



READING EGGSPRESS COMPREHENSION PROGRAM

SCIENTIFIC RESEARCH BASE NOVEMBER, 2014

BY AMY RUSSO

WITH KATY PIKE



“Research demonstrates that when primary grade students receive optimal comprehension instruction, their performances on measures of literal, inferential, and metacognitive comprehension increase, as do their vocabulary; decoding, problem-solving, and cooperative learning skills; and self-esteem.” (Ness, 2011, p. 99)

Considering the inherent complexities involved, learning how to read high level, complex texts is an extraordinary achievement (Connor, Phillips, Kaschak, Apel, Kim, Al Otaiba, Crowe, Thomas-Tate, Johnson, Lonigan, 2014; Ricketts, Cocksey & Nation, 2011; Nation, 2009). A good reader is someone who actively reads and predicts what will happen next. These readers construct, revise and question as they read (Duke & Pearson, 2002). They develop understanding through higher-order thinking as they decode words, apply meanings and interpret the differing structures of a text (Nation, 2009).

As understanding is the ultimate goal for reading, teachers need to find effective ways of teaching comprehension. This requires a balance of direct instruction and time spent reading quality texts for students to put into practice predicting, summarising and questioning (Duke & Pearson, 2002). The **Reading Eggspress Comprehension program** combines best practice through a balance of direct instruction and a range of engaging activities for students to independently apply new knowledge in meaningful ways. An integral part of classrooms in the 21st century is computer technology with research showing how purposeful computer-based tasks can help teachers in diverse classrooms achieve improved reading outcomes (Kamil & Chou, 2009; Lysenko & Abrami, 2014; Ponce, López & Mayer, 2012; Slavin, Lake, Chambers, Cheung, Davis, 2009). This wide research base was central in informing the use of adaptive computer components to help teachers individualise instruction.

Process of comprehension

Decoding and comprehension are different skills

Evidence from educational linguists supports the theory that the decoding element of reading requires different linguistic and cognitive abilities to those used to comprehend texts (Gough & Turner, 1986; Muter, Hulme, Snowling & Stevenson, 2004; Ricketts et al., 2011). Decoding is dependent on the quality of phonological

skills to assist with word recognition (Muter et al., 2004) whereas understanding is built upon the interaction of cognitive, metacognitive and motivational variables (Dignath & Büttner, 2008). Recognising the role of these variables, the **Reading Eggspress Comprehension program** makes the cognitive and metacognitive skills required for comprehension explicit to learners.

Reading strategies & Reading skills

With the goal of deep understanding of texts read, research supports explicit teaching of deliberate reading strategies to enable fluent reading skills (Afflerbach, Pearson & Paris, 2008; Atkins, 2013; Conor et al., 2014; Reutzel, Child, Jones, Clark, 2014). Explicit instruction requires explanation of the mental processes to help students “think their way through texts” (Duffy, 2009, p.45). Afflerbach and peers (2008) outline the differences between reading comprehension strategies and reading skills. The difference can be seen as a process of transition of cognitive effort from deliberate structured learning to automatic usage. Reading strategies are deliberate, conscious, metacognitive acts that once used automatically with fluency become an embedded part of an individual’s reading skills. The fundamental aim for students progressing through the increasingly complex texts in the **Reading Eggspress Comprehension program** is to gain fluency to transform strategies into reading skills. To enable this, the program offers multiple opportunities for students to independently put into practice the strategies they are taught. Designed as an adaptive computer program, students implement each strategy multiple times with different texts. They are also able to play through these activities multiple times to help them gain fluency and deeper understanding of text.

Building comprehension

Reading comprehension & vocabulary

Research suggests an inextricable link between reading comprehension and vocabulary (Beck, Perfetti

& McKeown, 1982; Duke & Pearson, 2002; Graves, 2000). The explicit instruction of new vocabulary words in the research conducted by Beck and her peers was shown to produce students that could perform better on comprehension based tasks (Beck et al., 1982). Graves (2000) advocates for extensive reading coupled with the explicit teaching of strategies with targeted words to maximise success. The implication is for teachers to use this knowledge to partner reading comprehension instruction with vocabulary programs that enable students to acquire new word meanings for reciprocal benefits in both areas. The pre-reading activities in the **Reading Eggspress Comprehension program** include many activities that focus on building word knowledge and increasing vocabulary knowledge. This increase in word knowledge and their meanings will in turn assist them to make gains in reading comprehension.

