BES Exemplar 4
Ngā Kete Raukura – He Tauira 4
Reciprocal teaching

This is the fourth of a series of exemplars being prepared for Quality Teaching for Diverse (All) Learners in Schooling: Best Evidence Synthesis Iteration [BES]

He Ako Reikura, He Ākonga Rerekura (Te Katoa): Hei Kete Raukura [BES]

This publication, currently in development, is a second iteration of *Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis [BES]* (2003).

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Background to BES Exemplar 4: Reciprocal teaching

BES Exemplar 4, 'Reciprocal teaching' illustrates a teaching approach that builds thinking skills and accelerates reading comprehension, resulting in significant improvements within a relatively short period of time. The approach also trains students to collaborate in their learning.

BES exemplars celebrate and support teachers' work

This exemplar features six studies by New Zealand educators in primary, intermediate, and secondary schools. These studies show how reciprocal teaching has been highly effective with Māori and Pasifika students, low-achieving students, students with special needs, and English language learners. Together, they show how reciprocal teaching can support learning across the curriculum in both whole-class and tailored small-group settings. The students featured in the exemplar read print text, but reciprocal teaching can also be used with digital texts.

Reciprocal teaching supports teachers' work by developing students' autonomy and their ability to support each other's learning. When working well, it gives teachers time to observe students and diagnose their learning needs while others are productively engaged. It has potential for supporting learning across the curriculum. The exemplar also shows how teacher aides have been trained to support teachers' work in ways that advance valued outcomes for students.

The success of reciprocal teaching depends upon effective implementation and strategic use. Poor implementation can result in a rote activity that wastes learning time. This exemplar addresses implementation challenges, especially at secondary level.

Addressing areas of need

Reading comprehension can be a challenge for students across the curriculum, but especially when subject-specific information is above the students' chronological reading level. Reciprocal teaching provides a way to address this challenge.

The exemplars are designed to show teachers addressing teaching and learning issues that we know are areas of need across New Zealand schools. National Education Monitoring Project (NEMP) findings have shown a 2% deterioration in reading comprehension at year 4 (2004 to 2008)[1] and a 2% decline in the ability to think about and use information at year 8 (2005 to 2009).[2] While our highest achievers do very well, international comparisons show wide disparities in literacy, with 8% of primary students not reaching the low international benchmark in the Progress in Reading Literacy Study (PIRLS).[3]

The exemplar shows reciprocal teaching to be very effective for Pasifika students. Pasifika students are one of the target groups successive governments have prioritised for greater educational success. The percentage of 15-year-old Pasifika students who are beneath the low international benchmark (Level 2) in New Zealand's results on the Programme for International Student Achievement (PISA)[4] has not been decreasing.[5]

PISA analyses of the impact of low socio-economic status on reading achievement[6] show that New Zealand schooling is less able to mitigate negative effects of low socio-economic status than many other countries. It is significant, therefore, that reciprocal teaching has been shown to accelerate progress for very low achievers in low-decile schools.

The Trends in International Mathematics and Science Study (TIMSS)[7] found that New Zealand students feel more unsafe in the peer culture at school than do students in 30 out of 32 participating countries. This is a longstanding pattern. Reciprocal teaching not only accelerates achievement but also counters bullying and strengthens social relationships in the classroom. It does this by equipping students with the skills to engage in more thoughtful, co-operative, and productive classroom interactions.

Acknowledgments

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1   Crooks, T., Smith, J., & Flockton, L. (2008). *Reading and speaking: Assessment results 2008*. (Report No. 49). Wellington: Ministry of Education.

2   Smith, J., Crooks, T., & Allan, R. (2009). *Information skills for inquiry learning: Assessment results 2009.* (Report No. 52). Wellington: Ministry of Education.

3   Chamberlain, M. (2006). *Reading literacy in New Zealand: an overview of New Zealand's results from the progress in international reading literacy study (PIRLS) 2005/2006.* Wellington: Research Division, Ministry of Education.

4   OECD (2010). *PISA 2009 at a glance.* OECD Publishing. Retrieved from http://dx.doi.org/10.1787/9789264095298-en

5   Rather, the percentage of Pasifika students who did not have the baseline reading competencies necessary for effective and productive participation in life (that is, below PISA's Level 2 proficiency level) increased from 31% in 2006 to 35% in 2009. Although this was not a significant difference, it is an indicator of concern.

6   OECD (2010). *PISA 2009 results: Learning trends: Changes in student performance since 2000* (Volume V, pp. 48-49). OECD Publishing. Retrieved from http://dx.doi.org/10.1787/9789264091580-en

7   Mullis, I., Martin, M. O., & Foy, P. (2007). TIMMS 2006 international science report: Findings from IEA's trends in mathematics and science study at the fourth and eighth grades. In collaboration with J. F. Olson, C. Preschoff, E. Erberber, A. Arora, & J. Galia (Eds.), *Index of students' perception of being safe in school (SPBSS) and trends,* (pp. 336–367). United States: TIMSS & PIRLS International Study Center.

