Catch Up Your Code

Based on Research, Supported by Evidence

Decoding and spelling words both depend on knowledge of the alphabetic code. Students from Grade 3 and above should have an in-depth knowledge of how the alphabetic code of English works. For most, this requires explicit instruction that makes clear the many ways that sounds are written, using letters and letter patterns. Without this knowledge, students in the upper grades may not be able to read and write efficiently and fluently at grade level.

The Problem

- Students in Grades 3 and beyond meet texts that rapidly increase in length and complexity, and include more unusual, multisyllabic, and technical words.

- Knowledge of the diversity of the alphabetic code is necessary for decoding and spelling complex words. Without it, students may mispronounce words as they read and choose to only use words they can spell as they write.

- Although students already use the alphabetic code as they read and write, many are not aware of phoneme-grapheme relationships. A conscious understanding of these relationships supports reading and writing complex, unfamiliar words, particularly in new content areas.

The Approach

- Catch Up Your Code was written to teach students in Grade 3 and beyond to hear and record every sound of English in diverse ways.

- Students' oral language is the platform for teaching the diversity of the alphabetic code.

- The unique Alphabetic Code Assessment provides teachers with evidence of what is already known, and where there are gaps in code knowledge. The assessment can be used to inform instruction, track progress, and measure the impact of instruction on outcomes.

- Lessons take just 10 minutes a day and can be completed in a 10-week term, making it possible to catch-up this essential knowledge in a very short time.

The Research

- In 2018, 1220 Grade 3 to Grade 7 New Zealand students, encompassing a diverse demographic, completed the Alphabetic Code Assessment before receiving *Catch Up Your Code* instruction.

- Results for writing every sound of English one way, and for writing the sounds of English in diverse ways were compared, and effect size shifts calculated.

- The writing progress of a group of students was tracked before and after *Catch Up Your Code* instruction.

Key Findings

- Explicit instruction using the speech-to-sound-to-print approach, for 47 10-minute lessons showed significant improvements in knowledge of the alphabetic code, with effect size shifts between .6 and 1.0.

- Improvements in knowledge of the alphabetic code positively impacted writing skills for a target group of students.

Read on for the complete report.

Code-Ed

Introduction

Students in Grades 3 and beyond meet texts that rapidly increase in length and complexity. They include multisyllabic words that students often do not recognize in their written form. Comprehension and fluency for reading more advanced texts requires students to have developed accurate and efficient decoding strategies. Decoding refers to a reader's ability to translate written words into spoken language. It takes a great deal of knowledge and a multitude of skills, all working together, to become a fluent, automatic, and accurate decoder. The knowledge and skills that support decoding need to be explicitly taught and practiced.

Decoding unfamiliar, multisyllabic words depends on:

- knowledge of grapheme-phoneme relationships (the alphabetic code),
- skills blending sounds and sound chunks together to pronounce words, and
- knowledge and strategies for recognizing and pronouncing syllables.

Alphabetic code knowledge

Many of the problems associated with learning to read and write English accurately occur because of the diversity of the alphabetic code. Most sounds can be written in more than one way and most letters and spelling patterns can be pronounced in different ways.
If students lack knowledge and understanding of the alphabetic code, it will affect their reading and writing fluency. If they cannot recognize graphemes, their skills with sounding out unfamiliar words are limited, which impacts their ability to read accurately. This has a negative effect on reading comprehension. If they have limited strategies and knowledge for sounding out and spelling words they wish to write, they will often choose to only write words they can spell. This has a negative impact on the quantity and quality of their writing, with their written language not matching their spoken language.

The importance of having an in-depth knowledge of the alphabetic code cannot be overstated. It is the foundation for working with print. Students who have been at school for four years and more should have a deep and growing knowledge of the diverse nature of the alphabetic code so that they can use this knowledge as they read and spell unfamiliar words.

The Research

The Alphabetic Code Assessment (*Catch Up Your Code*, 2020) evaluates students' ability to write every sound of English in at least one way and to write many sounds in more than one way. Although students in Grade 3 and beyond probably do this every day, many of them remain unaware of how they are using code knowledge, which means they do not have knowledge they can consciously apply to new situations.

