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The Spelling Detective Project: A Year 2 Explicit Instruction Spelling Intervention

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Abstract. Teaching spelling is controversial because teaching approaches vary considerably in the contemporary classroom. Teachers may privilege visual over linguistic strategies, select words based around themes or let students choose spelling words, rather than focus on the explicit teaching of phono-morphological structures of words. A nine-week intervention spelling project that included the phono-morphological structure of words and contextualised sentence dictation was designed to support Year 2 students in a NSW school and is described here. The intervention aimed to support all students including those with learning difficulties and an English as an Additional Language (EALD) background, within a mainstream setting. The high-impact instruction was cumulative in design; it provided simple to more difficult target spellings; massed practice during instruction; distributed practice during generalisation; editing and dictation tasks; and continuous formative and summative assessment. Post-sentence dictation results showed that the students who received the intervention had improvements with modest to strong effect sizes.

Introduction

The purpose of this paper is to describe and justify a spelling intervention for primary aged students. Lack of fluent spelling can affect the development of reading and writing competence, leading to long-term personal and social issues (Graham & Perin, 2007; Joshi, Treiman, Carreker, & Moats, 2008; Schlagal, 2013). In addition, correct spelling is greatly valued by society (Moats, 2006). The potential seriousness of poor spelling outcomes is stated in the NAPLAN Standards Results and Reports (ACARA, 2018). ACARA notes that those students performing at Band 2, the national minimum standard, are likely to require additional assistance in order to reach their potential. Those students “who are below the national minimum standard have not achieved the learning outcomes expected for their year level. They are at risk of being unable to progress satisfactorily at school without targeted intervention” (ACARA, 2018, para. 5).

Learning to spell is a linguistic undertaking (Joshi et al., 2008), not just a rote task of memorising letters and words (Moats, 2010). “It requires students to develop the knowledge about oral sounds and written patterns in language” (Joshi et al., 2008, p. 7) and to develop knowledge about the alphabetic principle and combinations of the 26 letters. Spelling researchers (Henry, 2010; Joshi et al., 2008; Moats, 2010; Treiman, 2017, 2018; Westwood, 2018) propose that students of all ability levels need a program of well-sequenced linguistic spelling instruction based on a word level spelling development progression. Such a progression is seen as vital, with each step a building block for the next. Researchers

(Berninger & Richards, 2002; Henry, 2010; Joshi et al., 2008; Moats, 2010) stress that without such an approach, students can be at risk of hindering their word level spelling developmental progression which is necessary to support the more complex aspects of English spelling in the middle and upper primary grades.

Spelling is a visual depiction of spoken word level language (Garcia, Abbott, & Berninger, 2010) and “draws on multiple knowledge sources including the phonological sounds patterns in spoken words, orthographic letter patterns in written words, and morphological word form patterns (base words and affixes) in spoken and written words” (Garcia et al., 2010, p. 63). Berninger, Abbott, Nagy, and Carlisle (2010) emphasised that these three kinds of linguistic awareness grow the most during the primary school years and as a result, made the case that “all three kinds of linguistic awareness that are growing during the primary grades need to be coordinated and applied to literacy learning” (Berninger et al., 2010, p. 141). Therefore, the aim of the intervention was to develop three kinds of linguistic awareness simultaneously and grow students’ understanding of the spelling system and its relationship between speech and the printed word.

The School Context

The Principal and teachers in the intervention school reported poor student progress in spelling development and consequently the outcomes expected at Year 2 level. Over the previous five years, the school had consistently experienced low Year 3 National Assessment Program Literacy and Numeracy (NAPLAN) spelling outcomes. For example, in 2016, 23% of students scored in the national minimum standard of Band 2 (NSW state average was 7.5%) and 4% scored in Band 1 (NSW state average was 3.5%) which is below the minimum standard. This is concerning not only for these students’ current spelling outcomes, but for their long-term literacy development. The aim of the school executive was to address this issue, commencing with implementing a research-based spelling intervention project.

The school had adopted a constructivist approach to teaching literacy that reflected the *New South Wales Literacy and Numeracy Strategy* (New South Wales Department of Education and Communities, 2017). The morning literacy routine of one and a half hours comprised 20 minutes of silent reading, 20 minutes of sustained silent writing and 50 minutes of reading and writing activities including conferencing and data collection (running records). Where spelling was concerned, one of the two Year 2 teachers taught spelling using a commercial program whilst the other taught it on an as needs basis. However, as previously stated, low NAPLAN spelling outcomes were concerning; therefore, the Principal welcomed a well-researched and structured approach using effective instruction. In consultation, it was decided that the intervention project would integrate a Key Learning Area (KLA) to both complement and strengthen the school’s existing pedagogical practices. The importance of continuing to engage schools in research that married professional development with day-to-day teaching methods that support optimum student outcomes for students of all ability levels was viewed as important (Carnine et al., 2006; Coyne et al., 2002; Henry, 2010; Moats, 2010).