About the BES exemplars

This new series of BES exemplars is being prepared by the Iterative Best Evidence Synthesis (BES) Programme. Each exemplar has been selected because it illuminates highly effective teaching approaches that accelerate progress for diverse (all) learners in areas where improvement is needed. They exemplify the eleven dimensions of quality teaching using examples that come from across the curriculum and are relevant to primary, intermediate, and secondary levels of schooling.

The series has been given priority in response to requests from teachers and principals for real-life examples that make transparent the nature of highly effective teaching and the professional learning, leadership, and educationally powerful connections with families, whanāu, and communities that support such teaching. The exemplars are derived, where possible, from research and development carried out in New Zealand schools and kura. They celebrate the outstanding work of New Zealand educators.

While the BES exemplars show how significant improvements can be made through teaching, they are not 'magic bullets'. Rather, the exemplars illuminate the high-impact research and development that informed and developed the expertise of the teachers, facilitators, school leaders, and researchers they feature.

The BES exemplars are being progressively released online. They will be a core resource for the forthcoming:

> Quality Teaching for Diverse (All) Learners in Schooling: Best Evidence Synthesis Iteration [BES] He Ako Reikura, He Ākonga Rerekura (Te Katoa): Hei Kete Raukura [BES].

This publication, currently in development, is a second iteration of *Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis [BES]* (2003). For updates on progress, go to the BES website at www.educationcounts.govt.nz/goto/BES

While teachers are the primary audience for these BES exemplars, they are also intended as a resource for leaders, policy makers, and all those involved in supporting the work of teachers. To support their use in a variety of contexts, each exemplar incorporates the following features:

- A section on background information explains the significance of the exemplar. It highlights the expertise of the educators that enabled accelerated improvement and identifies the area of national need that they addressed in their work. You may prefer to read the exemplar before reading this background information.
- A list of supporting resources is provided for those who wish to investigate further. Full text copies of cited articles can be requested from the BES website.
- A 'Professional learning: Starter questions' tool is intended to support schools seeking to use the exemplars as catalysts for improvement. Specifically, it is intended to support an inquiry and a knowledge-building approach to improvement that is responsive to the unique needs of the students, teachers, and wider community in each context.
- An 'Implementation alerts' checklist highlights the complexity of change for improvement, emphasising the fact that 'how' change happens and is supported is critical to success.

The pedagogical approaches explained in these exemplars do need, of course, to be appropriately integrated into a comprehensive plan for improving teaching and learning.

Feedback to inform BES development

We will draw upon your feedback when finalising the exemplars for this new BES iteration. Please send any feedback to best.evidence@minedu.govt.nz

BES Exemplar 4. Reciprocal teaching

Sources	
	Fung, I., Wilkinson, I., & Moore, D. (2003). L1-assisted reciprocal teaching to improve ESL students' comprehension of English expository text. *Learning and Instruction*, *13*, pp. 1–31. Available from www.uta.fi/aktkk/lectures/kttp_en/articles/01_2003_Fung.pdf
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	Westera, J. (2002). *Reciprocal teaching as a school-wide inclusive strategy*. Unpublished doctoral dissertation, University of Auckland, Auckland. Available from http://hdl.handle.net/2292/767 or www.educationcounts.govt.nz/goto/BES
	....
	Full text copies of cited articles can be requested by New Zealand schools through the Ministry of Education's Research Behind BES service: www.educationcounts.govt.nz/goto/BES

Introduction	
	Reciprocal teaching is a way of explicitly teaching reading comprehension. It involves four 'thinking skills': clarifying, questioning, summarising, and predicting. Teachers coach their students one skill at a time until they are themselves able to lead small groups. All students take turns at leading their group. This requires teachers to explicitly model the thinking skills, provide clear feedback, and provide repeated opportunities for practice.

Reciprocal Teaching

* ' I am the teacher.'   'Would you please read to ..... '

* Clarifying   ' Does anyone need anything **clarified**? '
                  ' Is there anything you would like to ask? '
                  ' I'd like to know what ...... means.'
                  ' What is this word? '

* Questioning   ' My **question** is ...... '
                      What Where When Which
                      Why Who How

* Summarising   ' This paragraph is about ..... '
                  ' Would you please **summarise** for us ..... '
                  ' My **summary** is ..... '

* Predicting   ' I **predict** that ..... will happen next '
                  ' I think that the next part will be about .... '

* 'Can you be the next 'teacher' please ..... '

Figure 1. Reciprocal teaching prompts

When well implemented, reciprocal teaching has been shown to improve students' skills in reading comprehension, metacognition, social participation, and self-management. It is a strategy that is user-friendly for both teachers and students, yet has a high impact after a relatively short period of use. With long-term use, reciprocal teaching can support ongoing achievement gains, particularly if implemented across learning areas in ways that promote deep learning.

