛm/	1	0
Diane	/ð/ substituted with /d/ in medial position Eg. /feðɜ:/ substituted with /fedɜ:/	1	0
Emily	/dʒ/ substituted with /ʃ/ in final position Eg. /ɔɪndʒ/ substituted with /ɔɪnʃ/	1	1
Emily	/v/ substituted with /b/ in medial position Eg. /glɛvz/ substituted with /glɛbz/	1	1
Emily	/θ/ substituted with /f/ in initial position Eg. /θɪi:/ substituted with /fi:/	1	1
Emily	/ð/ substituted with /f/ in medial position Eg. /feðɜ:/ substituted with /fefɜ:/	2	1
Emily	/t/ substituted with /k/ in initial position Eg. /tɔmɛtə/ substituted with /kɔmɛtə/	0	1
Emily	/d/ substituted with a /t/ in medial position Eg. /spædɜ:/ substituted with /spæɛtɜ/	1	1

Child's designation	Description of Phonological feature	No. of times exhibited in Initial DEAP	No. of times exhibited in Final DEAP
Emily	/θ/ substituted with /f/ in medial position Eg. /tʌ:θb.rɛ ʃ/ substituted with . /tʌ:fb.rɛ ʃ/	2	0
Emily	/b/ substituted with /p/ in medial position Eg. /stɪo:b.i:/ substituted with /stɪo:p.i:/	1	0
Emily	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1	0

Table 12*Iteration 1 writing samples*

Student	Dictation passage as written by participant	Description of phonological features substituted in DEAP assessment	Discussion
Amy	The girafe and the thin frog both brushed there teeth with toofpast and a fefer over the sinck ner the frige.	/ð/ substituted with /f/ in medial position /θ/ substituted with /f/ in medial position /dʒ/ substituted with /g/ in writing the word 'fridge'	In the word 'feather' /ð/ was substituted with /f/ /θ/ was substituted with /f/ in writing the word 'toothpaste' 'ge' was used in place of 'dʒe' in the written word 'fridge' 'c' addition in the word 'sink'
Brian	Both the graife and the thin frog brushed there teeth with toothpaste and a feather over the sink near the fridge.	All target phonemes articulated	Target consonants written accurately
Connor	The jiraf and the thin frog both brushed their teeth with toothpast and a fefer over The sink near the frig.	/ð/ substituted with /f/ in medial position /dʒ/ substituted with /g/ in final position	In the word 'feather' / ð/ was substituted with /f/. /dʒ/ substituted with /g/ in writing the word 'fridge'

Student	Dictation passage as written by participant	Description of phonological features substituted in DEAP assessment	Discussion
Diane	The jera f and the thin fo g both bus h t ther teth with tothpastt and a fe f er ova the sinc ner the fre g cg.	/ð/ substituted with /f/ in medial position /d/ substituted with /t/ in final position	In the word ‘feather’ / ð/ was substituted with /f/ /r/ was not written in the word ‘frog’ and /t/ is written for /d/ in the word ‘brushed’. In the word ‘fridge’ ‘gcg’ is written for ‘dge’.
Emily	The sh era f and the fin frog both bro sh t ther teeth w n i th toothpastt and a fe f ther v re o the sinc ner the fri g j.	/dʒ/ substituted with /ʃ/ in initial position /d/ omission in final position /n/ addition in medial position /dʒ/ substituted with /g/ in final position /θ/ substituted with /f/ in initial position /f/ addition in medial position	In the word ‘giraffe’ /dʒ/ was written as /ʃ/. ‘gj’ was written in the word ‘fridge’ for ‘dge’ which is in the final position. In the word ‘over’ /v/ was written in the initial position. The word ‘thin’ was written as ‘fin’ /ð/ in the word ‘feather’ was written with /f/ before it

Table 15*Initial DEAP assessment of Iteration 2*

Child	Challenging Consonant Phoneme	Description of Challenging Consonant Feature	Number of times exhibited
Ann	/dʒ/	/dʒ/ substituted with /d/ in initial position Eg. /dʒəɪf/ substituted with /dəɪf/	1
Ann	/θ/	/θ/ substituted with /f/ in initial position Eg. /θi/ substituted with /fi/	2
Ann	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /ti:f/	1
Ann	/ð/	/ð/ substituted with /f/ in medial position Eg. /feðz:/ substituted with /fefz:/	2
Ann	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌ:θbɹɛʃ/ substituted with . /tʌ:fbɹɛʃ/	2
Bree	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1
Bree	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌ:θbɹɛʃ/ substituted with . /tʌ:fbɹɛʃ/	2
Bree	/ð/	/ð/ substituted with /d/ in medial position Eg. /feðz:/ substituted with /fedz:/	1
Collin	/θ/	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1
Collin	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌ:θbɹɛʃ/ substituted with . /tʌ:fbɹɛʃ/	1
Collin	/θ/	/θ/ omission in medial position Eg. /tʌ:θbɹɛʃ/ substituted with . /tʌ:bɹɛʃ/	2
Collin	/ð/	/ð/ substituted with /d/ in medial position Eg. /feðz:/ substituted with /fedz:/	1
Collin	/dʒ/	/dʒ/ substituted with /tʃ/ in final position Eg. /sɔ:sidʒ/ substituted with /sɔ:sitʃ/	2

Child	Challenging Consonant Phoneme	Description of Challenging Consonant Feature	Number of times exhibited
Dayana	/θ/	/θ/ substituted with /f/ in final position Eg. /ti:θ/ substituted with /ti:f/	1
Dayana	/b/	/b/ substituted with /p/ in final position Eg. /krab/ substituted with /krap/	1
Dayana	/θ/	/θ/ omission in medial position Eg. /tʌ:θbɹæf/ substituted with . /tʌ:bɹæf/	2
Dayana	/θ/	/θ/ substituted with /f/ in medial position Eg. /tʌ:θbɹæf/ substituted with . /tʌ:fbɹæf/	1
Dayana	/ð/	/ð/ substituted with /f/ in medial position Eg. /feðz:/ substituted with /fefz:/	1
Eli	/v/	/v/ substituted with /b/ in medial position Eg. /glævz/ substituted with /gləbz/	1
Eli	/ð/	/ð/ substituted with /d/ in medial position Eg. /feðz:/ substituted with /fedz:/	2

Table 16

Iteration 2: Substitution and their connection to AAE phonological features

Description of Phonological feature	Description	Number found	Interview participants identified necessary for content	Aboriginal English phonological feature source
/θ/ substituted with /f/	Interdental fricatives replaced by labiodental fricatives (fricative simplification)	Total 12 (2 Initial position 6 medial position 4 final position)	40% of interviewees considered /θ/ necessary	(Eagleson, 1982) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Eades, 1993)
/ð/ substituted with /f/	Interdental fricatives replaced by labiodental fricatives	Total 3 All medial position	27% of interviewees considered /ð/ necessary	(Eagleson, 1982) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Eades, 1993)

Description of Phonological feature	Description	Number found	Interview participants identified necessary for content	Aboriginal English phonological feature source
/ð/ substituted with /d/	Interdental fricatives replaced by voiced plosives	Total 4 All medial position	27% of interviewees considered /ð/ necessary	(Kaldor & Malcolm, 1991) (Kaldor & Malcolm, 1979, 1982; Williams, 2000) (Butcher, 2008) (Malcolm, 2018)
/v/ substituted with /b/	Alternation of voiced fricative and voiced plosive	1 Medial position	6.6% of interviewees considered /v/ necessary	(Butcher, 2008) (Kaldor & Malcolm, 1991) (Dodd et al., 2002) (Malcolm, 2018)
/b/ substituted with /p/	Alternation of voiced plosives and unvoiced plosives (context sensitive voicing)	1 Final position	6.6% of interviewees considered /d/, /p/ and /b/ necessary	(Butcher, 2008) (Kaldor & Malcolm, 1982, 1991; Williams, 2000)
/dʒ/ substituted with /d/	Affricatives alternating with plosives.	1 Initial position	6.6% of interviewees considered /dʒ/ necessary	Not identified in the literature
/dʒ/ substituted with /tʃ/	Affricates alternating with affricates.	1 Final position	6.6% of interviewees considered /dʒ/ necessary	Not identified in the literature

Table 18*Iteration 2 DEAP assessments: Initial and final assessment results*

Child's designation	Description of Phonological feature	No. of times exhibited in Initial DEAP	No. of times exhibited in Final DEAP
Ann	/ð/ substituted with /f/ in medial position Eg. /feðz:/ substituted with /fefz:/	2	1
Ann	/θ/ substituted with /f/ in medial position Eg. /tʌ:θb.rɛf/ substituted with /tʌ:fb.rɛf/	2	2
Ann	/dʒ/ substituted with /d/ in initial position Eg. /dʒəɪf/ substituted with /dəɪf/	1	0
Ann	/θ/ substituted with /f/ in initial position Eg. /θi:/ substituted with /fi:/	2	0
Ann	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /ti:f/	1	0
Bree	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1	0
Bree	/θ/ substituted with /f/ in medial position Eg. /tʌ:θb.rɛf/ substituted with . /tʌ:fb.rɛf/	2	0
Bree	/ð/ substituted with /d/ in medial position Eg. /feðz:/ substituted with /fedz:/	1	0
Collin	/θ/ substituted with /f/ in initial position Eg. /θi:/ substituted with /fi:/	0	1
Collin	/θ/ substituted with /f/ in final position Eg. /tiθ/ substituted with /tif/	1	0
Collin	/θ/ substituted with /f/ in medial position Eg. /tʌ:θb.rɛf/ substituted with . /tʌ:fb.rɛf/	1	0
Collin	/θ/ omission in medial position Eg. /tʌ:θb.rɛf/ substituted with . /tʌ:b.rɛf/	2	0
Collin	/ð/ substituted with /d/ in medial position Eg. /feðz:/ substituted with /fedz:/	1	0