This paper presents a description of the intervention project, the Spelling Detective Project, implemented in the school. The detective theme was adopted from a study conducted by Bowers and Kirby (2010) to enhance motivation and foster problem-solving spelling strategies. The detailed results of the intervention are reported elsewhere (Robinson-Kooi, 2019). The nine-week spelling project, including 35 scripted lessons was a bespoke intervention program designed for the Year 2 children in the school. The design and delivery of the intervention was based on high impact instruction (Carnine, Silbert, Kame’enui, Tarver

& Jungjohann, 2006; Coyne, Kame'enui & Carnine, 2011) while the content was from the *Australian Curriculum English (AC: E)* (ACARA, 2013) and the *English K-10 Syllabus* (Board of Studies NSW, 2012). It is important to note that whilst a bespoke program was designed for this school, the elements of the curriculum design process (see Figure 1) could be used in any school to optimise word spelling development for students of all ability levels.

Ethics

Research approval was obtained from the Human Rights Ethics Committee of Edith Cowan University (Project Number 17128) and the participants involved.

The Project Design

The Project Structure and Content

The Project comprised two main components. These were: a) a word level spelling progression that aligned with the *Australian Curriculum: English* and *NSW English K-10 Syllabus* (Board of Studies, 2012) requirements that formed the spelling content; and b) the explicit instruction (EI) teaching approach reflecting scientific evidence based practices that best support student outcomes that formed the pedagogical structure. The structure and design as well as the weekly cycle used strategies aimed to support all students including those with learning difficulties and from an English as an Additional Language or Dialect (EALD) language background, within a mainstream class setting. A concept map containing the elements of the curriculum design process is provided in Figure 1. The high-impact instruction was cumulative in design; it provided simple to more difficult target spellings; massed practice during instruction; distributed practice during generalisation; editing and dictation tasks; and continuous formative and summative assessment (Hollingsworth & Ybarra, 2009, 2018; Rosenshine, 2012).