Models of comprehension

Educators face the challenge of building programs that are tailored to the reading comprehension level of each student. Duke & Pearson (2002) showed the success of these programs relies on five elements to support students to become effective readers. The elements are:

- explicit teaching of reading strategies;
- modelling strategies in action;
- collaborative strategy implementation;
- guided practice and transfer of responsibility to students;
- independent use of the strategy.

Close reading is an instructional method that has emerged in recent research as a tool for younger students to help them critically examine texts (Fisher & Frey, 2012; Fisher & Frey, 2014b). Using close reading helps students evaluate text in a thorough and methodical way (Beers & Probst, 2013). The features of close reading are:

- short passages where the focus is intense;
- complex texts that require repeated readings;
- text focused exploratory study;
- text-dependent questions.

Both of these pedagogical examples of best practice have been integrated to produce a robust and rigorous design to benefit students in the **Reading Eggspress Comprehension program**. Explicit direct instruction of strategies is employed with short focused texts. Strategies are modelled and a range of tools used to lead the

exploratory study of text and enable guided practice. This enables the gradual transfer of responsibility to students as they put skills into practice in meaningful applications. At the core is the text as the focus, with the outcome to critically and methodically unpack text to enable deep understanding.

Levels of comprehension

The **Reading Eggspress Comprehension program** draws upon three comprehension types – literal, inferential, and critical. It builds and assesses these using content appropriate grade level texts with increasingly complex texts and questions that challenge students to read closely. Strategies for each level of comprehension are explicitly taught to create a solid foundation for students to draw from as they move to independently comprehending more complex texts.

The role of literal comprehension is to extract information that is explicitly stated in a text (Carnine, Silbert, Kame'enui, & Tarver, 2010). As it requires students to look for information that is explicitly outlined in a text, the cognitive load is quite low (Basaraba, Yovanoff, Alonzo & Tindal, 2013). The fluency of these literal reading strategies into skills builds the foundation for the teaching of inferential and critical reading strategies (Kintsch & Rawson, 2005; Nation, 2005). In understanding the importance of this research the **Reading Eggspress Comprehension program** has structured many literal comprehension strategies in the early stages of the program. Explicit teaching and repetition is designed to craft a solid base from which more complex strategies can be built upon.

Inferential and critical reading strategies demand more from the reader as they require more complex levels of understanding. Inferential comprehension entails students to look at information in a text and search for the relationships and details to find connections (Basaraba et al., 2013; Carnine et al., 2010). Critical understanding looks at extending the strategies of inferential understanding to evaluate texts using divergent thinking, critical analysis, synthesis, and evaluation (Vacca, Vacca, Gove, Burkey, Lenhart, & McKeon, 2009). These more complex strategies are gradually introduced into the **Reading Eggspress Comprehension program** so that students build deeper understanding, make connections and explore more rigorous readings of texts.

Literature and nonfiction texts

A balance between literature and nonfiction texts is crucial for a rich language program. Research acknowledges that literature and nonfiction texts have different purposes, structures and therefore require different skills for reading comprehension (Best, Floyd, McNamara, 2008; Eason, Goldberg, Young, Geist, Cutting, 2012). The findings of Eason and her peers revealed that children's comprehension is not identical across all types of text and question types. Teachers need a clear picture of how children comprehend texts across text type, genre and subject area. They also need to know how their students' are responding to different question types. In the **Reading Eggspress Comprehension program** each of the *My Lessons* map of five lessons is focused on either all nonfiction text samples or all literature text samples. Teachers can view a breakdown to see how students perform in each area and across different question types in the detailed reports.

Each of the *My Lessons* maps also includes a focus text, a complete text that students read in its entirety. These inform the artwork of the map and provide a contextualised reading of extended text. These e-books are included to help build students' reading fluency, increase the total number of words they read and improve motivation. When used in a classroom setting, these e-books also become part of the shared experience of a group of students, as books that are read and enjoyed at the same time. Reading and discussing books, stories and ideas with peers, teachers and other students is one of the most enjoyable facets of reading for pleasure, thus increasing reading enjoyment and improving students' motivation to read.

Complexity

Measuring text complexity or readability is not a new idea with estimations that since the 1920s more than 100 readability formulas have been researched, constructed and implemented in school reading programs (Gunning, 2003). In recent years there has been a focus on a select few readability formulas. Fisher & Frey (2014a; 2014b) explain the strengths of these quantitative measures to inform decision-making. They stress alongside readability, the content needs to be age-appropriate, interesting and relevant. Finding the right balance can be challenging to align all of these elements.