Child's designation	Description of Phonological feature	No. of times exhibited in Initial DEAP	No. of times exhibited in Final DEAP
Collin	/dʒ/ substituted with /tʃ/ in final position Eg. /sɔːsɪdʒ/ substituted with /sɔːsɪtʃ/	2	0
Dayana	/θ/ substituted with /f/ in final position Eg. /ti:θ/ substituted with /ti:f/	1	0
Dayana	/b/ substituted with /p/ in final position Eg. /krab/ substituted with /krap/	1	0
Dayana	/θ/ omission in medial position Eg. /tʌ:θb.rɛf/ substituted with . /tʌ:b.rɛf/	2	0
Dayana	/θ/ substituted with /f/ in medial position Eg. /tʌ:θb.rɛf/ substituted with . /tʌ:fb.rɛf/	1	0
Dayana	/ð/ substituted with /f/ in medial position Eg. /feðz:/ substituted with /fefz:/	1	1
Eli	/v/ substituted with /b/ in medial position Eg. /glɛvz/ substituted with /glɛbz/	1	0
Eli	/ð/ substituted with /d/ in medial position Eg. /feðz:/ substituted with /fedz:/	2	0

Table 19*Iteration 2: Initial and final writing sample comparison*

Participant	Initial SPP dictation passage	Final SPP dictation passage	Analysis of targeted written sounds
Bree	Both the gaffrafer and the thin frog bushed there teeth with toothpased and a fafther over The sink near the feged.	Both the graffer and the thin frog brushed there teeth with toothpasted and a feather over the sink near the frige.	<p>/θ/ in both medial and final positions was correct in both pre and post samples. This student already knew that /θ/ was written as ‘th’</p> <p>/ð/ substituted with /d/ in medial position in the DEAP was written as ‘fth’ in feather in the pre SPP sample and correctly in the post SPP sample. She developed her understanding of how to write /ð/ during this time.</p> <p>Inserted an extra /f/ sound into ‘giraffe’ in initial sample and didn’t use it in the final sample. Learned it was not needed.</p> <p>Omitted /ɪ/ in the word ‘brushed’ in initial sample and placed it correctly in final sample.</p> <p>Added /ɪ/ to the end of the word ‘giraffe’ in both the initial and final samples.</p>

Participant	Initial SPP dictation passage	Final SPP dictation passage	Analysis of targeted written sounds
Bree			<p>Added 'd' to the end of the word 'toothpaste' in both the initial and final samples.</p> <p>Added /ɪ/ to the word 'fridge' in final sample.</p> <p>Wrote /dʒ/ as 'ged' in initial sample and as 'ge' in final sample.</p>
Collin	Booth the giraffe and the thin from brusht there teeth with toothpaste and a fadre voer the sink ny the frige.	Both the giraffe and the thin frog brusht there teeth with toothpayst and a fethra over the sinc niey the frige.	<p>/θ/ in both initial, medial and final positions was correct in both samples. Child already knew how to write /θ/.</p> <p>/ð/ substituted with /d/, in 'feather' in the initial SPP sample and correctly in the final SPP sample. She learnt /ð/ was written as 'th' in medial position during this time.</p> <p>/dʒ/ in 'fridge' written as 'ge' instead of 'dge' in both initial and final samples. No change in the written understanding of the sound /dʒ/.</p> <p>/g/ written as 'm' in the word 'frog' in the initial sample and as 'g' in the final sample.</p>

Participant	Initial SPP dictation passage	Final SPP dictation passage	Analysis of targeted written sounds
Collin			Added 't' to the final position in the 'brushed' in both the initial and final SPP samples. In the word 'brushed' 'ed' does sound /t/ he is writing phonetically.
Dayana	Both the grafaf and the thin frog basht there teeth with tothpast and a farari over the sekc ner the frish.	Both the graif and the thin frog brasht there teeth with the toothpast and a fevar over the sick ner the frig.	<p>/θ/ in both medial and final positions was correct in both initial and final samples. Child already knew that /θ/ was written as 'th'.</p> <p>/ð/ written as 'r' in 'feather' in the initial SPP sample and as 'v' in the final sample. Child didn't learn that /ð/ is represented as 'th' in the medial position in writing. She did write /ð/ in the initial position in 'the' and 'there' in both samples.</p> <p>/b/ was written correctly in both writing samples. Child already knew that /b/ was represented by 'b' in writing.</p> <p>Initial writing sample shows 'giraffe' written with a double 'af' which was not used in the final writing sample.</p>

Participant	Initial SPP dictation passage	Final SPP dictation passage	Analysis of targeted written sounds
Dayana			<p>/r/ omit in the word 'brushed' in the initial writing sample is included in the final writing sample. The use of 't' instead of 'ed' in 'brushed' remained in both writing samples. 'ed' does sound /t/ in this word. She is writing phonetically.</p> <p>The /n/ omit in the word 'sink' was evident in both the initial and final writing samples.</p> <p>The /dʒ/ sound in the word 'fridge' was substituted with 'sh' in the initial writing sample and 'g' in the final writing sample. She didn't learn to write /dʒ/ as 'dge' in the final position.</p>
Eli	<p>/ð/ - words 'the' and 'father' written as 'the' and 'fader'. When asked to write the sound he wrote 'd'.</p> <p>/v/ - words 'vat' and 'five' written as 'vat' and 'fib'. When asked to write /v/ he said "I don't know how to."</p> <p>/b/ - words 'ball' and 'bib' written as 'bol' and 'biz'. When asked to write /b/ he wrote 'b'.</p>	<p>/ð/ - words 'the' and 'father' written as 'the' and 'father'. When asked to write the sound he wrote 'th'.</p> <p>/v/ - words 'vat' and 'five' written as 'vat' and 'fiv'. When asked to write /v/ he wrote 'v'.</p> <p>/b/ - words 'ball' and 'bib' written as 'ball' and 'bib'. When asked to write /b/ he wrote 'b'.</p>	<p>Learnt to write 'th' for /ð/ during this time.</p> <p>He consolidated his understanding of /v/ and began to write it as 'v'.</p> <p>Consolidated his understanding that /b/ was written as 'b' prior to the SPP.</p>

Participant	Initial SPP dictation passage	Final SPP dictation passage	Analysis of targeted written sounds
Eli	/θ/ - words 'this' and 'them' written as 'this' and 'them'. When asked to write the sound she wrote 'th'.	/θ/ - words 'this' and 'them' written as 'this' and 'them'. When asked to write the sound she wrote 'th'.	He already knew that /θ/ was written as 'th' prior to the SPP. Alternatively he may have known them as sight words.
	/d/ - words 'mad' and 'dog' written as 'dog' and 'mad'. When asked to write /d/ he wrote 'd'	/d/ - words 'mad' and 'dog' written as 'dog' and 'mad'. When asked to write /d/ he wrote 'd'	Child knew that /d/ was represented by 'd' in writing prior to the SPP.
Ann	/ð/ - words 'the' and 'father' written as 'the' and 'fafer'. When asked to write the sound she wrote 'f'.	/ð/ - words 'the' and 'father' written as 'the' and 'fafer'. When asked to write the sound she wrote 'f'.	Child didn't learn that /ð/ is written as 'th'. She remained using 'f'.
	/θ/ - words 'this' and 'them' written as 'fis' and 'fem'. When asked to write the sound she wrote 'f'.	/θ/ - words 'this' and 'them' written as 'fis' and 'fem'. When asked to write the sound she wrote 'f'.	Child didn't learn that /θ/ is written as 'th'. She remained using 'f'.
	/dʒ/ - words 'jet' and 'jog' written as 'tet' and 'tog'. When asked to write the sound she wrote 't'	/dʒ/ - words 'jet' and 'jog' written as 'jet' and 'jog'. When asked to write the sound she wrote 'j'	Child learnt that /dʒ/ is represented by 'j' in writing during this time.
	/d/ - words 'mad' and 'dog' written as 'dog' and 'mad'. When asked to write /d/ she wrote 'd'	/d/ - words 'mad' and 'dog' written as 'dog' and 'mad'. When asked to write /d/ she wrote 'd'	Child knew that /d/ was represented by 'd' in writing prior to the SPP.
	/f/ - words 'fib' and 'fat' written as 'fid' and 'fat'. When asked to write /f/ she wrote 'f'.	/f/ - words 'fib' and 'fat' written as 'fid' and 'fat'. When asked to write /f/ she wrote 'f'.	Child knew that /f/ was represented by 'f' in writing prior to the SPP.

Appendices

APPENDIX A: Letters emailed to prospective participants in interviews and focus groups

INVITATION LETTER FOR EDUCATORS



Dear _____,

As a Doctor of Philosophy – Research student at the University of Wollongong, I invite your participation in a research study entitled, *Development of a sociocultural program to support young Aboriginal children's consonant production*. This study is exploring the most effective pedagogy, practice and engagement methods in the creation of a consonant program to support Aboriginal children (5-7 year-old) who may speak Australian Aboriginal English dialects (may not know they are speaking AAE). The aim is to develop a program that can be used to support children with Australian Aboriginal English backgrounds.

Children involved in the study will participate in the program's implementation and trial. Ten children will be invited to participate (2 phases with 5 children per implementation phase). They will undergo a pre and post Diagnostic Evaluation of Articulation and Phonology assessment which will be carried out during class time. Researchers will withdraw kindergarten, Year One and Year Two students from class for approximately 20-30 min to complete this task. Program implementation will take place during class time which will be negotiated with class teachers and will take approximately 60 minutes a week for ten weeks (2 phases of 10 weeks a phase is 20 weeks in total). The study will cause minimal disruption to regular routines.