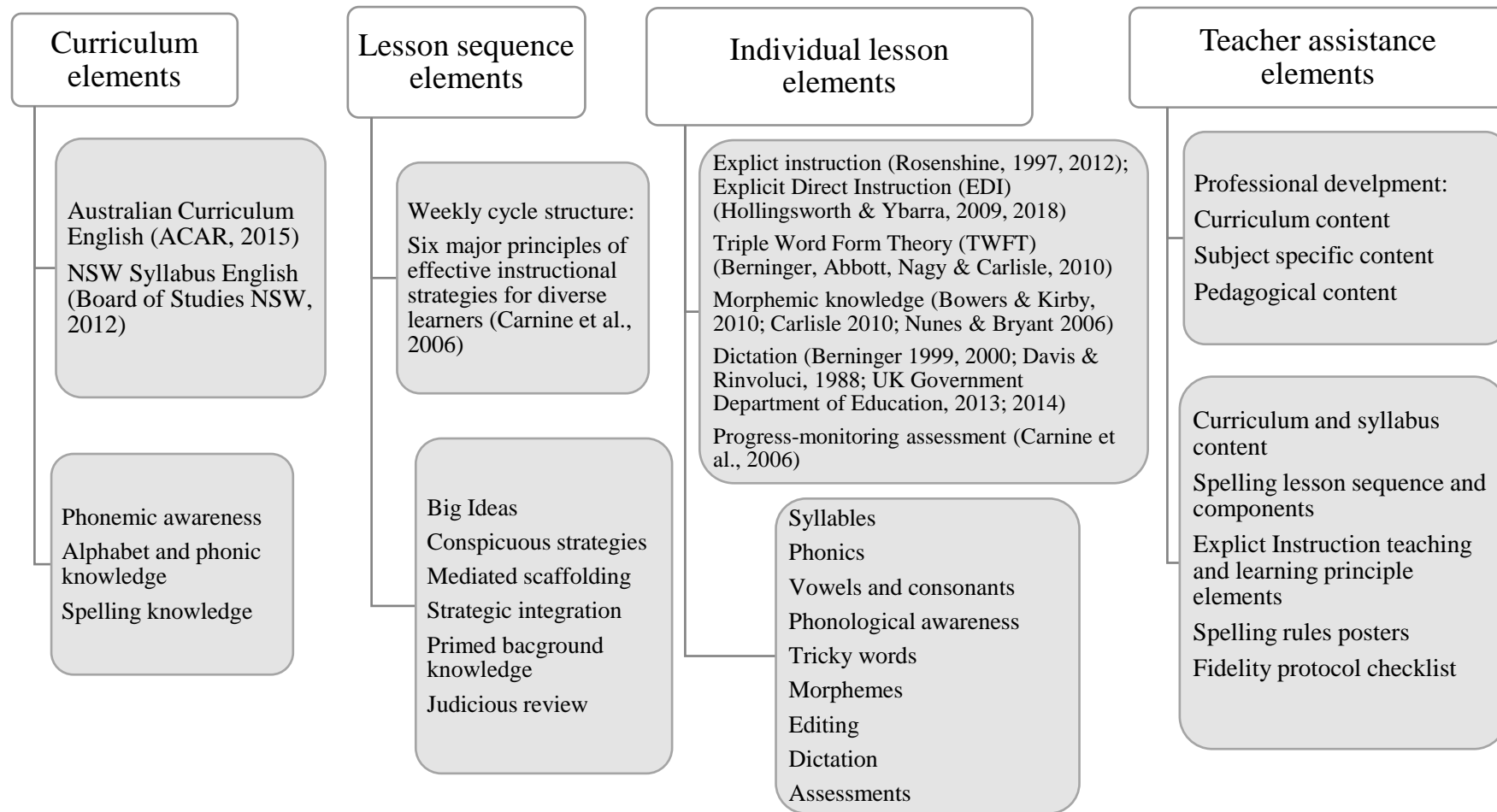


Figure 1. Concept Map: Elements of the curriculum design process

Australian Curriculum: English Requirements

The content of the intervention program was based in the *Australian Curriculum: English* (AC: E). The English sequence of content for the AC: E (ACARA, 2013) Year 2 strand *Language*, sub-strand *Phonics and words knowledge: English: Sequence of content F-6* (ACARA, 2015) states that “students will develop phonological and phonemic awareness” and “orally manipulate more complex sounds in spoken words through knowledge of blending and segmenting sounds, phoneme deletion and substitution in combination with use of letters in reading and writing” (ACARA, 2015, p. 6). The sub-strand comprises phonological and phonemic awareness, alphabet and phonic knowledge and spelling strands. Sub-strand *Spelling* states students will develop knowledge about how letter patterns represent phonemes in words and that morphemes are “meaning units” within words (ACARA, 2015, p. 7). An extract from the AC: E Year 2 sequence of content in these sub-strands is provided in Table 1.

Phonics and word knowledge sub-strand	
Sub-strand	Year 2
Phonological and phonemic awareness of the ability to identify the discrete sounds in speech (phonemes), and to reproduce and manipulate them orally	Orally manipulate more complex sounds in spoken words through knowledge of blending and segmenting sounds, phoneme deletion and substitution in combination with use of letters in reading and writing (ACELA1474)
Alphabet and phonic knowledge The relationship between sounds and letters (graphemes) and how these are combined when reading and writing	Use most letter-sound matches including vowel digraphs, less common long vowel patterns, letter clusters and silent letters when reading and writing words of one or more syllable (ACELA1824) Understand that a sound can be represented by various letter combinations (ACELA1825)
Spelling Knowledge about how sounds (phonemes) of words are represented by letters or letter patterns, knowledge of meaning units within words (morphemes) and word origins	Understand how to use knowledge of digraphs, long vowels, blends and silent letters to spell one and two syllable words including some compound words (ACELA1471) Use knowledge of letter patterns and morphemes to read and write high-frequency words and words whose spelling is not predictable from their sounds (ACELA1823) Build morphemic word families using knowledge of prefixes and suffixes (ACELA1472)

Table 1. Australian Curriculum: English (AC: E) sequence of content, strand language, Year 2 (ACARA, 2015, pp 6-7)

As this intervention took place in a New South Wales (NSW) school, the NSW *English K-10 Syllabus* which “includes all the Australian Curriculum content descriptions for English” (Board of Studies NSW, 2012, p. 11) was also used. The syllabus scope and sequence of phonological and graphological processing skills specifies the stages at which key skills should be introduced, reviewed and consolidated. The importance of teachers integrating syllabus and curriculum content is emphasised in the overview of the Department of Education and Communities’ 2013 *Literacy Continuum K-10*, which links to the 2017-2020 *NSW Literacy and Numeracy Strategy* (LNAP) (NSW Department of Education and Communities, 2017).

Triple Word Form Theory

Research findings suggest that best spelling outcomes are achieved for all student abilities by learning phonological, graphological and morphemic elements of word structure simultaneously, or conjointly, rather than sequentially. Berninger and Richards (2002) asserted that learning to spell and read encompasses storing and analysing, in memory, the phonological, orthographic and morphological word forms and their parts. Triple Word Form Theory (TWFT) based on Conjoint Theory has previously been utilised to optimise the students' word level spelling development (Berninger et al., 2010; Garcia et al., 2010). As the Year 2 teachers in this intervention reported their classes comprised mainly below average and average spellers, with some above average spellers, it was envisaged that utilising TWFT would optimise all students' "ability to coordinate the three kinds of awareness in learning to spell" (Garcia et al., 2010, p. 91) and grow spelling outcomes. TWFT aligned well to *The NSW English K-10 Syllabus* (Board of Studies NSW, 2012) phonological, orthographical and morphological skills developmental requirements.

Principles of Effective Instruction

The program utilised the six major principles of effective instructional strategies for diverse learners comprising; big ideas; conspicuous strategies; mediated scaffolding; strategic integration; primed background knowledge; and judicious review (Carnine et al., 2006). These principles provide a framework for an instructional design and student skills development. Carnine, Silbert, Kame'enui, Tarver, and Jungjohann (2006) summarised the literature on effective instructional strategies by emphasising the need for teachers, to firstly, understand how children learn; secondly, ensure they accurately dissect the skill or other relevant content to be taught into a teaching sequence for each lesson; and finally, interact connectedly with students in the course of the lessons.

In the context of spelling, there is much evidence to suggest that explicit instruction is an effective strategy to develop student word level spelling skills and is seen as essential by many researchers including Berninger et al. (2010); Berninger and Richards (2002); Joshi et al. (2008); Nunes and Bryant (2006); and Westwood (2005, 2008, 2018). The value and validity of EI is supported by three different fields of education research: a) cognitive science; b) classroom practice of master teachers; and (c) research on cognitive support (Rosenshine, 2012).

