Lingo: Bridging the Science of Reading with Secondary English Learning

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11 August 2025

Abstract

A lack of fundamental literacy skills, including spelling, vocabulary, and grammar, affects a large number of secondary school students. Their sophisticated analytical thinking skills go to waste because these gaps hinder effective written communication. This paper provides an overview of Lingo, a personalised literacy platform, and describes how its design incorporates the Science of Reading and the Science of Learning to bridge these gaps. Lingo applies educational research by providing adaptive daily exercises, responsive and relevant feedback, explicit teaching when necessary, and custom-crafted instruction. Lingo helps students progress from rote accuracy to confident, eloquent expression by systematically building fluency and enriching word databases, thereby reducing cognitive load.

Introduction

In Years 7–9, the learning outcomes of English classes centre around text analysis, persuasive writing, and media interpretation. These skills enable students to read and comprehend texts, articulate their ideas in writing, and use sophisticated vocabulary. The curriculum prescribes that students join Year 7 with strong foundational skills in spelling, vocabulary, punctuation and grammar which are usually planted in primary school.

There are, however, gaps in the skills students possess. For instance, one student may not be able to read and spell the most frequent words in the English language, another may be unable to correctly punctuate plural possessives, and yet another be confused regarding the definition and usage of Tier 2 vocabulary. While whole-class strategies (such as a designated standard spelling list or a grammar workbook) are somewhat useful, they seldom address the personalised attention needed to match the specific gaps of each individual.

Lingo was designed specifically to address this challenge. It is a personalised, adaptive learning platform that delivers short daily activities in spelling, vocabulary, and functional grammar. The system targets each student's specific areas of need, provides immediate, descriptive, and actionable feedback, and tracks progress toward mastery over time. While Lingo is a new tool, its design draws heavily on established principles from the Science of Reading and the Science of Learning.

The Science of Reading and the Science of Learning in Secondary Literacy

The Science of Reading is a body of interdisciplinary research that explains how reading develops, why some students struggle, and which teaching methods are most effective.

A key framework is the Simple View of Reading, which defines reading comprehension as the product of decoding and language comprehension (National Institute of Child Health and Human Development [NICHD], 2000). Both elements must be in place; a weakness in either limits a student's ability to understand text.

Scarborough's Reading Rope expands this idea, showing that skilled reading results from the integration of word recognition skills – such as phonological awareness, decoding, and sight recognition – and language comprehension skills such as vocabulary, background knowledge, and syntax (Australian Education Research Organisation [AERO], 2022).

In secondary school, decoding difficulties may be less common than in early years, but gaps in fluency, vocabulary, and grammar remain highly relevant. Research on Cognitive Load Theory shows that when basic processes are slow or error-prone, they consume mental resources needed for higher-order thinking (AERO, 2023). Automating foundational skills frees working memory, allowing students to focus on meaning-making, argumentation, and analysis.

The Science of Learning offers further insights into how students retain and apply knowledge. Principles such as retrieval practice, spaced learning, and interleaving are well-documented in both lab and classroom studies. These show that long-term mastery comes from repeated, varied practice and meaningful feedback (Hendrick & Macpherson, 2017). Lingo's design deliberately incorporates these principles alongside the Science of Reading to maximise both skill acquisition and retention.

How Lingo Works

Lingo is built around a small number of core features. Each feature was designed to solve a specific problem in secondary literacy and is underpinned by principles from the Science of Reading and the Science of Learning.

Daily Adaptive Practice

When students log in, they see a small set of daily activities, balanced between spelling, vocabulary, and grammar. The system determines which items to present based on the student's current performance, ensuring they spend time on areas where gaps remain. For example, if a student has difficulty spelling "environment", that word will reappear in varied formats – typing it out, choosing it from a list, identifying it in context – until the student demonstrates consistent accuracy.

This design supports fluency by providing spaced, distributed practice at an appropriate

difficulty level. As skills become automatic, working memory load decreases, enabling more complex reading and writing tasks (NICHD, 2000; ACER, 2025).