Your involvement in the study would be greatly appreciated and should you decide to be involved you will be asked to participate in a semi-structured interview in order to gain relevant background information and discuss effective pedagogy, practice and engagement methods in the development of the program. At the end of the interview you may choose to further assist with the refinement of the program through focus group discussions. This however, is at your discretion. All data collected during this research will be kept on a password protected computer or in a locked cabinet for five years, after which time it will be destroyed.

The attached Information Sheet provides further background information about the study and methods used in the research. As a first step, I ask that you contact me by phone or email to inform me of your involvement. If I do not hear from you, I will contact soon in order to ascertain your involvement in the study and to answer any questions you may have. Your support is most gratefully appreciated. Please feel free to contact me with any questions or concerns you or your teachers may have.

Kind regards,

Carolyn Pogson
Doctor of Philosophy Candidate
School of Education
University of Wollongong
Phone:
Email: carolyn.pogson@det.nsw.edu.au

PARTICIPATION INFORMATION FOR EDUCATORS

TITLE: Development of a sociocultural program to support young Aboriginal children's consonant production.

PURPOSE OF THE RESEARCH:

This is an invitation to participate in a study conducted by a Doctor of Philosophy student from the University of Wollongong. The purpose of this study is to explore the most effective pedagogy, practice and engagement methods in order to create a consonant program to support Aboriginal children (5-7 year old) who may speak Australian Aboriginal English dialects (may not know they are speaking AAE).

Both the researchers and the study respect and value Aboriginal languages and dialects.

INVESTIGATORS:

Mrs Carolyn Pogson
 Doctor of Philosophy – Research student
 School of Education
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 Phone:
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Dr Michelle Eady
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 School of Education
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Dr Amanda Baker
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 School of Education
 University of Wollongong
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Professor Jan Wright
 Professorial Fellow
 School of Education
 University of Wollongong

METHOD AND DEMANDS ON PARTICIPANTS:

If you choose to participate in the research you will be invited to participate in three activities. The first is a semi-structured interview to explore the most effective pedagogy, practice and engagement techniques when teaching consonants to Aboriginal young children.

Secondly, at the end of the interview you will be invited to participate in the refinement of the program through focus group meetings (3-4 meetings). Your participation in the focus group is entirely your choice. It does involve being available to meet on three or four occasions for approximately 30 minutes, to discuss the program either through Skype or in person.

Thirdly, the school will be asked to accommodate the researcher as they conduct DEAP assessments and program trials with five Aboriginal children over a 6-9 month period. Children will be asked to participate in the Diagnostic Evaluation of Articulation and Phonology assessment (DEAP assessment) which involves the identification of sounds, words, sounds within words and sounds in sentences. It will take approximately 20-30 minutes and will be administered both prior to and following their participation in a consonant program. This program will take approximately 60 minutes a week to complete over a school term (10 minutes a day for four days a week). Throughout this time children will be asked to say, read and write sounds, using materials such as books, whiteboards, computers and pencil and paper. Some of these pieces of work will be used to guide future planning of the program. Disruption would be kept to a minimum through the negotiation of times with the researcher.

DATA GATHERING AND STORAGE:

Data gathered for this study, which includes video recordings, audio recordings, transcriptions, assessment data and DEAP assessment results. It will be stored in a locked cabinet in the work area of the researcher. The names and locations of participants, their responses and their assessment data will remain confidential. All data collected during this research will be used for analysis only and kept on a password protected computer or in a locked cabinet for five years, after which time it will be destroyed.

POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS:

Apart from the time involved in completing interviews and focus group activities, the inconvenience of students' involvement in DEAP assessment and the program trials, there are no foreseeable risks to you. Your involvement in the study is voluntary. Choosing not to participate will in no way affect your relationship with the University of Wollongong, your teaching or your personal life.

REPORTING RESEARCH FINDINGS:

At the conclusion of data collection and analysis the research findings will be reported on at a presentation evening, to which you will be invited. Findings will be published in thesis. Confidentiality is assured. Neither you nor your school will be identified in any part of the research.

FUNDING AND BENEFITS OF THE RESEARCH:

This study is supported by the University of Wollongong and resourced by the student involved. This research will develop a much needed program to support Aboriginal students' phonological development and aims to further support them in their learning.

ETHICS AND BENEFITS OF THE RESEARCH:

This study has been reviewed by the Human Research Ethics Committee of the University of Wollongong and the State Education Research Approval Process (SERAP). If you have any questions about the research you can contact Mrs Carolyn Pogson on 0408493534 or via email at carolyn.pogson@det.nsw.edu.au or if you have any concerns or complaints regarding the way this research is being conducted, you can contact the UOW Ethics Officer by telephone at +61 (02) 42214457 or email rso-ethics@uow.edu.au.

Thank you for your support and interest in this study.

Carolyn Pogson
 Doctor of Philosophy Candidate
 Faculty of Education
 University of Wollongong
 Phone: 0408493534
 Email: carolyn.pogson@det.nsw.edu.au

EDUCATOR CONSENT FORM

TITLE: Development of a program to support young Aboriginal children's consonant production.

I have been given information about the study. I have been advised of my role and the responsibilities of the researchers associated with the research. I understand that information that may link me to the study will not be reported on and that all information will be used in ways that will protect my

confidentiality. I am aware that all data collected during this research will be kept on a password protected computer or in a locked cabinet for five years, after which time it will be destroyed. I have had an opportunity to ask the researchers any questions I may have about the research including my involvement.

My involvement in this study is in the form of an interview regarding children's acquisition of consonant sounds, pedagogy and engagement in learning and the dialectal differences between Aboriginal English and Standard Australian English. It may, with my agreement, also include my involvement in focus group meetings to refine the program. I understand that 10 children will participate in the research consonant program which will take approximately 60 minutes a week for 10 weeks to complete.

I understand that participation in this research is voluntary. I understand that I am free not to participate in the research and I understand that I am free to withdraw from the research at any time providing that the researchers are informed of my decision no longer than one month after the completion of data collection. My refusal to participate or withdrawal of consent will not affect my professional or personal life.

This study has been reviewed by the Human Research Ethics Committee of the University of Wollongong and the state Education Research Approval Process (SERAP). If I have any questions about the research, I can contact Mrs Carolyn Pogson at 0408493534 or via email at carolyn.pogson@det.nsw.edu.au. If I have any concerns or complaints regarding the way this research is being conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong by telephone at (02) 42214457 or email at ethics@uow.edu.au. By completing the form below I am agreeing to participate in the research.

I _____ consent to (*please tick*):

- My participation in an interview
- I understand the interview will be video or audio recorded.
- My participation in focus group meetings.
- I understand that some children in my class will participate in a consonant program for 60 minutes a week for 10 weeks.
- I understand that the data collected from my participation will be used for the purpose of providing information that can be used to create better support for children with Australian Aboriginal English backgrounds. Findings from the study may become part of published reports in teacher or educational research journals and I consent for my data to be used in this manner.

Signed: _____ Date: _____

INVITATION LETTER FOR ABORIGINAL ELDERS OR ABORIGINAL COMMUNITY MEMBERS



Dear _____,

I invite your participation in a research study entitled, *Development of a sociocultural program to support young Aboriginal children's consonant production*. This study is exploring the most effective pedagogy, practice and engagement methods in the creation of a consonant program to support Aboriginal children (5-7 year old). The aim is to develop a program that can be used to support children with Australian Aboriginal English backgrounds.

Children involved in the study will participate in the program's implementation and trial. Ten children will be invited to participate (2 phases with 5 children per implementation phase). They will undergo a pre and post Diagnostic Evaluation of Articulation and Phonology assessment which will be carried out during class time. Researchers will withdraw kindergarten, Year One and Year Two students from class for approximately 20-30 min to complete this task. Program implementation will take place during class time which will be negotiated with you as class teachers and will take approximately 60 minutes a week for ten weeks (2 phases of 10 weeks a phase is 20 weeks in total). The study will cause minimal disruption to your regular routine.

Your involvement in the study would be greatly appreciated and should you decide to be involved you will be asked to participate in a semi-structured interview in order to gain relevant background information and discuss effective pedagogy, practice and engagement methods in the development of the program. At the end of the interview you may choose to further assist with the refinement of the program through focus group discussions. This however, is your choice. All data collected during this research will be kept on a password protected computer or in a locked cabinet for five years, after which time it will be destroyed.

The attached Information Sheet provides further background information about the study and methods used in the research. As a first step, I ask that you contact me by phone or email to inform me of your involvement. If I do not hear from you, I will contact soon in order to ascertain your involvement in the study and to answer any questions you may have. Your support is most gratefully appreciated. Please feel free to contact me with any questions or concerns you or your teachers may have.

Kind regards,

Carolyn Pogson
Doctor of Philosophy Candidate
School of Education
University of Wollongong
Phone:
Email: carolyn.pogson@det.nsw.edu.au

PARTICIPATION INFORMATION FOR ABORIGINAL ELDERS OR ABORIGINAL COMMUNITY MEMBERS

TITLE: Development of a sociocultural program to support young Aboriginal children's consonant production.

PURPOSE OF THE RESEARCH:

The purpose of this study is to explore the most effective pedagogy, practice and engagement methods in order to create a consonant program to support Aboriginal children (5-7 year olds) who may speak Australian Aboriginal English dialects (may not know they are speaking AAE).

Both the researchers and the study respect and value Aboriginal languages and dialects.

INVESTIGATORS:

Mrs Carolyn Pogson
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Dr Michelle Eady
 Lecturer
 School of Education
 University of Wollongong

Professor Jan Wright
 Professorial Fellow
 School of Education
 University of Wollongong

METHOD AND DEMANDS ON PARTICIPANTS:

If you choose to participate in the research you will be asked to participate in three activities. The first is a semi-structured interview to explore the most effective pedagogy, practice and engagement techniques when teaching consonants to Aboriginal young children.