The aim of utilising explicit instruction was to commit the learned spelling skills to long-term memory: "if nothing has been added to long-term memory, nothing has been learned" (Clark et al., 2012, p. 9). Elements of an explicit instruction lesson that maximise student learning outcomes are well established (Archer & Hughes, 2011; Clark et al., 2012; Rosenshine, 1997, 2012). A lesson design includes activating prior knowledge; the teacher modelling the new skill to be taught; new material being introduced in small steps; student guided practice; and finally, student independent practice. Sometimes described as the I do, we do, you do approach (Wheldall & Stephenson, 2014). Kirschner, Sweller, and Clark (2006) also previously found that "strong instructional guidance" (p. 8) that comprises three stages; introduction to the new content, the main lesson, and finally student practice with immediate teacher feedback was more effective than constructivist approaches.

Teacher Assistance Elements

Previous research has found that professional development often fails due to a lack of teachers engaging with change, but when they see their students succeed, they are more likely to adopt techniques that worked (Guskey, 2002; Hammond & Moore, 2018). This has implications for ensuring that the model and duration of professional learning is tailored to the specific needs of teachers and their students. The aim of the professional learning in this intervention, was to explain the structure, content and delivery components of The Project. The executive and Year 2 teachers received a full day session to develop the teachers' knowledge about: a) curriculum requirements; b) subject specific word level spelling; and c) effective instruction methods including explicit instruction to maximise teaching, learning and motivation for children of all ability levels.

Teachers were provided with and supported to use a fully prepared suite of PowerPoint slides with a semi-scripted teaching sequence that provided clear teacher instructional approaches and transparent student learning outcomes We Are Learning To (WALT) and What I Am Looking For (WILF). We Are Learning To assists the teacher to identify and make clear to the student the specific learning goals for the upcoming lesson. What I Am Looking For provides the student with clarification of what they need to do to achieve the lesson outcome. Related student worksheets and activity props were also provided. Additional information on the resources given to teachers is provided later.

Pedagogical Components and Lesson Implementation

Each lesson took place in the regular literacy block. As previously stated, they were accompanied by a series of PowerPoint slides with a semi-scripted teaching sequence, providing teachers with a consistent pedagogical delivery approach. As seen in Figure 1, individual lesson elements comprised four pedagogical and literacy components based on work from scientific evidence-based research.

Elements of Explicit Instruction in the Lesson Design

A hybrid version of explicit instruction was developed to accommodate the learning objectives WALT and WILF that the teachers often used. Each lesson began with a review of previous learning that was always revised to activate prior knowledge before introducing new content. The instruction method comprised modelling of the new skill by the teacher (I do), student guided practice (we do) before independent practice (you do) (Wheldall et al., 2014). All new skills in the learning objective element were presented in small, tightly scaffolded steps, with the teacher using 'think alouds' (verbalising thoughts) when modelling the steps (I do). This was followed by guided student practice of the new skills (we do) that progressed from simpler to more difficult examples and were differentiated for weaker and more able students, whilst consistently checking for student understanding (CFU). Rosenshine calls this teaching for "mastery learning" (Rosenshine, 2012, p. 17) stating that "unless all students have mastered the first set of lessons, there is a danger that the slower students will fall further behind when the next set of lessons is taught" (Rosenshine, 2012, p. 17). Learning a skill to mastery facilitates automatic retrieval of the skill (Berninger & Richards, 2002).

Guided practice was followed by recurrent student independent practice (you do) to foster automaticity in the new skill and facilitate easy retrieval. This, in turn, frees up working memory to attend to other facets of task application, such as comprehension (Rosenshine, 2012). Independent practice was closely monitored and a high degree of accuracy (80% or higher) sought (Rosenshine, 2012). Each lesson concluded with a final

review, recapping on the learnt skills to see if the learning objective had been met. An explanation of lesson delivery components and the delivery techniques follows.

Lesson Components and Delivery Techniques

The Explicit and Direct Instruction (EDI) lesson delivery and questioning techniques comprised two key lesson delivery strategies: a) TAPPLE and b) Student Engagement Norms (Hollingsworth & Ybarra, 2009, 2018). TAPPLE is the acronym used by Hollingsworth and Ybarra (2009, 2018) for the steps teachers use to continuously check for understanding while they are teaching and Student Engagement Norms are used to engage students in meaningful skills practice. To illustrate, an example taken directly from the materials given to teachers explains these lesson delivery components.

TAPPLE

The six components representing the spelling of the acronym follow.

Teach First: This was central to each lesson. Each component was explicitly presented before checking for understanding to verify the students understood the content just taught. Gestures were used to assist students remember a difficult concept quickly (Hollingsworth & Ybarra, 2009, 2018). For example, after explaining the difference between the homophones *their* and *there*, the teacher and students pointed to a partner to reinforce *their* then raised a hand and pointed outside the classroom to illustrate *there*.

Ask a Question: Explicit questions were asked about what was just taught. For example, as no English words ends in /v/, the teacher asked “Why do we need to put an /e/ on the end of the word *love*?” Asking if a student or the class ‘understands’ can result in inaccuracies about what they have in fact learned (Hollingsworth & Ybarra, 2009, 2018).