The **Reading Eggspress Comprehension program** uses the Lexile measure, a framework created by

MetaMetrics to facilitate a common scale and metric for measuring reading ability and readability of text (Harvey, 2011). It is one of the most common quantitative measures used for text complexity (Fisher & Frey, 2014b) with millions of published books now including a Lexile level. Each text in the **Reading Eggspress Comprehension program** has been independently measured using the quantitative measure of Lexile and then assigned an appropriate *Reading Eggs Reading Level* by a panel of literacy consultants. This *Reading Eggs Reading Level* also takes into consideration qualitative measures such as age appropriateness and content. The Lexile framework ensures the consistent gradual increase in text complexity within the **Reading Eggspress Comprehension program**. Using a validated independent model of measurement for text complexity provides comparable data sets for the gains shown within the program. This also means that finding additional reading materials at the right level within the *Reading Eggspress Library* is easy to do, as all *Reading Eggspress Library Books* include a Lexile level.

Comprehension components

Explicit

Torgesen (2004) described explicit instruction as "instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own" (p.363). The challenges teachers face in trying to implement comprehension strategies is well-documented, as the area is complex and requires detailed planning and large quantities of time (van Keer, 2004; Ness, 2011). Results from these studies highlight the complex and time consuming role reading comprehension instruction poses in the planning, assessment and reteaching required.

Technology

Classrooms are investing more in technology and emerging pedagogical research supports the role of computer technology in aiding comprehension development (Lysenko & Abrami, 2014; Ponce et al.; 2012). There is evidence that using a computer-based strategy instruction with elementary school students adds value beyond the limits of traditional classroom practice (Ponce et al., 2012, p.1182). Targeted computer technology can also help teachers use their time more purposefully (Lysenko & Abrami, 2014).

Metacognition

For students to transfer comprehension skills, teaching the why and when for strategies is as important as the how. This metacognitive thinking needs to be activated to enable the transfer of skills from one text to many others. Equipping students in this way helps them view these strategies as tools to assist with meaning construction, as opposed to tasks completed at a teacher's request (Gersten, Fuchs, Williams, & Baker, 2001; Hollenbeck & Saturnus, 2013). Without careful instruction on why and when to apply strategies, students find it difficult to generalise what they have learned in tasks to new tasks beyond comprehension training exercises (Atkins, 2013).

The **Reading Eggspress Comprehension program** uses a range of teaching videos that explicitly model a specific strategy. Students then practise and implement these skills in short interactive activities that reinforce the active use of a specific strategy. These strategy videos and skill building activities build upon one another and give students insight into the processes comprehension experts undergo when they approach reading a new text. As strategies are transformed into fluent skills, more challenging texts are introduced in the program in line with current research on extending comprehension knowledge (Afflerbach, et al., 2008). This research also suggests revisiting key strategies as their scope and complexity allows them to be retaught for extra depth.

The **Reading Eggspress Comprehension program** focuses on literal, inferential and critical reading comprehension questions for skill building and metacognitive understanding. The program centres on questions that address key areas in comprehension - main idea and details; compare and contrast; making connections; sequencing events; cause and effect; understanding character; drawing conclusions; predicting; summarising; fact and opinion; point of view; and word study. Each skill is repeated many times to build each student's ability to transfer these skills and for them to become an integral part of their repertoire of their reading comprehension skills.

Motivation

Reading comprehension is influenced by a range of factors affecting students' motivation to reading (Guthrie, Hoa, Wigfield, Tonks, Humenick, & Littles, 2007; Miller & Faircloth, 2009). In the work of Guthrie and his colleagues,

they discovered students outlined being knowledgeable as an explicit goal of reading (2007). The research highlights the power of this goal for motivation and the **Reading Eggspress Comprehension program** explains the metacognitive strategies to students to ensure they feel knowledgeable in their reading.

An additional factor in motivation is interest in a text's content which is associated with high cognitive recall and comprehension of text (Guthrie et al., 2007). Where students are interested and engaged they are more likely to have higher cognitive recall. The **Reading Eggspress Comprehension program** has curated texts across a wide range of content and genres to ignite motivation for the widest group possible.

Ongoing formative assessment

The purpose of meaningful classroom assessment is to give teachers feedback about student performance (Torgenssen & Miller, 2009). The **Reading Eggspress Comprehension Program** integrates assessment into every stage of the program. The end-of-lesson quizzes provide important information about student progress with reports showing a breakdown of student results to different question types ranging from literal and inferential to whole text responses. Every five lessons, students also complete an assessment task that is in a similar format to standardised national online tests. Each assessment task is consistent across the 44 levels of the program and uses a text with an independent Lexile level and 10 questions.