This assessment includes 43 sounds of English (in New Zealand the /aw/ and /or/ sounds are pronounced the same), plus two sound clusters /k//w/ (qu) and /k//s/ (x), giving a total of 45 sounds. In 2018, 1220 Grade 3 to Grade 7 New Zealand students, encompassing a diverse demographic, completed this assessment before receiving *Catch Up Your Code* instruction. 1109 students completed the assessment again after instruction.

The expectation was that most (if not all) students would be able to write every sound of English in at least one way, but that their knowledge of writing sounds in different ways might be less secure. In reality, students' conscious knowledge of how to write the sounds of English in one or more ways was poor, and for some students there were significant gaps in this knowledge. Prior to instruction, 16.39% of Grade 3, 13.31% of Grade 4, 20.13% of Grade 5, 12.38% of Grade 6 and 19.05% of Grade 7 students scored less than 30 out of 45, meaning there were 15 or more sounds they could not consciously write in even one way.

Over a period of approximately four months, students were taught the 47 10-minute lessons from *Catch Up Your Code*.

The Alphabetic Code Assessment was re-administered at the end of instruction and pre and post instruction results compared. Effect size shifts were also calculated for 843 students who sat both assessments.
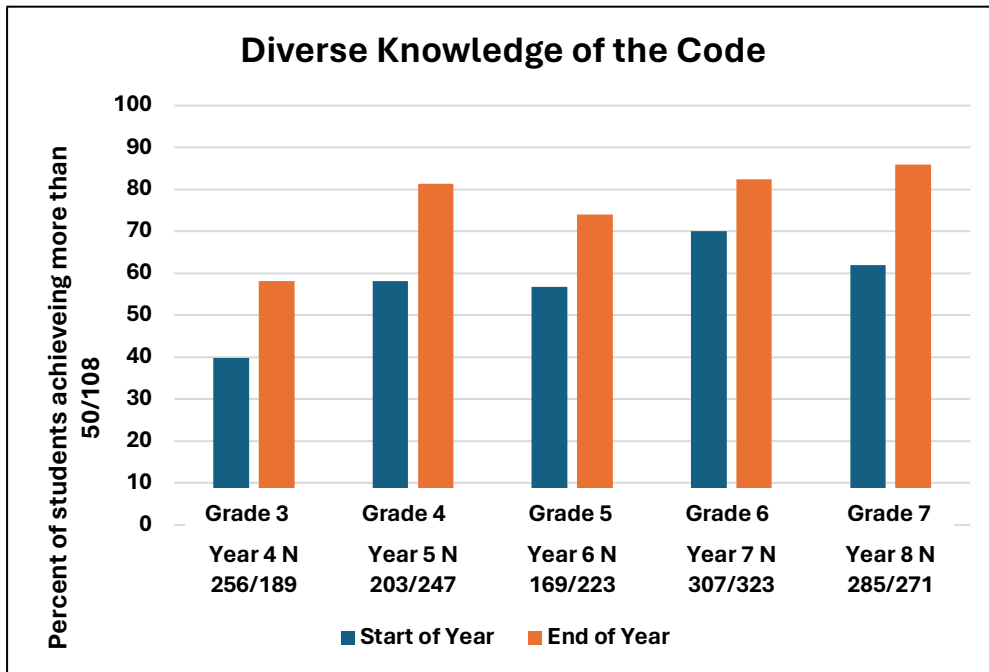
Results

Data Analysis and Progress Reports by **beagle**® software application (www.beagleinnovations.com)