Pause and Pair-share: In this interactive and powerful strategy, students shared their answers to a posed question with their partner, an important and valuable cognitive strategy. For example, it provided all students with pause time to think about their answer before they said it to their partner. It exercised student listening and speaking skills and their use of target “academic vocabulary” (Hollingsworth & Ybarra, 2018, p. 49), enabling demonstration of conceptual understanding. It was also used to check for student understanding about spelling knowledge or a rule.

Pick a Non-volunteer: To check for understanding at least three non- volunteers’ names were randomly selected from a jar of wooden pop sticks onto which children’s names had been written. Choosing non-volunteers facilitated a more a more realistic picture of overall comprehension than asking for volunteers, where the most proficient usually respond. Hollingsworth and Ybarra state that if no fewer than three “random students can respond correctly, it’s likely that all students are understanding” (Hollingsworth & Ybarra, 2018, p. 55).

Listen to the Response: It was important to listen carefully to the response to establish the degree of understanding (right, partially right or wrong) that related to the next step, feedback.

Effective Feedback: Three types of effective feedback were provided.

Echo: When the student provided the correct answer, it was repeated verbatim to confirm, for example, “That’s right Mae, the digraph /ai/ goes at the beginning or in the middle of a word.”

Elaborate: When a partially correct answer was given, elaboration provided the correct answer, for example, “Yes Hugh, the digraph /ai/ goes in the middle of a word” (*teacher now turns to the class, adding*) “and also at the beginning of a word.”

Explain: When a student could not answer a question (this is called ‘a red alert’) another student was selected. If they provided the correct answer, the question was again put to the first student who should answer correctly. Where there were two sequential incorrect answers the concept was retaught (Hollingsworth & Ybarra, 2018).

To support skills development, checking for understanding and effective feedback within the TAPPLE steps, the following selection of Student Engagement Norms (Hollingsworth & Ybarra, 2009, 2018) were used.

Student Engagement Norms

Mini-whiteboards: Students used a mini-whiteboard regularly throughout each lesson. Its use enabled immediate practice of the skills presented, ensured student participation and allowed the teacher to formatively assess student learning during the lesson. When the teacher saw an incorrect answer, the student was asked to rub it out and write it correctly. Immediate feedback and correction by the student is a powerful teaching and learning tool (Hollingsworth & Ybarra, 2009, 2018).

3, 2, 1 Chin-it: This was a prompt for all students to put their whiteboards under their chin after the target spelling had been written. Teachers could quickly see if all students were learning (Hollingsworth & Ybarra, 2018).

Repeat with Me: Students repeated a concept with the teacher three to five times to reinforce conceptual understanding, for example, ‘syllables are beats in a word.’

Gesture with Me: Gesture was used to assist memorising new concepts (Hollingsworth & Ybarra, 2009). For example, when alphabet spelling the tricky words of *come*, *some* and *done*, both hands formed an ‘O’ when the /o/ was spelled in each word.

Pop Sticks: A jar containing all student names on wooden pop sticks was provided so teachers could implement random student selection.

‘Think alouds’ and Pair-share: Teachers used ‘think alouds’ to verbalise the skill being assessed before asking students for feedback. It was routinely applied in guided editing to facilitate editing an incorrect sentence. During this procedure, students used pair-share to discuss their answer with a partner.

Based on the Triple Word Form approach (Garcia et al., 2010), the orthographic, phonological and morphological elements of the English spelling system were incorporated into each lesson; the aim of using this approach was to enhance student word level spelling development and depth of linguistic knowledge. These are the key elements that are considered essential (Henry, 2010; Moats, 2010; Treiman, 2017; Westwood, 2018). At the start of every lesson, students were engaged in high-interest oral and written activities that included active participation to grow syllable knowledge; phonics knowledge; phonological awareness and phoneme segmentation; and the spelling of commonly occurring irregular words that were called tricky words.

It was important to provide the teachers with engaging and enjoyable student activities that optimised students’ skills and knowledge growth in these three elements. The following linguistic spelling elements and accompanying teaching strategies provided students with a mentally stimulating and physically active lesson sequence. It must be emphasised that the teacher always modelled any new material or strategy then led the students during guided practice. To illustrate, when syllabifying, the teacher stepped out words or said the sound in words as was required by the students. No more than three

children were chosen to have a turn on their own for independent practice in each task. A description of the spelling elements and related teaching strategies employed follows.

Syllables

During the professional development, the Year 2 teachers felt confident they knew how to syllabify a word themselves but did not see developing syllabification strategies with their students as contributing to growing spelling knowledge. Knowing syllables assists in recognition and recall of longer printed words (Henry, 2010; Moats, 2010). *The NSW English K-10 Syllabus* defines a syllable as “a unit of sound within a word containing a single vowel sound, for example *won-der-ful*, *sing-ly*” (Board of Studies NSW, 2012, p. 149). Locating the number of vowels in a given word indicates the total number of syllable chunks in that word. Breaking words into syllable chunks greatly assists students with spelling patterns, providing them with “a tool for attacking longer unknown words” (Moats, 2010, p. 103).