Using the results of these assessment tasks, teachers can clearly see growth over time in their students' reading comprehension of both literature and nonfiction texts. Assessment reports show both Lexile growth and improvements in students' abilities to deepen their comprehension abilities beyond the literal to access deeper levels of meaning, make connections and use an ever increasing vocabulary. As students progress through the program they complete lessons with increasingly complex texts and answer questions that require close reading and deeper understanding. Using the results of assessments teachers can redirect students to particular lessons to build their knowledge of a comprehension strategy. Teachers can also compare a student's proficiency in literature and nonfiction texts, as students may have different abilities in each of these domains. Ongoing assessment is a powerful tool for personalising the teaching and learning cycle within a classroom.

Conclusion

There is a broad research base that supports the explicit teaching of reading comprehension strategies to improve student outcomes in the complex task of reading comprehension. As students progress through primary school and move beyond 'learn to read' to 'read to learn', they encounter texts with ever increasing complexity. This text complexity comes from a range of areas that include thousands of new words across the different content areas; understanding technical, scientific and historical processes; to the challenging ideas found in literature and poetry. Many students struggle with the increased conceptual load and cognitive demands of these texts.

The **Reading Eggspress Comprehension program** provides a comprehensive and systematic program of comprehension strategy instruction that models, scaffolds and supports student learning in an online environment that is rewarding and motivational. With technology usage growing in the classroom, studies show that online software programs can benefit literacy skills and that teachers need programs that can be tailored to the individual needs of each student. The **Reading Eggspress Comprehension program** effectively allows teachers to assign lessons, monitor growth and assess student progress for the many and varied needs of the students within their classroom.

References

- Afflerbach, P., Pearson, P.D., & Paris, S.G. (2008). Clarifying differences between reading skills and reading strategies. *The Reading Teacher*, 61, 5, 364–373.
- Atkins, J. G. (2013). *The effect of explicit teaching of comprehension strategies on reading comprehension in elementary school*. Unpublished Ph.D., Columbia University.
- Basaraba, D., Yovanoff, P., Alonzo, J. & Tindal, G. (2013). Examining the structure of reading comprehension: Do literal, inferential, and evaluative comprehension truly exist? *Reading and Writing*, 26, 3, 349-379.
- Beck, I. L., Perfetti, C. A., & McKeown, M. G. (1982). The effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology*, 74, 506-521.
- Beers, K. & Probst, R. E. (2013). *Notice & note: Strategies for close reading*. Portsmouth, NH: Heinemann.
- Best, R. M., Floyd, R. G., & McNamara, D. S. (2008). Differential competencies contributing to children's comprehension of narrative and expository texts. *Reading Psychology*, 29, 137–164.
- Carnine, D. W., Silbert, J., Kame'enui, E. J., & Tarver, S. G. (2010). *Direct instruction reading* (5th ed.). Boston, MA: Merrill.
- Connor, C. M., Phillips, B. M., Kaschak, M., Apel, K., Kim, Y., Al Otaiba, S., Crowe, E. C., Thomas-Tate, S., Johnson, L. C., Lonigan, C. J. (2014). Comprehension tools for teachers: Reading for understanding from prekindergarten through fourth grade. *Educational Psychology Review*, 26, 379-401.
- Dignath, C. & Büttner, G. (2008). Components of fostering self-regulated learning among students: A meta-analysis on intervention studies at primary and secondary school level. *Metacognition & Learning*, 3, 231-264.
- Duffy, G. G. (2009). *Explaining reading: A resource for teaching concepts, skills, and strategies* (2nd ed.). New York: Guilford Press.
- Duke, N. K. & Pearson, P. D. (2002). Effective practices for developing reading comprehension. In A. E. Farstrup & Samuels S. J. (3rd Eds.) *What Research Has to Say About Reading Instruction*. International Reading Association: USA.
- Eason, S. H., Goldberg, L. F., Young, K. M., Geist, M. C., Cutting, L. E. (2012) Reader–text interactions: How differential text and question types influence cognitive skills needed for reading comprehension. *Journal of Educational Psychology*, 104, 3, 515–528.
- Fisher, D., & Frey, N. (2012). Close reading in elementary schools. *The Reading Teacher*, 66, 179-188.
- Fisher, D. & Frey, N. (2014a). Addressing CCSS anchor standard 10: Text complexity. *Language Arts*, 91, 4, 236-250.
- Fisher, D. & Frey, N. (2014b) Understanding and teaching complex texts. *Childhood Education*, 90, 4, 306-313.
- Gersten, R., Fuchs, L. S., Williams, J. P., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of Educational Research*, 71, 2, 279-320.
- Gough, P. B. & Tunmer, W. (1986). Decoding, reading and reading disability. *Remedial and Special Education*, 7, 6–10.