Secondly, at the end of the interview you will be invited to participate in the refinement of the program through focus group meetings (3-4 meetings). Your participation in the focus group is entirely your choice. It does involve being available to meet on three or four occasions for approximately 30 minutes, to discuss the program either through Skype or in person.

Thirdly, the school will be asked to accommodate the researcher as they conduct DEAP assessments and program trials with five Aboriginal children over a 6-9 month period. Children will be asked to participate in the Diagnostic Evaluation of Articulation and Phonology assessment (DEAP assessment) which involves the identification of sounds, words, sounds within words and sounds in sentences. It will take approximately 20-30 minutes and will be administered both prior to and following their participation in a consonant program. This program will take approximately 60 minutes a week to complete over a school term (10 minutes a day for four days a week). Throughout this time children will be asked to say, read and write sounds, using materials such as books, whiteboards, computers and pencil and paper. Some of these pieces of work will be used to guide future planning of the program. Disruption would be kept to a minimum through the negotiation of times with the researcher.

DATA GATHERING AND STORAGE:

Data gathered for this study, which includes video recordings, audio recordings, transcriptions, assessment data and DEAP assessment results. It will be stored in a locked cabinet in the work area of the researcher. The names and locations of participants, their responses and their assessment data will remain confidential. All data collected during this research will be used for analysis only and kept on a password protected computer or in a locked cabinet for five years, after which time it will be destroyed.

POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS:

Apart from the time involved in completing interviews and focus group activities, the inconvenience of students' involvement in DEAP assessment and the program trials, there are no foreseeable risks to you. Your involvement in the study is voluntary. Choosing not to participate will in no way affect your relationship with the University of Wollongong, your professional or your personal life.

REPORTING RESEARCH FINDINGS:

At the conclusion of data collection and analysis the research findings will be reported on at a presentation evening, to which you will be invited. Findings will be published in thesis. Confidentiality is assured. Neither you nor your school will be identified in any part of the research.

FUNDING AND BENEFITS OF THE RESEARCH:

This study is supported by the University of Wollongong and resourced by the student involved. This research will develop a much needed program to support Aboriginal students' phonological development and aims to further support them in their learning.

ETHICS AND BENEFITS OF THE RESEARCH:

This study has been reviewed by the Human Research Ethics Committee of the University of Wollongong and the State Education Research Approval Process (SERAP). If you have any questions about the research you can contact Mrs Carolyn Pogson on 0408493534 or via email at carolyn.pogson@det.nsw.edu.au or if you have any concerns or complaints regarding the way this research is being conducted, you can contact the UOW Ethics Officer by telephone at +61 (02) 42214457 or email rso-ethics@uow.edu.au.

Thank you for your support and interest in this study.

Carolyn Pogson
Doctor of Philosophy Candidate
Faculty of Education
University of Wollongong
Phone:
Email: carolyn.pogson@det.nsw.edu.au

ABORIGINAL ELDERS OR ABORIGINAL COMMUNITY MEMBERS CONSENT FORM

TITLE: Development of a program to support young Aboriginal children's consonant production.

I have been given information about the study. I have been advised of my role and the responsibilities of the researchers associated with the research. I understand that information that may link me to the study will not be reported on and that all information will be used in ways that will protect my confidentiality. I am aware that all data collected during this research will be kept on a password protected computer or in a locked cabinet for five years, after which time it will be destroyed. I have had an opportunity to ask the researchers any questions I may have about the research including my involvement.

My involvement in this study is in the form of an interview regarding children's acquisition of consonant sounds, pedagogy and engagement in learning and the dialectal differences between Aboriginal English and Standard Australian English. . It may, with my agreement, also include my involvement in focus group meetings to refine the program. I understand that some children in my class will participate in the research consonant program which will take approximately 60 minutes a week for 10 weeks.

I understand that participation in this research is voluntary. I understand that I am free not to participate in the research and I understand that I am free to withdraw from the research at any time providing that the researchers are informed of my decision no longer than one month after the completion of data collection. My refusal to participate or withdrawal of consent will not affect my child's teaching and/or personal life.

This study has been reviewed by the Human Research Ethics Committee of the University of Wollongong and the state Education Research Approval Process (SERAP). If I have any questions about the research, I can contact Mrs Carolyn Pogson at _____ or via email at carolyn.pogson@det.nsw.edu.au. If I have any concerns or complaints regarding the way this research is being conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong by telephone at (02) 42214457 or email at rso-ethics@uow.edu.au. By completing the form below I am agreeing to participate in the research.

I _____ consent to (*please tick*):

- My participation in an interview.
- I understand the interview will be video or audio recorded.
- My participation in focus group meetings.
- I understand that some children in my class will participate in a consonant program for 60 minutes a week for 10 weeks.
- I understand that the data collected from my participation will be used for the purpose of providing information that can be used to create better support for children with Australian Aboriginal English backgrounds. Findings from the study may become part of published reports in teacher or educational research journals and I consent for my data to be used in this manner.

Signed: _____

Date: _____

APPENDIX B: Interview questions

SEMI STRUCTURED INTERVIEW: University lecturers

Introduction by interviewer

Thank you for agreeing to participate in this interview. The aim of the interview is for me to learn about your experience, beliefs and knowledge of young Aboriginal children's consonant acquisition. It includes your beliefs about pedagogy, program content and student engagement, as well as, the ways these beliefs would influence your teaching of a consonant program to 5-7 year old Aboriginal children. The information I gather throughout this interview will contribute to the design of a consonant program for 5-7 year old Aboriginal children. Please be assured that anything you say will be treated confidentially and that your name will not be associated with the data when it is reported. Do you have any questions about your participation?

Would you mind if I record your interview to allow me to concentrate on our conversation rather than taking notes? [If yes, start recording. If no, then take hand written notes].

These questions are about you.

- a) Please tell me a little about your professional background.
- b) What expertise do you bring to the university?
- c) Do you currently teach? If yes, what classes do you teach?
- d) Where/What did you teach prior to coming to the university?

These questions are about children learning consonant sounds.

- a) In your opinion is there a relationship between consonant articulation and learning?
- b) Of the many different methods of teaching phonics e.g. Synthetic, analytic and whole language, which method do you think is the most effective and why? (*explain techniques if necessary*).
- c) From your observations, knowledge and experience what have you found to be the best way to teach consonant sounds to young children?
- d) Could you please give an example of this method?
- e) Do you think participation in oro-motor training to learn consonants might be beneficial for children? Please explain...
- f) Do you believe that there are other more effective methods of teaching consonant sounds to young Aboriginal second dialect learners? If so, could you please elaborate on them and give an example of each one.

These questions are about the dialectal differences between AE and SAE.

- a) Are you aware of any differences between AE and SAE, particularly in their phonology?
Please explain
- b) What implications do you think these differences have for teachers?
- c) In your opinion how we should address these implications?

These questions are about pedagogy and engagement with learning consonant sounds.

- a) What do you believe would be the most effective method of delivering a consonant program to 5-7 year old learners and why?
- b) Could you please give an example of this method?
- c) From your observations, knowledge and experience what have you found to be the most effective and culturally appropriate method to teach consonant sounds to young Aboriginal children and why?
- d) Could you please give an example of this method?

1. Based on your knowledge and experience which consonants do you think should be the focus of this program and why?

2. Do you know of anything else that would assist in the program's development?

3. Would you like to continue your involvement in this research and participate in focus group meetings to refine the program?

4. Is there anything you'd like to add?

Thank you for your time and participation in this interview.

SEMI STRUCTURED INTERVIEW: Primary teachers

Introduction by interviewer

Thank you for agreeing to participate in this interview. The aim of the interview is for me to learn about your experience, beliefs and knowledge of young Aboriginal children's consonant acquisition. It includes your beliefs about pedagogy, program content and student engagement, as well as, the ways these beliefs would influence your teaching of a consonant program to 5-7 year old Aboriginal children. The information I gather throughout this interview will contribute to the design of a consonant program for 5-7 year old Aboriginal children. Please be assured that anything you say will be treated confidentially and that your name will not be associated with the data when it is reported. Do you have any questions about your participation?

Would you mind if I record your interview to allow me to concentrate on our conversation rather than taking notes? [If yes, start recording. If no, then take hand written notes].

These questions are about you.

- a) Please tell me a little about your professional background.
- b) What class/classes do you currently teach?
- c) How long have you been teaching kindergarten and Year 1 children?

These questions are about children learning consonant sounds.

- a) Have you noticed a relationship between consonant articulation and learning? Please explain....
- b) From your observations and experience what have you found to be the most productive method to teach consonant sounds to young children?
- c) Could you please give an example of this method?
- d) Do you think that learning the oral positioning of your mouth and vocal movement helps children learn their consonant sounds? Please explain..
- e) How do you teach consonant sounds at the moment?
- f) Do you believe that there are other more effective methods of teaching consonant sounds to young Aboriginal second dialect learners? If so, could you please elaborate on them and give an example of each one.

These questions are about the dialectal differences between AE and SAE.

- a) Are you aware of any difference between AE and SAE, particularly in their sounds?
Please explain
- b) What implications do you think these differences have for teachers?
- c) How do you think this affects the lessons teachers are delivering to Aboriginal children?
- d) In your opinion how should teachers address these implications?

These questions are about pedagogy and engagement with learning consonant sounds.

- a) What do you believe would be the most effective method of delivering a consonant program to 5-7 year old learners and why?
 - b) Could you please give an example of this method?
 - c) From your observations and experience what have you found to be the most effective and culturally appropriate method to teach consonant sounds to young Aboriginal children and why?
 - d) Could you please give an example of this method?
-
1. *Based on your knowledge and experience which consonants do you think should be the focus of this program and why?*
 2. *Do you know of anything else that would assist in the program's development?*
 3. *Would you like to continue your involvement in this research and participate in focus group meetings to refine the program?*
 4. *Do you have anything you would like to add?*

Thank you for your time and participation in this interview.