There are six spelling patterns for syllables in English that are organised around the vowel in the centre of the syllable. These are closed, open, vowel-consonant-*e*, vowel team, vowel-*r*, and consonant-*le* syllables (Moats, 2010). The most common spelling unit is the closed syllable and contains a short vowel spelled with one letter followed by one or more consonants. Therefore, it was important to develop a solid base of syllables to enhance spelling knowledge. The following learning progression was used to

- develop students’ syllable knowledge in regular consonant and vowel sound-letter correspondences in Anglo-Saxon words, and comprised
 - closed vowels (a syllable with a short vowel followed by one or more consonants);
 - vowel-consonant-*e* (a syllable with a long vowel sound followed by one consonant and a final silent *e*);
 - vowel teams (digraphs /ai/, /ea/, /oo/, /ay/, /ee/);
 - syllables with a long or short vowel sound comprising a spelling combination of letters; and
 - vowel *r* digraph /ar/.
- support and develop more complex Anglo-Saxon letter patterns including inflectional morpheme endings, and comprised
 - derivational morpheme, separate syllables (*un-*, and *re-*);
 - inflectional morpheme, separate syllables (*-ing*, *-ed*); and
 - inflectional morphemes (*-s*, unaccented *-ed* /t/ and /d/ endings).

Twice weekly, reviewed and introduced concepts were strategically integrated in editing tasks throughout The Project. Two tasks described below presented students with opportunities to identify and edit mistakes in: a) sentence editing; and b) Word Sorts.

Editing

Sentence Editing: Twice weekly, the students and teacher took on the role of an editorial team and focused on editing taught spelling and incidental punctuation errors found in sentences. The first lesson segment provided students with guided practice to learn and consolidate newly acquired and previously learned concepts. This was applied through a scaffolded teacher and student ‘think aloud’ editing task. It preceded the student independent segment of writing the sentences correctly.

Word Sorts: In a second editing approach, teachers provided the same ‘think aloud’ guided instruction for students to practise sorting words into syllables or building words by

adding morpheme *-ing* and morpheme *-ed* to base words. The guided editing tasks were followed by student independent sentence dictation.

Dictation

Dictation has been recommended by some researchers as a beneficial tool to practise taught word spelling in connected text (Berninger, 1999; Berninger et al., 2000; Berninger & Richards, 2002; Chiang, 2004; Davis & Rinvoluceri, 2008; Oakley & Fellowes, 2016; UK Government Department of Education, 2013, 2014). Therefore, daily connected sentence dictation was advocated as a strategy to practise and assess reviewed and taught word level spelling. It was the independent student practice component in which students utilised their listening, phonemic awareness and spelling skills to apply: a) revised and taught word spelling components; b) introduced morpheme components; and c) reinforce punctuation and transcriptions skills. One or two short sentences in poetic prose were dictated daily. The words dictated to the children were controlled. For example, revised closed syllable short vowel words; vowel-consonant-*e* words; revised letter combinations /zz/, /ai/; and the introduced Doubling Four Rule and word building with morphemes *-s*.

Weekly Word Spelling Sequence

An important step in effective instruction is reviewing previously taught concepts to activate prior learning and identify any gaps that require re-teaching. To support student word level spelling outcomes and their knowledge about the role of morphemes in the English language, the weekly lesson sequence comprised *concepts to review* (for example, long and short vowel sounds and specified digraphs) and *concepts to introduce* (for example, spelling rules; specified morphemes; a variety of editing tasks; and poetic contextualised sentence dictation).

Providing daily repetition and practice in the skills being taught in both guided and independent tasks underpinned this developmental process. The content demands of the weekly learning progression developed over the duration of The Project. Each lesson comprised a daily review of taught concepts; presentation of new material and skills development; guided student practice; and student independent practice. An overview of the weekly word spelling concepts is presented in Table 2.

Week	Reviewed concepts, rules	Introduced concepts, rules	Week	Reviewed concepts, rules	Introduced concepts, rules
1	Digraph /th/, /sh/, Doubling Four	-	6	Digraph /oo/	Morpheme <i>-ed</i> , /t/ and /d/ sound
2	Bossy <i>e</i> Digraph /ai/	Morpheme <i>-s</i>	7	Digraph /ay/	Morpheme <i>re-</i>
3	Digraph /ea/	Morpheme <i>un-</i>	8	Discrimination /ai/ and /ay/	Morpheme <i>-ed</i> (separate syllable)
4	Vowel <i>r</i> /ar/, /ark/	Morpheme <i>-ing</i> to base word without change	9	Review and consolidation of all taught concepts	
5	Digraph /ch/	Morpheme <i>-ing</i> drop /e/ before adding <i>-ing</i>	10	Assessments	

Table 2. Overview of weekly word spelling: Reviewed and introduced concepts

To cater for the needs of individual students, words were presented in three levels of approximately 30% easy, 40% at grade level and 30% harder examples. Word spelling always progressed from simpler to more difficult examples. To illustrate, Week 3 addressed the digraph long vowel digraph /ea/ (*eat, heat, peach, bleak*) and introduced morphemic content *un-* (*unclean, unseal, unheat, unable, unblock*). In Week 5 students practised cumulative digraph concepts, combining consonant /ch/, with vowel digraphs /ai/, /ea/ and vowel r /ar/ (*chair, arch, bench, chest, teach, chunk*) with the harder content containing morpheme *-ing* (*teaching, chunking*). Spelling tasks relating to one syllable base words featured less as The Project progressed and more difficult two and three syllable content of attaching prefix and suffix morpheme content to a word was added. For example, tasks in Week 7 featured word building with morphemes *re-*, *-ing* and *-ed* (*reusing, regaining, reflecting, remembered*). A busy bee icon identified challenge words for the above average spellers.