Descriptive, Diagnostic, and Actionable Feedback

When a student makes an error, Lingo's feedback does more than supply the correct answer. It highlights the exact nature of the error and explains it in a way that connects back to underlying concepts. For example, if a student spells "environment" as "enviroment" (missing the 'n'), the feedback may reference the phonics pattern and explain that the "n" is part of the "-ron-" syllable in the middle, then prompt the student to try again or reinforce with another example.

By linking errors to phonics patterns, morphological structures, and meaning (and giving students a clear next step) this feedback supports orthographic mapping, strengthens morphological awareness, and makes the learning immediately actionable (AERO, 2022; Queensland Department of Education, 2022).

Strategic Word-List Construction

Lingo's spelling and vocabulary lists are not random. Words are grouped deliberately to highlight meaningful relationships. Homophones (e.g., "stationary" and "stationery") are learned together so that students can compare and contrast spelling and meaning. Words from the same morphological family (e.g., "desperate", "desperation", "despair") appear together, helping students see how word parts connect to meaning and spelling.

This grouping encourages morphological awareness: the ability to recognise and use the meaningful parts of words. This skill is strongly linked to vocabulary growth and reading comprehension (ACER, 2025).

Targeted Blocked Practice with Explicit Teaching

If a student repeatedly struggles with a specific concept, Lingo shifts from mixed practice to targeted "blocked" practice. In this mode, the student answers several consecutive questions on the same skill, accompanied by explicit instruction. For example, if the issue is placing apostrophes in plural possessives, the system might first explain the rule with examples, then give ten focused practice questions in a row.

This approach reflects the principles of explicit instruction: clear modelling, guided practice, and scaffolded support. This is effective for closing gaps in both early and later literacy learning (AERO, 2023).

Gap Filling Rather than Systematic Re-Teaching

In primary school, phonics is taught systematically from the simplest sound-letter correspondences to more complex patterns. Secondary students using Lingo have already been through this process; the challenge is unfinished learning, not a lack of initial exposure. Lingo's approach is to identify and fill residual gaps as they appear, providing precise explanations that connect back to prior learning.

This respects the time constraints of secondary classrooms while still addressing the root cause of persistent errors (Queensland Department of Education, 2022).

Deep Learning Over Rote Recall

Lingo's design aims to build robust, flexible knowledge; not just short-term memorisation. Contextualised sentences, comparisons between related words, and feedback that links form and meaning all encourage students to store and retrieve words in rich, interconnected ways. This supports long-term retention and transfer to authentic reading and writing tasks (AERO, 2022; ACER, 2025; Hendrick & Macpherson, 2017).

Lingo Feature	Aligned Science of Reading Principle
Daily Adaptive Practice	Fluent Word Recognition & Reduced Cognitive Load
Descriptive, Diagnostic, and Actionable Feedback	Phonics, Morphology, Orthographic Mapping
Strategic Word-List Construction	Morphological Awareness & Vocabulary Depth
Targeted Blocked Practice with Explicit Teaching	Explicit, Systematic, Scaffolded Instruction
Gap Filling Rather than Systematic Re-Teaching	Diagnostic Teaching Linked to Prior Knowledge
Deep Learning Over Rote Recall	Semantic Connections & Long-Term Retention

Figure 1: *Lingo ↔ Science of Reading Alignment Map*

Implications for Secondary Literacy Practice

The Science of Reading is often associated with early reading instruction, but its principles are equally relevant in secondary school. If left unaddressed, gaps in spelling, vocabulary, and grammar continue to undermine students' ability to succeed in advanced reading and writing tasks. The Science of Learning complements this by providing evidence-based strategies for how knowledge is best consolidated, recalled, and applied.

By automating fundamentals, providing targeted, actionable feedback, grouping words strategically, and delivering explicit instruction when necessary, Lingo offers a model for

closing literacy gaps in a way that aligns with both research evidence and the realities of teaching time.

Conclusion

Secondary students cannot fully engage with analytical and creative literacy tasks if they are still struggling with basic spelling, vocabulary, or grammar. Lingo addresses this challenge by bringing the Science of Reading and the Science of Learning into the secondary context: focusing on fluency, diagnostic feedback, morphological awareness, and explicit instruction. The result is an approach that fills individual learning gaps efficiently, builds deep and connected knowledge, and frees cognitive resources for the higher-order demands of the secondary English curriculum.

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