SEMI STRUCTURED INTERVIEW: Aboriginal community members or Aboriginal Elders

Introduction by interviewer

Thank you for agreeing to participate in this interview. The aim of the interview is for me to learn about your experience and understanding of young Aboriginal children's consonant acquisition. It includes what you believe about how Aboriginal children learn and what consonants Aboriginal children need support in learning. The information I gather throughout this interview will contribute to the design of a consonant program for 5-7 year old Aboriginal children. Please be assured that anything you say will be treated confidentially and that your name will not be associated with the data when it is reported. Do you have any questions about your participation?

Would you mind if I record your interview to allow me to concentrate on our conversation rather than taking notes? [If yes, start recording. If no, then take hand written notes].

These questions are about you.

- a) Please tell me a little bit about your family, particularly about the number of children you have and your relationship to children at this school.
- b) Please tell me a little bit about Aboriginal language and how it is or has been used in your family.

These questions are about Aboriginal children learning sounds.

- a) Do you think there is a link between the way children say sounds and the way they read and write them? Please explain...
- b) Do you believe that learning sounds is an important way to learn to read and write? Why?
- c) From your experience what is the best way to help children learn sounds?
- d) Could you please give an example of how this is done?

These questions are about children's engagement with learning sounds.

- a) What do you *believe* is the most engaging way for Aboriginal children to learn sounds?
- b) From your *experience* raising children and your cultural knowledge do you think Aboriginal children need to be taught sounds differently to the way they are taught at school? If so, how should they be taught?
- c) Could you please give an example?

1. *Based on your knowledge and experience which sounds do you think should be the focus of this program and why?*
2. *Do you know of anything else that would assist in the program's development?*
3. *Would you like to continue your involvement in this research and participate in focus group meetings to refine the program?*
4. *Do you have anything you would like to add?*

Thank you for your time and participation in this interview.

PARENT/CAREGIVER INTERVIEW

Child's Name: _____ Class: _____

Parent/Caregiver's Name: _____

1. How old is your child? _____ years _____ months.
2. What language/s do you speak at home?
3. What language/s can your child speak?
4. Do you remember anyone within your family speaking a different dialect of English?
Can you give more details about this?
5. What nationalities are part of your child's heritage? Can you give more details about this?
6. Please tell me a bit more about your family's background eg. Where they are from.
7. Does your child have any learning difficulties? If yes, please give details.
8. Do you think your child knows all of their sounds? If no please give some details.
9. Does he/she say their sounds accurately? Please give some details about this.
10. Do you think this has an impact on their learning?
11. What do you think teachers can do to further support your child's learning of sounds?

Thank you for participating in this interview. Your support and input is gratefully appreciated.

APPENDIX C: Interview analysis

FINDINGS FROM INTERVIEW THEMES TABLE

1. Is there a relationship between consonant articulation and learning? Yes
(13/15)

- a) Children are influenced by the way they hear sounds (8/15 responses)
- b) The way we say sounds influences their learning of sounds (7/15).
- c) The way we say sounds and the way children hear them influences their letter sound correspondences (learning of) and therefore their learning. (6/15)

2. What do you think is the most effective method to teach consonant sounds?
(*Academics*)

- a) Analytical method where sounds are drawn out of words and put back in, then possibly built up into sentences (put into context) was seen to be the most effective (3/5).
- b) Using something e.g. stories, written text etc. to put them back into context was seen to be important (whole language) (2/5).

3. From your observations and experience what have you found to be the most productive method to teach consonant sounds to young children?

- a) Modelling using your mouth is most effective (11/14).
- b) Saying the sound and the use of letter sound correspondence (7/14).
- c) Sounds used in context with repetition (5/14).

4. Could you give an example of this method?

- a) Identifying and using sounds in words (7/14)
- b) Sensory fun activities such as games, body-based practise, rhythm/chant/rhyme, song (6/14).
- b) Mouth positioning and articulation training (5/14).

5. Do you think that the oral positioning of your mouth and vocal movement helps children learn consonant sounds?

- a) Yes (11/14)
- b) One person said children learn how you teach the sound not necessarily how you hold your mouth.

6. How do you teach consonant sounds at the moment? (*teachers*)

- a) Games and other activities that focus on the sound (3/5)
- b) Modelling (2/5)
- c) Reading letter sound books (decoding and talking about sounds/blends in books) (2/5)

7. Do you believe there are more effective methods of teaching consonant sounds to young Aboriginal second dialect learners? If so, could you please elaborate on them and give an example of each one? (*Teachers & Academics*)

- a) Watch me, look at me, this is how you say it strategies followed by activities to put it into action (visual, auditory, tactile) (4/8)
- b) Something to help them trigger their memory that is fun and physical (sensory) like rhyme, raps, music etc. (4/8)

8. Are you aware of any differences between AE and SAE particularly in phonology?

- a) th = 4/15 b) h = 3/15 c) g, b, d = 2/15 d) t,r,c, sh, z & I know what you know = 1

9. What implications do you think these differences have for teachers?

- a) Teachers need to know more about these differences (3/15)
 b) Teach children that AE and SAE are not better than each other, they are just different, and SAE is used at school (2/15).
 c) Teach sounds more often, clearly and focus on the area of need (2/15).
 d) Aboriginal children and community are different and they think differently. Adjustments need to be made for their differences (2/15).

10. In your opinion how should teachers address these implications?

- a) Gain knowledge and support where ever they can e.g. parents, community, learning support teams, counsellors etc. (4/15)
 b) Teach children that AE and SAE are the same just that SAE is taught at school (3/15).

11. What do you believe would be the most effective/engaging method of delivering a consonant program to young Aboriginal children?

- a) Eight Ways of Learning and tactile (6/15)
 b) Oral language production and awareness (4/15)
 c) Rhyme and song (4/15)
 d) Modelling (3/15)

12. Could you give an example of this method? (*academics and teachers*)

- a) Some awareness activity, model how to make the sound, make the sound, put the sound into words using tactile activities. (All individual responses but generally saying a process like this).

13. What do you think would be the most effective and culturally appropriate method to teach consonant sounds?

- a) Physically engaging, involving practise of sound and change it up to avoid boredom (4/15).
 b) Eight Ways of Learning (Deconstruct- Reconstruct) (4/15)
 c) Involve carers and the community (3/15).

14. Could you give an example of this method?

- a) Awareness strategies (sensory) = 3
 b) Modelling sound = 3
 c) Linking to something to remember = 3
 d) Deconstruct and reconstruct = 2
 e) Use in words = 2
 (Some interesting examples used in the interviews).

15. Based on your knowledge and experience which consonants do you think should be the focus of the program and why?

- a) e = 3/15
 b) t, g, k, d = 2/15

c) Sounds you lift your tongue for n, t, d, s, ch, dʒ, r, l, j, sh, ʒ, ŋ, k, g, x, w = 1/15; ð and h = 1/15; similar sounds like b & d = 1/15; I know what you know = 1/15; work systematically through them all = 1/15

All participants indicated that they needed to work with the sounds they struggled with.

16. Do you know of anything else that would assist in the program's development?

a) Ensure activities are hands on and children get to practise it in a variety of ways e.g. oral, in writing and in reading = 2/15

APPENDIX D: Sociocultural phonological program design framework

Prior to teaching and following teaching:

What is required?	What needs to be done?
<p>Teaching space</p> <p>Knowledgeable, experienced teacher</p>	<p>Meet with the principal and request a quiet space in which to conduct the programme. Ask the principal for time in the timetable for a knowledgeable experienced teacher to teach the program. Five mornings a week (10 hours a week for 10 weeks). (DGP13)</p>
<p>Following the recruitment of voluntary participants assess students using the DEAP assessment.</p> <p>DEAP assessment at end of SPP to determine student progress.</p>	<p>Evaluate the phonemes each individual participant requires in the SPP (DGP 8).</p> <p>Highlight the phonemes that are similar in the child's L1 and L2 so that they can be placed in the SPP teaching sequence together (DGP 5). Highlight phonological differences so they can be used to guide learning (DGP 7)</p>
<p>At the beginning of every lesson a conversation informing the student that their first language is highly valued is necessary.</p>	<p>At the commencement of every lesson within the SPP time will be allocated to this discussion (DGP 9). This discussion should include talking about language. For example, In your language /f/ is not used, /d/ is used instead. Can you tell me a word where this happens? Etc. (DGP 2). Today we are going to learn /f/ to help you at school (DGP 11 – learning from wholes to parts. DGP 1 – Social context with experienced other)</p>

Teaching sequence:

What is required?	What needs to be done?
<p>1. <u>Awareness Teaching (Haptic)</u></p> <p>Teach haptic sequence using modelled and guided techniques, which are highly scaffolded. (DGP 12, DGP 11, DGP 4)</p>	<p>Following the discussion about L1 and L2 and reminders about the importance of a child's L1 teach the haptic technique using modelled and guided processes which are highly scaffolded.</p>
<p>2. <u>Placing the phoneme into context at word level</u></p> <p>Sensory activities to write words containing the focus phoneme. For example, playdough or kinetic sand</p>	<p>Use a variety of sensory activities to assist children to write words containing the focus phoneme. Children should receive support where needed (scaffolding) eg. I'll write 'fog' and you can write 'frog' for example. (DGP 6, DGP 4, DGP 11, DGP 10)</p>
<p>3. <u>Placing the phoneme into context at the sentence level</u></p> <p>Use the words children have used in the previous section and write them into sentences using a variety of media. For example, /f/ in the word 'frog' and the sentence – "Frogs eat flies.</p>	<p>Use a variety of supports eg. whiteboards, word cards, letter tiles etc to allow children to write the words they used in the previous section into sentences (DGP 6, DGP 11, DGP 4)</p>
<p>4. <u>Revise the phoneme using word and sentence games</u></p>	<p>Use a range of fun games and activities to revise the target phoneme (DGP 3, DGP 11, DGP 4)</p>

APPENDIX E: Approval letters



APPROVAL LETTER

In reply please quote: HE15/004

2 October 2015

Dr Amanda Baker
 School of Education
 Building 67
 University of Wollongong

Dear Dr Baker,

Thank you for your response dated 21 September 2015 to the HREC review of the application detailed below. I am pleased to advise that the application has been approved.