The activities in Weeks 4 and 8 relating to the word level spelling (comprising phonological awareness, phonics and Tricky Words) content in the lesson sequence are now explained.

Phonological Awareness

Week 4: Each lesson commenced with identifying syllables in words, followed by phonemic awareness and segmentation of a word, such as *bark*, where each sound was isolated (b- ar-k) before writing the correct spelling. It also included adding the morpheme affix *-ing* to previously taught base words (b-ar-k-i-ng).

Week 8: The same sequence of identifying syllables in words was followed. Phonemic awareness and segmentation included adding the morpheme affixes *-ing* and separate syllable *-ed* (for example raid-ed) to previously reviewed base words. Again, students, isolated each sound before writing the correct spelling.

Phonics Skills

Week 4: Identifying short and long vowel sounds and isolating the vowel in a given word that matched a picture (from the suite of PowerPoint slides) was practised daily by bobbing down for short vowels or stretching tall for long vowel sounds, for example, *drone*. Ten randomly selected consonants were also reviewed. A picture relating to each of the three words containing the target consonant digraph was presented, for example *brush*. The word was spelled orally before the students recited in unison “/sh/ as in brush”.

Students practised phonics word spelling daily, to isolate each sound before spelling the word on their mini-whiteboards. A definition of the morpheme *-ing* was provided before being added to previously reviewed base words (word building) and then repeated using the same strategies, for example *brushing*.

Week 8: Again, pictures of words containing the target vowel digraph were presented, for example digraph /ai/ on the work *quaint*. Students spelled the word orally then repeated in unison “/ai/ as in quaint.” Discrimination between /ai/ and /ay/ was rehearsed first by spelling the word orally from a picture cue, such as, *rain* and *x-ray* before writing it on the mini- whiteboard. The three sounds of morpheme *-ed* (/t/, /d/ and separate syllable *-ed*) had previously been defined prior to students adding it to reviewed base words. Random students were selected to fill in gaps on the teacher’s whiteboard before independent writing, for example, *brushed, chained, fainted*.

Tricky Words

Week 4: These comprised irregular and high frequency words and were rehearsed daily. Either a visual strategy accompanied by a rule where applicable or a mnemonic was used. Guided practice of previously taught concepts was applied twice weekly through an error elimination game (for example, is *want* spelled *wont* or *want*?) and word cloze (fill in the missing word in a sentence).

Week 8: Words were presented in levels of difficulty which increased in difficulty as the sequence progressed (such as *their* and *there*). An outline of the slide content that supported the spelling progression follows.

The Intervention Weekly Cycle Structure and Instructional Sequence

The weekly cycle structure and sequence was developed around the six major principles of effective instructional strategies for diverse learners (Carnine et al., 2006) noted above. These principles provided the framework for the instructional design and student skills development. They incorporated the specific recommendations proposed by Coyne et al. (2011). The aim was to support students to transfer their prior learning to more difficult or extended tasks. The instruction was based on a sequence in which common elements contained in each of the following six components increased in complexity. An explanation of the sequence follows.

Big Ideas: Carefully selected concepts, rules and strategies “that facilitate the most efficient and broadest acquisition of knowledge” (Coyne et al., 2011, p. 14) were utilised. The Big Idea content was linking phonological, morphological and orthographic spelling elements, related rules and dictation to optimise word spelling development.

Conspicuous Strategies: A well-sequenced explicit teaching and learning sequence incorporating the Big Ideas was developed and provided to teachers on PowerPoint slides. Related student worksheets and activity props were also provided.

Mediated Scaffolding: Instructional scaffolding supported students to link familiar, well established concepts with unfamiliar, new complex concepts. The daily review of previously taught concepts and skills, repeated through mediated scaffolding, provided a link to new skills introduced. When identifying long and short vowel sounds in a word, examples progressed in difficulty from students identifying single, oral vowel sounds to identifying short and long vowel sounds in a given word that matched a picture on the slide. These preceded students independently applying familiar concepts and practising more complex new concepts.

Strategic Integration: Base word spelling concepts were scaffolded through guided instruction that included associated spelling rules and continuous formative assessment. This formed the foundation on which to build and integrate word building with morphological content. Without first developing solid foundational knowledge of the base word, integrating the new morphological affix content would be unlikely to lead to development and subsequent automaticity of the new skill. Each of the phonological, morphological and orthographic elements was integrated during guided practice of word level spelling, editing and independent dictation.

Primed Background Knowledge: This is “the related knowledge students must know in order to learn a new concept, strategy ... or big idea.” (Coyne et al., 2011, p. 8). The Year 2 teachers had not previously included specific phonological, morphological and orthographic skills in spelling instruction. To optimise development of these three skills, it was important

that students were primed in revised or learned foundational knowledge *before* the new content was introduced. This was addressed through the ‘concepts to review’ content of The Project.