The graph below shows results for students who could write the most sounds one way (there were only 5 or fewer sounds they could not write), and for those who could write the least sounds one way (there were 15 or more sounds they could not write). After instruction, at all grade levels, there were fewer students scoring 30 or less and more students scoring 40 or more.
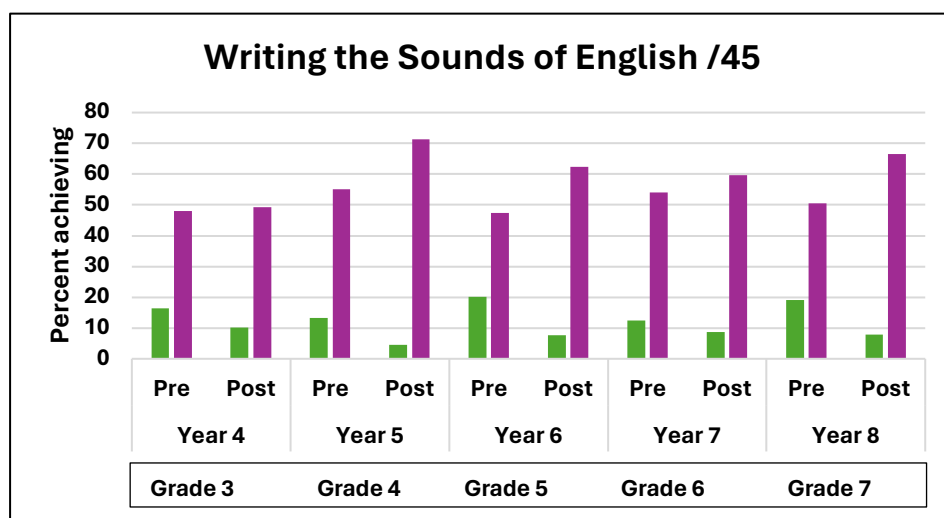
The graph below shows the results for writing 50 or more different graphemes for the 45 sounds of English. At the start of the year (1220 students) there was no pattern to achievement across grades, but at the end of the year (1109 students), with the exception of Grade 4 students who showed accelerated progress, there is a steady increase in achievement across grade levels. This makes sense in that Grade 7 students, for example, have a lot more knowledge of language, print, and the alphabetic code than Grade 3 students, but they may not have realized what they knew until this instruction unlocked their knowledge for them.

Diverse Knowledge of the Code

	Grade 3 Year 4 N 256/189	Grade 4 Year 5 N 203/247	Grade 5 Year 6 N 169/223	Grade 6 Year 7 N 307/323	Grade 7 Year 8 N 285/271
Start of Year	40	58	57	70	62
End of Year	58	81	74	82	86

Percent of students achieveing more than 50/108

Effect size shifts were calculated for students who sat the assessment twice, showing that students at all grade levels made significant progress over just a few months of instruction.

| Grade Level	Effect Size Shift
3 (N = 108)	.7
4 (N = 162)	.6
5 (N = 120)	.7
6 (N = 254)	.6
7 (N = 199)	1.0

Case Studies

Comparing results between classes

Rooms O and P had similar pre-assessment results. Room O had disrupted instruction during the year. The teacher in room P was able to provide consistent instruction which made significant shifts in students' knowledge. The effect size shifts reflect this.

Alphabetic Code Assessment /108	Achievement Mean			Achievement Median			Achievement Gap Range between scores			Effect Size Shift
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	
Room O (Grade 6)	63.9	67.4	+3.6	63	71	+8	47	48	+1	**0.3**
Room P (Grade 7)	62.2	93.2	+31.1	63.5	95.5	+32	37	52	+15	**2.9**

Tracking writing progress for a target group of students

Writing progress was tracked after four and a half months of *Catch Up Your Code* instruction for a target group of students (96 at pre-assessment and 98 at post-assessment). The assessment tool used was e-asTTle (New Zealand Ministry of Education). Grade level achievement increased in all categories, with no students in the At Risk category after instruction.