Ethics Number: HE15/004

Project Title: Development of a sociocultural program to support young
 Indigenous children's consonant production

Researchers: Dr Amanda Baker, Dr Michelle Eady, Mrs Carolyn Pogson

Documents Approved: 1. SERAP application v. 2 dated 30 June 2015

2. Letter of Support Wollondilly AECG dated 16 September 2015

3. Appendix 1: Research Instrument: Diagnostic Evaluation of

Articulation and Phonology Assessment v.2 dated 30 June 2015

4. Appendix 2: Letter to the Principal v.2 dated 30 June 2015

5. Invitation Letter for Teachers v.2 dated 30 June 2015

6. Invitation Letter for Parents/ Caregivers v.2 dated 30 June 2015

7. Appendix 3: Participant Information for Principals v.2 dated 30

June 2015

8. Participant Information for Teachers v.2 dated 30 June 2015

9. Participation Information for Parents and Caregivers v.2 dated 30

June 2015

10. Parent/ Caregiver Consent Form v.2 dated 30 June 2015

11. Teacher Consent Form v.2 dated 30 June 2015

Approval Date: 25 September 2015

Expiry Date: 24 September 2016

Ethics Unit, Research Services Office
 University of Wollongong NSW 2522 Australia
 Telephone (02) 4221 3386 Facsimile (02) 4221 4338
 Email: rso-ethics@uow.edu.au Web: www.uow.edu.au

The University of Wollongong/Illawarra Shoalhaven Local Health District Social Sciences HREC is constituted and functions in accordance with the NHMRC *National Statement on Ethical Conduct in Human Research*. The HREC has reviewed the research proposal for compliance with the *National Statement* and approval of this project is conditional upon your continuing compliance with this document.

Approval by the HREC is for a twelve month period. Further extension will be considered on receipt of a progress report prior to expiry date. Continuing approval requires:

- The submission of a progress report annually and on completion of your project. The progress report template is available at <http://www.uow.edu.au/research/ethics/human/index.html>. This report must be completed, signed by the researchers and the appropriate Head of Unit, and returned to the Research Services Office prior to the expiry date.
- Approval by the HREC of any proposed changes to the protocol including changes to investigators involved
- Immediate report of serious or unexpected adverse effects on participants
- Immediate report of unforeseen events that might affect continued ethical acceptability of the project.

If you have any queries regarding the HREC review process, please contact the Ethics Unit on phone 4221 3386 or email rso-ethics@uow.edu.au.

Yours sincerely,

Associate Professor Melanie Randle

Chair, UOW Social Sciences

Human Research Ethics Committee



Mrs Carolyn Pogson

CORP15/2531

DOC15/758667

SERAP 2014274

Dear Mrs Pogson

I refer to your application to conduct a research project in NSW government schools entitled *Development of a sociocultural program to support young Indigenous children's consonant production*. I am pleased to inform you that your application has been approved.

You may contact principals of the nominated schools to seek their participation. **You should include a copy of this letter with the documents you send to principals.**

This approval will remain valid until 24-Sep-2016.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Researcher name	WWCC	WWCC expires
Carolyn Dorothy Pogson	APP0075465	01-Aug-2018

I draw your attention to the following requirements for all researchers in NSW government schools:

- The privacy of participants is to be protected as per the NSW Privacy and Personal Information Protection Act 1998.
- School principals have the right to withdraw the school from the study at any time. The approval of the principal for the specific method of gathering information must also be sought.
- The privacy of the school and the students is to be protected.

- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the research approvals officer before publication proceeds.
- All conditions attached to the approval must be complied with.

When your study is completed please email your report to: serap@det.nsw.edu.au
You may also be asked to present on the findings of your research.

I wish you every success with your research.

Yours sincerely



Dr Robert Stevens

Manager, Research/Quality Assurance

7 October 2015

Policy, Planning and Reporting Directorate

NSW Department of Education

Level 1, 1 Oxford Street, Darlinghurst NSW 2010 – Locked Bag 53, Darlinghurst NSW
1300

Telephone: 02 9244 5060 – Email: serap@det.nsw.edu.au



Wollondilly AECG

16 September 2015

Carolyn Pogson
Assistant Principal
Tahmoor Public School
Tahmoor NSW 2573

Email: CAROLYN.POGSON@det.nsw.edu.au

Re: Research Project

At the last meeting of the local Wollondilly AECG held on 10 August 2015, you outlined your Research project on Aboriginal Language entitled "Development of a Sociocultural Program to Support Young Aboriginal Children's Consonant Production" with the University of Wollongong. The AECG formally endorses and supports your project. The local AECG welcomes any updates you may like to provide during the course, or at the conclusion of your project.

Regards

Janny Ely
Megan Ely

Lynette Barrett-Flynn

Executive
Wollondilly AECG

DGP 8 – DEAP assessment before program implementation and on completion of the program.
Formative assessment throughout program through strategic questioning, student pronunciation assessment and analysis of work/games.

DGP 7
DGP 5

APPENDIX F: Sociocultural phonological program (SPP)

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
Lesson 1 Week 4 Mon	/θ=/'th' (voiceless)	/t, b, d, p/	<p>1. Remind children that we use these sounds to learn at school and that they may be different to how you say things at home. Tell them about the lesson and why you are teaching it (Do this at the beginning of every lesson). Then check the child's pronunciation of the sound in the three places (initial, medial and final) by giving them picture cards to say the sound. Eg. three, teeth, toothbrush.</p> <p>2. If they are having problems saying it in any of the positions or transferring it from one position to another (It is easier to assist if they can say it but not transfer it) move on to step 3.</p> <p>3. Brush the tip of the tongue 3 times with the craft stick.</p> <p>4. Stick the tip of the tongue out and touch the craft stick 3 times.</p> <p>5. Repeat step 3.</p> <p>Repeat step 4 while blowing out 3 times.</p>	<p>Sample words: three, thick, thin, throne, thumb, thongs, throw, teeth, with, toothbrush.</p> <p>1. Create the word 'tooth' using letter tiles and sound it out when complete.</p> <p>2. Use picture cues to read sample words.</p>	<p>Sample: A thick toothbrush was on the bath.</p> <p>1. Child makes a word one using /θ/ (unvoiced) and letter tiles.</p> <p>2. Together the teacher and student create a picture of the word and place it on the wall as a reminder of the phoneme.</p> <p>3. Write the sample sentence and read it to the student.</p> <p>4. With assistance he/she writes the word into a sentence using a small white board and marker.</p> <p>3. Read the sentence together.</p> <p>4. Assist the student to write the sentence into their book and illustrate it.</p>	DGP 4

DGP 1 & 4 are throughout the whole program. Starting here

DGP 11

DGP 12

DGP 6

DGP 13 Is not written into the program as it is the person who implements the program

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
	<div style="border: 1px solid black; padding: 2px;"> DGP 5 DGP 7 </div>		<p>6. Place your hand horizontally in front of your mouth (just touching your lips), say /θ/, and feel your breath (your tongue should just touch your hand as you do this). Do this 3 times.</p> <p>7. Place your hand vertically in front of your mouth and say the sound in words following the positions (3 times each word. Mouth to feel breath to hand). Top left - think /ɪ/, bottom right - thought /o:/, bottom left - thank /æ/.</p> <p>8. Brush the tip of the tongue 3 times with the craft stick.</p> <p>9. Stick the tip of the tongue out and touch the craft stick 3 times.</p> <p>10. Place your hand vertically in front of your mouth and say the sound in words following the position (3 times each word. Mouth to feel breath to hand) Top left - think /ɪ/, bottom right - thought /o:/, bottom left - thank /æ/.</p>	<div style="border: 1px solid black; padding: 2px; margin-left: 100px;"> DGP 10 </div> <div style="border: 1px solid black; padding: 2px; margin-left: 100px;"> DGP 9 DGP 2 </div>		

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
	<p>DGP 12 DGP 11</p>		<p>sound using the sound cards (three, teeth, toothbrush).</p> <p>2. If the child is using an approximation of the sound ask them to say three, teeth and toothbrush again with their hand against their lips to feel breath and their tongue when pronouncing the words. If needed revise using awareness/teaching process from Monday Week 4.</p> <p>3. If they are still having difficulty use Ipad ap ‘Speech Sounds 4 Kids’ to revise sound.</p>	<p>1. <u>Play Picture card dictation</u>. Show children a picture and they need to tell you about everything they can see. Demonstrate using different card. For example; The queen, who is wearing thongs, is sitting on the throne with three toothbrushes.</p> <p>DGP 10</p>	<p>DGP 3 DGP 5 DGP 7</p>	<p>d, p/ Person with most correct wins.</p>
<p>Lesson 4 Week 4 Fri</p>	<p>/f/</p> <p>DGP 2 DGP 9</p>	<p>/t, b, d, p/ And /θ/ (voiceless)</p> <p>DGP 5 DGP 7</p>	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Explain to the children that we are going to look at the /f/ sound because we tend to use it instead of / θ/ (voiceless). Remind them of how to say /θ/ and move on to teaching /f/.</p> <p>2. Check that children know the sound in the initial, medial and final positions. Ask them to say ‘fish, raft’ and ‘cliff’.</p>	<p><u>Sample words:</u> Fit, fun, flat, fan, fish, five, freckles, face, raft, lift, sniff, cliff</p> <p>1. Create the word fan using kinetic sand and sound it out when complete.</p> <p>2. Use picture cues to read sample words.</p>	<p><u>Sample:</u> He had five freckles on his face.</p> <p>1. Child makes a word using the /f/ sound using magnetic letters.</p> <p>2. Place a picture of the word he/she made on the wall as a reminder of the phoneme. Discuss. For example, fish starts with a /f/ sound.</p>	