Judicious Review: Continuous systematic review provided students with a repertoire of sequenced tasks to apply, practise and develop their new knowledge and skills. In tandem with explicit instruction it offered a progression of opportunities to promote mastery learning (Hollingsworth & Ybarra, 2018) incorporating the phonological, morphological and orthographic components to optimising spelling development (the Big Idea). The varied sentence editing tasks, and independent dictations gave students the opportunities to apply and practise their new cumulative knowledge that was integrated into these more complex tasks.

Teaching Resources

An important part of The Spelling Detective Project was that each lesson be delivered in a manner consistent with the fast-pace characteristic of explicit instruction. This approach saw students engaged by asking the whole class to “do something at the same time” (Hollingsworth & Ybarra, 2018, p. 18) an approach that the teachers were not familiar with. Developing and preparing materials is daunting and time consuming for teachers especially when they are unfamiliar with an approach. To support the teachers, they were provided with a suite of pre-prepared PowerPoint semi-scripted slides for each lesson.

PowerPoint Slides and Script

Slides were uncluttered so as not to distract from the concept being taught. To illustrate, in the syllabification task of the word *dragonfly*, a clear coloured picture of a single dragonfly was displayed. Each slide contained a semi-scripted sequence of teaching steps. Presenting fully prepared lessons in a semi-scripted format equipped the teachers with EI delivery consistency and a platform for important continuous formative assessment. The script also gave the teachers a sequence in which to implement tightly scaffolded, fast-paced lesson delivery through enjoyable activities as well as providing a consistent check for student understanding (CFU) during each lesson.

Each week teachers were provided with spelling and morpheme rules for classroom display as well as prepared student work sheets for specific editing tasks. Worksheets for the editing activities, including sentence editing and syllable sorting, were supplied to minimise teacher preparation time. The pre-prepared semi-scripted lessons ensured the teachers had a sequence that would facilitate a tightly scaffolded, fast-paced lesson delivery. The suite of slides, additional materials and explicit pedagogical strategies also provided the teachers with the tools to allow them to constantly check for student understanding and monitor progress. The rationale for this assessment approach follows.

Progress-monitoring Assessment

To enable teachers to assess students formatively during lessons and summatively after a period of instruction, a number of program-specific progress-monitoring assessments (Carnine et al., 2006) were incorporated into each lesson. This enabled the teachers to see if their students were actually learning what was “being taught” (Carnine et al., 2006, p. 240) in the lesson. It provided continuous, systematic, formative assessment to assess student

progress and achievement, giving teachers ownership of their students' learning and included features that promote mastery learning (Hattie, 2009).

Formative assessment: For example, formatively, as per the EI approach to teaching, material was presented in small steps, with "high levels of teacher feedback that is both frequent and specific" including "the regular correction of mistakes students make" (Hattie, 2009, p. 170). The consistent use of student mini-whiteboards enabled teachers to see how each student was progressing in the learning goal and provided them with instant corrective feedback. In a synthesis of meta-analysis on achievement, Hattie (2009) stated that:

The major message is for teachers to pay attention to the formative effects of their teaching, as it is these attributes of seeking formative evaluation of the effects (intended and unintended) of their programs that makes for excellence in teaching. (p. 181)

Daily formative progress was monitored using the following daily formative strategies

- the setting of appropriate, but challenging 'We Are Learning To' (WALT) goals;
- activating prior knowledge;
- continuous use of TAPPLE (Hollingsworth & Ybarra, 2009) steps to check for understanding;
- students providing the teacher with feedback on a correct spelling and the related rule;
- teacher and student cooperation through 'think alouds' and pair-share tasks; and
- editing tasks.

Formal summative assessment: This comprised daily connected sentence dictations in poetic prose. The dictations measured students' ability to transfer taught spelling concepts to a writing task that was free from composing (Berninger, 1999; Berninger et al., 2000). This also provided evaluation on the effectiveness of the lesson.

Results

Because the results are long and comprehensive, they require much explanation and therefore, they are reported in detail elsewhere (Robinson-Kooi, 2019; Robinson-Kooi & Hammond, 2020). For similar reasons, this paper concentrates on the details and explanation of the instruction process implemented during The Project. However, to summarise, quantitative student spelling results in the two pre-intervention dictation tests reflected the low NAPLAN Year 3 spelling outcomes which had remained unchanged or reduced in the intervention school between 2012 to 2016. Post-intervention dictation results revealed that the Year 2 students who received the intervention showed a modest to strong effect size in the two post-tests.

Post-intervention feedback from randomly selected students whose teachers had deemed below average, average and above average spellers revealed that the majority were motivated and engaged in The Project; students also felt it was a good approach to learning how to spell. Overall, feedback from the teachers and executive involved was very positive. They also reported that the Year 2 students from all spelling ability levels were motivated, engaged and achieving. Furthermore, many students were now using spelling terminology and thinking about associated spelling concepts.

Conclusion

The bespoke nine-week Spelling Detective Project was designed to support spelling development for Year 2 students in a NSW school. It catered for all students including those with learning difficulties and an EALD background. It drew on the content of the *Australian Curriculum: English* (ACARA, 2013) whilst the fully prepared project and semi-scripted content provided teachers with high impact instruction, delivery consistency and a learning progression for students of all ability levels in a mainstream class setting. Student post-dictation results showed a modest to strong effect size. Overall, teacher and student feedback on The Spelling Detective Project was very positive.

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