- Graves, M. F. (2000). A vocabulary program to complement and bolster and middle-grade comprehension program. In B. M. Taylor, M. F. Graves & P. van den Broek (Eds.), *Reading for meaning: Fostering comprehension in the middle grades* (pp.116-135) Teachers College Press: New York.
- Gunning, T. G. (2003). The role of readability in today's classrooms. *Topics in Language Disorders*, 23, 175–189.
- Guthrie, J. T., Hoa, A. L. W., Wigfield, A., Tonks, S. M., Humenick, N. M., & Littles, E. (2007). Reading motivation and reading comprehension growth in the later elementary years. *Contemporary Educational Psychology*, 32, 282–313.
- Harvey, C. A. (2011). An inside view of Lexile measures: An interview with Malbert Smith III. *Knowledge Quest: Reversing Readericide*, 39, 4, 56-59.
- Hollenbeck, A. F. & Saturnus, K. (2013). Mind the comprehension iceberg: Avoiding titanic mistakes with the CCSS. *The Reading Teacher*, 66, 7, 558–568.
- Kamil, M. L., & Chou, H. K. (2009). Comprehension and technology. In S.E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 289-304). Mahwah, NJ: Erlbaum.
- van Keer, H. (2004). Fostering reading comprehension in the fifth grade by explicit instruction in reading strategies and peer tutoring. *British Journal of Educational Psychology*, 74, 37-70.
- Kintsch, W., & Rawson, K. A. (2005). Comprehension. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 209–226). Oxford, MA: Blackwell.
- Lysenko, L. V. & Abrami, P. C. (2014). Promoting reading comprehension with the use of technology. *Computers & Education*, 75, 162-172.
- Miller, S.D., & Faircloth, B.S. (2009). Motivation and reading comprehension. In S.E. Israel & G.G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 307–322). New York: Routledge.
- Muter, V., Hulme, C., Snowling, M. J. and Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: Evidence from a longitudinal study, *Developmental Psychology*, 40, 665-681.
- Nation, K. (2009). Reading comprehension and vocabulary: What's the connection? In R. K. Wagner, C. Phythian-Sence, C. Schatschneider (Eds.), *Beyond Decoding: The Behavioral and Biological Foundations of Reading Comprehension* (pp. 176-194). New York: Guilford Press.
- Nation, K. (2005). Children's reading comprehension difficulties. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 248–265). Oxford, MA: Blackwell.
- Ness, M. (2011). Explicit reading comprehension instruction in elementary classrooms: Teacher use of reading comprehension strategies. *Journal of Research in Childhood Education*, 25, 1, 98-117.
- Ponce, H. R., López, M. J., Mayer, R. E. (2012). Instructional effectiveness of a computer-supported program for teaching reading comprehension strategies. *Computers & Education*, 59, 1170-1183.
- Reutzel, D. R., Child, A., Jones, C. D., Clark, S. K. (2014). Explicit instruction in core reading programs. *The Elementary School Journal*, 114, 3, 406-430.
- Ricketts, J., Cocksey, J., Nation, K. (2011). Understanding children's reading comprehension difficulties. In S. Ellis & E. McCartney (Eds.), *Applied Linguistics and Primary School Teaching* (pp. 154-164). Cambridge: Cambridge University Press.
- Slavin, R. E., Lake, C., Chambers, B., Cheung, A., Davis, S. (2009). Effective reading programs for the elementary grades: A best-evidence synthesis. *Review of Educational Research*, 79, 1391- 1466.
- Torgesen, J. K. (2004). Lessons learned from research on interventions for students who have difficulty learning to read. In P. McCardle & V. Chhabra (Eds.), *The Voice of Evidence in Reading Research* (pp. 355–382). Baltimore: Brookes.
- Torgesen, J. K., & Miller, D. H. (2009). *Assessments to guide adolescent literacy instruction*. Portsmouth: RMC Research Corporation, Center on Instruction.
- Vacca, J. L., Vacca, R. T., Gove, M. K., Burkey, L. C., Lenhart, L. A., & McKeon, C. A. (2009). *Reading and learning to read* (7th ed.). Boston, MA: Pearson.