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
			<p>3. If they are having problems saying it in any of the positions or transferring it from one position to another (It is easier to assist if they can say it but not transfer it) move on to step 4. If they can say it move to revision activities.</p> <p>4. <u>Physical awareness</u>: Brush the lip where dry and then where wet 3 times with the paddle pop stick. Emphasise the line where they meet.</p> <p>5. Touch teeth to the line and blow out 3 times.</p> <p>6. Place your hand horizontally in front of your mouth, touch teeth to the line and blow out 3 times.</p> <p>7. Place your hand horizontally in front of your mouth and say the sound in words following the position (3 times each word. Mouth to feel breath to hand) Top left - fee /i:/, top right – for /o:/, bottom right – fun /ʌ/, bottom left – fight /aɪ/</p> <p>8. Brush the lip where dry and then where wet 3 times with the paddle pop stick. Emphasise the line where they meet.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> DGP 12 DGP 6 DGP 11 </div>	<p>3. Write the sample sentence and read it to the student.</p> <p>4. With assistance he/she writes the word they created into a sentence using the small whiteboard and marker.</p> <p>5. Read the sentence together.</p> <p>6. Assist the student to write the sentence into their book and illustrate it</p>	

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
			<p>9. Touch teeth to the line and blow out 3 times.</p> <p>10. Place your hand vertically in front of your mouth, touch teeth to the line and blow out 3 times.</p> <p>11. Place your hand vertically in front of your mouth and say the sound in words following the position (3 times each word. Mouth to feel breath - to hand). Top left - fee /i:/, top right – for /o:/, bottom right – fun /ʌ/, bottom left – fight /aɪ/</p>			
Lesson 5 Week 5 Mon	/f/	/θ=/'th' (voiceless) /t, b, d, p/	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Revise pronunciation of the sound using the sound cards (fish, cliff and raft).</p> <p>2. If the child is using an approximation of the sound ask them to say the sound again with their hand against their lips to feel breath and their teeth on the line</p>	<p><u>Sample words:</u> Fit, fun, flat, fan, fish, five, freckles, face, raft, lift, sniff, cliff</p> <p>1. Child makes a new /f/ word using playdough and sounds it out when complete. They articulate the word correctly in a sentence of their own.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> DGP 3 DGP 10 DGP 6 </div>	<p>1. Play a <u>rhyme game</u> eg. How fast can you say – Fred fishes with five freckled friends on Friday?</p>

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
	DGP 12 DGP 5 DGP 11		<p>between the wet part and the dry part of their lips when pronouncing the words.</p> <p>3. If they are still having difficulty repeat the awareness/teaching process from Friday Week 4 (above). If not revision activities of target phonemes.</p>	<p>2. Read an Indigenous Reader containing the /f/ phoneme.</p>	<p>DGP 3 DGP 6 DGP 10 DGP 10 DGP 6</p>	
Lesson 6 Week 5 Tues	/f/ Revision DGP 9 DGP 2 DGP 7 DGP 5	/t, b, d, p/ /θ/= 'th' (voiceless)	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Revise pronunciation of the sounds using the sound cards (fish, cliff, raft).</p> <p>2. If the child is using an approximation of the sounds ask them to say the sounds again with their hand against their lips to feel breath and be aware of where their teeth and tongue should be when pronouncing the words (remind them of each one as needed). Repeat haptic process from Lesson 4 if needed.</p>	<p><u>Sample words:</u> Fit, fun, flat, fan, fish, five, freckles, face, raft, lift, sniff, cliff</p> <p>1. Play <u>Snap</u> using pictures, phonemes and words. Use the following phonemes: /f, t, b, d, p/.</p> <p>DGP 12 DGP 11</p>	<p>DGP 3 DGP 10 DGP 6 DGP 7</p>	<p>1. Play <u>Trash or Treasure</u> (Trash being nonsense words and treasure being real words. Use cards with pictures and words for /t, d, p/. Person with most correct wins.</p>

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
			3. If they are still having difficulty use Ipad ap ‘Speech Sounds 4 Kids’ to revise the sound/s.			
Lesson 7 Week 5 Thurs	/f/ and /θ/ ‘th’ (voiceless) revision	/f/ /θ/ ‘th’ (voiceless) /t, b, d, p/	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Revise pronunciation of the sounds – /f/ and /θ/ (voiceless) cards (fish, cliff, raft, three, teeth, toothbrush).</p> <p>2. If they are still having difficulty use the placement of their teeth and tongue and how the air on their hand feels when producing /θ/ (unvoiced) and /f/. Repeat haptic process from Lesson 4 and 1 if needed. Then use the Ipad ap ‘Speech Sounds 4 Kids’ to revise sounds.</p>	<p><u>Sample words:</u> three, thick, thin, throne, thumb, thongs, throw, teeth, with, toothbrush, Fit, fun, flat, fan, fish, five, freckles, face, raft, lift, sniff, cliff</p> <p>1. Say /f/ and /θ/ in a sentence.</p> <p>2. Play <u>memory</u> using Ipad and the sounds /θ/ (unvoiced) and /f/.</p>	<p>DGP 3 DGP 11 DGP 6</p> <p>DGP 10</p> <p>DGP 12 DGP 11 DGP 5</p>	<p>Play <u>Rhyming game</u> with a hat using /θ/ and /f/. Include revision phoneme pictures as needed.</p> <p>DGP 3 DGP 11 DGP 6</p>
DGP 9 DGP 2 DGP 7						
Lesson 8 Week 5 Fri	/ð/ ‘th’ (voiced)	/f, ð t, b, d, p/	1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). There are few words with /ð/ in the final or medial position so	<u>Sample words:</u> the, then, that, them, feather	<u>Sample:</u> “Please take that over to them,” said mum.	DGP 3 DGP 11 DGP 6
DGP 9 DGP 2 DGP 7 DGP 5						

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
			<p>check children know the sound in the initial position. For example, ‘<u>the</u> box’. If having trouble move to step 2.</p> <p>2. <u>Physical awareness</u>: Brush the tip of the tongue 3 times with the paddle pop stick lightly. (stress the lightly)</p> <p>3. Stick the tip of the tongue out and touch the paddle pop stick 3 times.</p> <p>4. Brush the tip of the tongue 3 times with the paddle pop stick lightly. (stress the lightly)</p> <p>5. Place one hand on your voice box (front of throat), place the paddle pop stick vertically against your lips, and remembering to place your tongue on your top front teeth and pull it back as you say /ð/ 3 times. Discuss what you feel your voice box do.</p> <p>6. Place one hand on your voice box (front of throat), place your other hand vertically against your lips, and remembering to place your tongue touch your hand and pull it back as you say /ð/ 3 times. Discuss what you feel your voice box do and did your feel your tongue on your hand?</p> <p>7. Place your hand on your voice box (front of throat) and say the sound in words following the position (3 times</p>	<p>1. Create a sample word then using kinetic sand and sound it out when complete.</p> <p>2. Place a picture of the word he/she made on the wall as a reminder of the phoneme. Label it eg. ‘<u>That</u> ball’.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> DGP 12 DGP 11 </div>	<p>1. Write the sample sentence and read it to the student.</p> <p>4. With assistance he/she writes the word they created into a sentence using the small whiteboard and marker.</p> <p>5. Read the sentence together.</p> <p>6. Assist the student to write the sentence into their book and illustrate it</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> DGP 10 </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> DGP 6 </div>

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
			<p>each word. Mouth to feel breath - to hand). Top left - the /i:/, top right – thought /o:/, bottom left – that /æ/</p> <p>8. Brush the tip of the tongue 3 times with the paddle pop stick lightly. (stress the lightly)</p> <p>9. Stick the tip of the tongue out and touch the paddle pop stick 3 times.</p> <p>10. Place your hand on your voice box (front of throat) and say the sound in words following the position (3 times each word. Mouth to feel breath to hand) Top left - the /i:/, top right – thought /o:/, bottom left – that /æ/</p>			

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation techniques (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
Lesson 9 Week 6 Mon	/ð/ 'th' (voiced)	/f/ /ð, t, b, d, p/	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Revise pronunciation of the sound using the sound cards.</p> <p>2. If the child is using an approximation of the sound ask them to say 'the', 'that' and 'feather' again with their hand against their voice box to feel vibration when pronouncing the words.</p> <p>3. If they are still having difficulty repeat the awareness/teaching process from Friday Week 5 (above).</p>	<p><u>Sample words:</u> the, then, that, them, feather</p> <p>1. Child makes a /ð/ word that is different to the word created on Friday using playdough and sounds it out when complete. Child then articulates it accurately in a verbal sentence.</p> <p>2. Read an Indigenous Reader containing the /ð/ phoneme.</p>	<p>DGP 3</p> <p>DGP 10 DGP 6</p>	<p>1. Thumbs Up? Thumbs Down? using revision phoneme words and /ð/ words.</p>
Lesson 10 Week 6 Tues	/ð/ 'th' (voiced)	/f/ /ð, t, b, d, p/	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Revise pronunciation of the sound.</p>	<p><u>Sample words:</u> the, then, that, them, feather</p> <p>1. Play a speed game eg. How fast can you say all</p>	<p>DGP 3</p>	<p>1. Play <u>Snap</u> using pictures, phonemes and words. Use the following phonemes: /θ/, /ð/ and /f/. Include /t, b, d, p/ where extension is needed.</p>