At risk: Two or more grade levels below
Below: One grade level below
At: At grade level
Above: Above grade level.
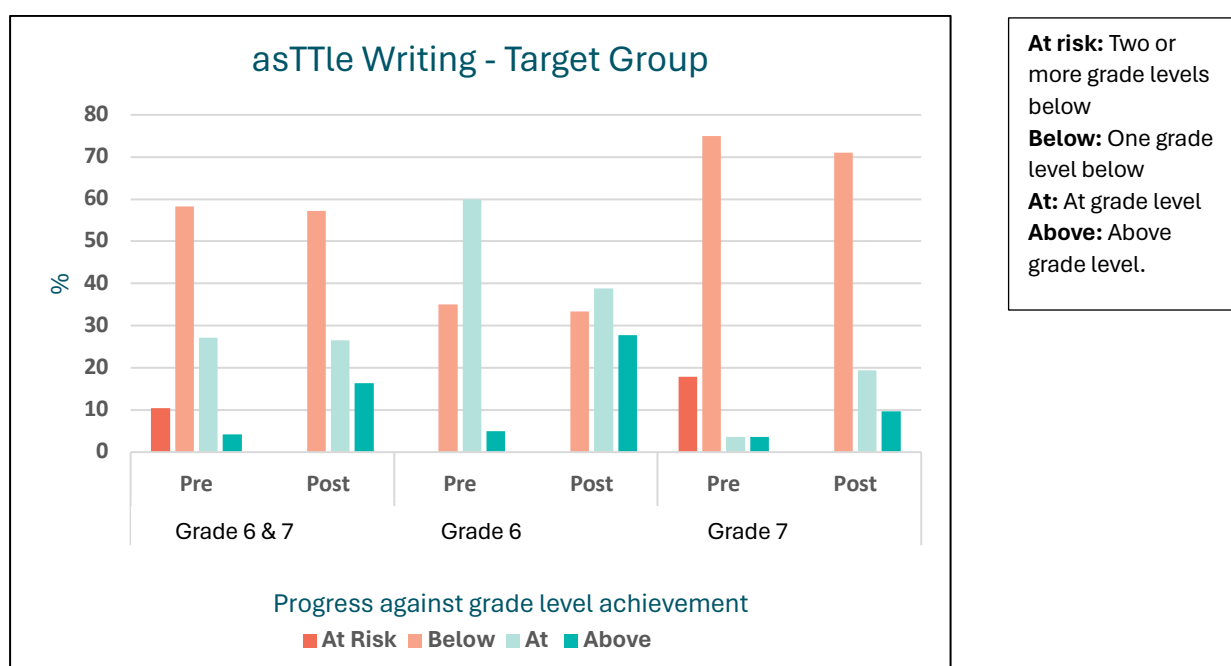
Summary

The assessment results from the Alphabetic Code Assessment show a significant improvement in knowledge of the alphabetic code, with effect size shifts ranging from .6 to 1.0. A target group of students also showed improvements in their writing after *Catch Up Your Code* instruction, particularly the students whose performance was initially well below age expectations.

Knowledge of the alphabetic code is critical for accurate and fluent decoding and encoding. However, students need to be explicitly taught how to transfer this knowledge to reading and writing.

Transferring code knowledge

Once alphabetic code knowledge is secure, students can use it to recognize and decode syllables, and to write multisyllabic words. Many adolescent readers have difficulties decoding unfamiliar, multisyllabic words in new content areas, and this issue has been recognized by several researchers.

> The complexity of words increases markedly in upper-primary grades, and even more dramatically in the specialized subjects at secondary level. For many students, their capacity to identify words falters under the challenge of these more **unusual, often multi-syllabic, technical and abstract words.** (p. 1)

Hempenstall, K. (2005). *The quiet crisis of upper-level illiteracy*. Melbourne: The Age, 6 June 2, www.theage.com.au

> Many struggling adolescent readers understand the rules of basic decoding but are not as familiar with the rules of decoding multisyllabic words ... **multisyllabic decoding is not usually a focus of early literacy phonics instruction**, and therefore many students are ill-prepared when they encounter texts that include an increasingly large proportion of previously unfamiliar multisyllabic words. (p. 21)

Deshler, D.D., Palincsar, A.S., Biancarosa, G., & Nair, M. (2007). *Informed Choices for Struggling Adolescent Readers: A research-based guide to instructional programs*. New York: International Reading Association.

Sort Out Your Syllables transfers the knowledge and understanding of the alphabetic code, taught in *Catch up Your Code*, to reading and writing unfamiliar, multisyllabic words. It teaches a logical system that leads to the correct, or close to correct pronunciation of words, which allows students to access their meaning.

The purpose of teaching syllables is not to teach students where to put a syllable divider in a word. It is to help them understand increasingly complex text by learning to decode and pronounce unfamiliar, multisyllabic words. If the rules are too many or too complex for students to use as they read, the purpose is defeated. *Sort Out your Syllables* addresses this problem by teaching a simple, consistent four-step strategy, based on knowledge of the alphabetic code, for dividing words into syllables.