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DGP 12
DGP 11

DGP 9
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			<p>2. If the child is using an approximation of the sound ask them to say ‘them’, ‘that’, ‘the’ and ‘feather’ again with their hand against their throat to feel the vibration of their voice box when pronouncing the words.</p> <p>3. If they are still having difficulty remind them of how to feel the sound using their hands on their voice box and repeat the awareness/teaching process from Friday Week 5 (above). Then use Ipad ap ‘Speech Sounds 4 Kids’ to revise sound.</p>	<p>the sample words? Time it to find a winner.</p>			
			<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> DGP 12 DGP 11 DGP 10 </div>				
Week	20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation techniques (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
Lesson 11 Week 6 Thur	/ð/ ‘th’ (voiced) /θ/ ‘th’ (voiceless)	/f/ /θ/ ‘th’ (voiceless) /ð/ ‘th’ (voiced) /t, b, d, p/	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Revise pronunciation of the sounds – /f/, /θ/ and /ð/.</p> <p>2. If they are still having difficulty use the way the voice box feels and how the air on their hand feels when producing /ð/ voiced and /θ/unvoiced. Revise</p>	<p>1. Say /f, θ/ and /ð/ in a sentence.</p> <p>2. Play <u>memory</u> using ipad and the sounds /ð/ and /θ/, along with /f/ and /d/.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> DGP 3 </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> DGP 6 </div>	<p>Play Rhyming game with a hat using /θ, ð/ and /f/ Include revision phoneme pictures as needed.</p> <p>Include /t, b, d, p/ where extension is needed.</p>	

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			haptic approaches if needed. Then use the Ipad ap 'Speech Sounds 4 Kids' to revise sound.	DGP 12 DGP 11 DGP 10		
Week	Focus teaching sound	Phonemes to be revised	1.	2.	3.	4.
20 min sessions			Awareness and teaching pronunciation techniques (Haptic)	Phoneme into context (word) with activity	Sentence creation using word containing phoneme	Mixed phoneme/word revision game
Lesson 12 Week 6 Fri	/v/	/f/ /θ/ 'th' /ð/ 'th' /t, b, d, p/	<p>1. Firstly, remind children that we use these sounds to learn at school and that they may be different to how you say things at home. (Do this at the beginning of every lesson). Check that children know the sound in the initial, medial and final positions. Ask them to say 'vase', 'vivid' and 'halve' (show them pictures of each item).</p> <p>2. If they are having problems saying it in any of the positions or transferring it from one position to another (It is easier to assist if they can say it but not transfer it) move on to step 3.</p> <p>3. <u>Physical awareness</u>: Brush the lip where dry and then where wet 3 times with the paddle pop stick. Emphasise the line where they meet.</p> <p>4. Touch teeth to the line and blow out 3 times.</p> <p>5. Place your hand on your voice box (front of throat), touch teeth to the line and blow out 3 times.</p>	<p><u>Sample words</u>: vase, vet, vine, violin, vest, velvet, vivid, visit, van</p> <p>1. Create the word 'vet' using letter tiles and sound it out when complete.</p> <p>2. Use picture cues to read sample words.</p>	<p><u>Sample</u>: There were five violets in every vase.</p> <p>1. Child makes 1 or 2 words one using /v/ and letter tiles.</p> <p>2. Together the teacher and student create a picture of the word/s used and place it on the wall as a reminder of the phonemes. While doing this revise the sounds already on the wall by pronouncing each picture/word.</p>	
				DGP 12 DGP 11 DGP 10		

			<p>Place your hand on your voice box, teeth on the line, and say the sound in words following the position (3 times each word. Mouth to feel breath to hand). Top left - veal /i:/, top right – voom /o:/, bottom right – vote /ɔɪ/, bottom left – vile /aɪ/</p> <p>6. Physical awareness: Brush the lip where dry and then where wet 3 times with the paddle pop stick. Emphasise the line where they meet.</p> <p>7. Physical awareness: Touch teeth to the line and blow out 3 times.</p> <p>8. Physical awareness: Place your hand horizontally in front of your mouth, touch teeth to the line and blow out 3 times.</p>		<p>3. Write the sample sentence and read it to the student.</p> <p>4. With assistance he/she writes the words they created into a sentence using a small white board and marker.</p> <p>5. Read the sentence together.</p> <p>6. Assist the student to write the sentence into their book and illustrate it</p>	<p>DGP 6</p>	
Week	20 min sessions	Focus teaching sound	Phonemes to be revised	1.	2.	3.	4.
			Awareness and teaching pronunciation techniques (Haptic)	Phoneme into context (word) with activity	Sentence creation using word containing phoneme	Mixed phoneme/word revision game	

Week 20 min sessions	Focus teaching sound	Phonemes to be revised	1. Awareness and teaching pronunciation techniques (Haptic)	2. Phoneme into context (word) with activity	3. Sentence creation using word containing phoneme	4. Mixed phoneme/word revision game
Lesson 13 Week 7 Mon	/v/	/f/ /θ/ 'th' (voiceless) /ð/ 'th' (voiced) /t, b, d, p/	<p>1. Revise pronunciation of the sound using the sound cards.</p> <p>2. If the child is using an approximation of the sound ask them to say 'vase', 'vivid' and 'halve' again with their hand against their voice box to feel vibration when pronouncing the words.</p> <p>3. If they are still having difficulty repeat the awareness/teaching process from Friday Week 6 (above). Then use the Ipad ap 'Speech Sounds 4 Kids' to revise sound.</p>	<p><u>Sample:</u> There were five violets in every vase.</p> <p>1. Child makes 1 or 2 words one using /v/ and letter tiles.</p> <p>2. Together the teacher and student revise the word with picture on the wall from last week. While doing this revise the sounds already on the wall by pronouncing each picture/word and using in sentence.</p>	<p>1. Child makes a /v/ word that is different to the word created on Friday using playdough and sounds it out when complete. Child then articulates it accurately in a verbal sentence.</p> <p>2. Read an Indigenous Reader containing the /v/ phoneme.</p>	<p>Play <u>Snap</u> using the sample phonemes and words for /f, m, n, t, v/ and /ŋ/.</p>

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DGP 10

<p>Lesson 14 Week 7 Tues</p>	<p>/v/ /f/ /θ=/'th' (voiceless) /ð=/'th' (voiced) /t, b, d, p/</p>	<p>DGP 9 DGP 2</p>	<p>1. Revise pronunciation of the sound using the sound cards. 2. If the child is using an approximation of the sound ask them to say 'vase', 'vivid' and 'halve' again with their hand against their voice box to feel vibration when pronouncing the words. 3. If they are still having difficulty repeat the awareness/teaching process from Friday Week 6 (above). Then use the Ipad ap 'Speech Sounds 4 Kids' to revise sound.</p>	<p>Sample words: vase, vet, vine, violin, vest, velvet, vivid, visit, van 1. Play <u>Snap</u> using pictures, phonemes and words. Use the following phonemes: /v, f, θ, ð/.</p> <p>DGP 12 DGP 11 DGP 10</p>	<p>1. Child articulates and /v/ word and places it in a verbal sentence. Using a white board or magnetic letters the student works together with the teacher to create the sentence.</p>	<p>1. <u>Thumbs Up? Thumbs Down?</u> using revision phoneme words and /v/ words.</p> <p>DGP 6 DGP 3 DGP 10</p>
<p>Week 20 min sessions</p>	<p>Focus teaching sound</p>	<p>Phonemes to be revised</p>	<p>1. Awareness and teaching pronunciation techniques (Haptic)</p>	<p>2. Phoneme into context (word) with activity</p>	<p>3. Sentence creation using word containing phoneme</p>	<p>4. Mixed phoneme/word revision game</p>
<p>Lesson 15 Week 7 Thurs</p>	<p>/v/ /f/ /θ/'th' (voiceless) /ð/'th' (voiced) /t, b, d, p/</p>	<p>/v, f/ /θ/'th' (voiceless) /ð/'th' (voiced) /t, b, d, p/</p>	<p>1. Revise pronunciation of the sound using the sound cards. 2. If the child is using an approximation of the sound ask them to say 'vase', 'vivid' and 'halve' again with their hand against their voice box to feel vibration when pronouncing the words. Also revise: the, then, that, them, feather, three, thick, thin, throne, thumb, thongs, throw, teeth, with, toothbrush, Fit, fun,</p>	<p>1. Child brainstorms /v, f, θ/ and /ð/ ('th' both voiced and unvoiced) words (with support).</p> <p>DGP 12 DGP 11 DGP 10</p>	<p>1. Say /v, f, θ/ and /ð/ in a sentence or sentences. 2. Play <u>memory</u> using Ipad and the sounds</p> <p>DGP 6 DGP 3 DGP 10</p>	<p>1. Play <u>Trash or Treasure</u> (Trash being nonsense words and treasure being real words. Use cards with pictures and words for /v, f, θ/ and /ð/. Person with most correct wins. Child may select game to revise sounds if teacher permits.</p>

			<p>flat, fan, fish, five, freckles, face, raft, lift, sniff, cliff.</p> <p>3. If they are still having difficulty repeat the awareness/teaching process from Friday Week 6 (above). Then use the ipad ap ‘Speech Sounds 4 Kids’ to revise sound.</p>			
Lesson 16			DEAP ASSESSMENT			
Week 7 Fri	<p>DGP 8 – DEAP assessment before program implementation and on completion of the program. Formative assessment throughout program through strategic questioning, student pronunciation assessment and analysis of work/games.</p>					