While reciprocal teaching is a very high-yield strategy, it should not be seen as a comprehensive literacy or learning programme. Instead it should become an integrated component of a balanced teaching and learning programme. Because of its potential to strengthen peer learning and learning-to-learn skills, it can be especially effective when used at the start of the school year.

Hattie[1] investigated the impact of reciprocal teaching on reading comprehension across 38 studies in two meta-analyses. He found an overall effect size of $d = 0.74$ and ranked reciprocal teaching the third highest-impact strategy out of 49 teaching strategies.

This exemplar focuses on six highly effective implementations of reciprocal teaching in New Zealand primary, intermediate, and secondary schools.

Because of the detailed information available about methodology and sustainability, this exemplar pays closest attention to an intervention led by school psychologist, Julia Westera. The purpose of this intervention was to strengthen reading comprehension across the curriculum for low-achieving year 9 students. Westera established a professional leadership planning group to lead the intervention, and those involved took a cyclical inquiry approach to the professional learning. Since the original study, the school has run a modified form of reciprocal teaching involving all teachers of year 9 and 10 students (with the exception of mathematics teachers[2]) for over six years. The intervention is part of the school's commitment to improving students' achievement and behaviour and building a school-wide inclusive culture.

Five other New Zealand interventions inform this exemplar, four of them carried out by students of Professor Dennis Moore during the period he was at the University of Auckland:

- Ann Gilroy implemented a reciprocal teaching intervention with ten year 6, 7, and 8 Pasifika girls with low reading comprehension.
- Marie Kelly investigated the use of reciprocal teaching as business-as-usual by two teachers in a high-decile primary school.
- Irene Fung led an intervention with new immigrant Taiwanese students in years 7 and 8, in which she alternated the use of reciprocal teaching in Mandarin and English.
- Deidre Le Fevre was an itinerant teacher of special needs who adapted reciprocal teaching for a group of year 5 to 8 students with poor reading skills. Le Fevre incorporated audio-recordings that the students listened to as they read.
- In a recent study, Samantha Smith adapted reciprocal teaching for use with year 9 students in a large multi-cultural secondary school. This intervention is known as 'The New Zealand High School Communication Skills Programme'. Smith made two adaptations. One was the introduction of an additional strategy for enabling students to make connections with their prior knowledge. The other was the provision of training to teacher aides so that they could provide students with continuous scaffolding.

The range of these studies is consistent with evidence that shows reciprocal teaching to be effective with a wide range of students in culturally diverse classes in primary and secondary schools (and even with post-secondary students at risk of academic failure). It remains effective when adapted for use with pre-readers, students with both limited comprehension and limited decoding skills, English language learners, and students with specific learning difficulties (such as a language or hearing impairment or a mild-to-moderate intellectual disability). Reciprocal teaching has been used as a step towards the development of wider learning and thinking communities in schools serving diverse students from families of low socio-economic status. It can be a 'catch-up' strategy, but its effectiveness commends it for use with all students when appropriate.

For teachers and schools, reciprocal teaching is a way of 'working smarter not harder'. When students are coached effectively and become confident in using the skills, they can continue to learn together. Their increased independence frees the teacher to provide scaffolding where it is most needed.

Appendix B (BES Exemplar 4 implementation alerts) highlights what does and doesn't work to optimise effectiveness and the resource section suggests resources that are useful when implementing reciprocal teaching.

Learners and learning context	The studies took place in a range of school contexts. We describe each context to help teachers and leaders explore optimal ways to implement reciprocal teaching in their own schools.

Year 9 (Westera)

Westera's study was conducted in a decile 4 Auckland secondary school with a diverse student population of which 10 percent were English language learners (students for whom English is an additional language). The 35 students who took part in the reciprocal teaching programme were selected from five classes. All had low reading comprehension, and 30 percent were of Māori and Pasifika ethnicity.

Four teachers and two support staff implemented the reciprocal teaching in the participating students' English and social studies classes. The students worked in groups of three to six. (One review found that four or five students is the optimal number for group functioning.[3]) Their teachers were provided with around three hours of professional development, as well as some ongoing support and feedback.

Westera used a quasi-experimental design. Fifteen students took part in a short intervention of six to eight reciprocal teaching sessions. Their results were compared with 20 students who took part in an extended intervention of 12–16 sessions. Eleven students from two other classes made up a 'no treatment' comparison group.

Whole year 9 cohort (Smith)

Smith's New Zealand High School Communication Skills Programme involved an entire year 9 student cohort in a large, multicultural decile 6 school. The students were 39% New Zealand European, 21.4 % Māori, 23.4 % Pasifika, and 16.3 % Asian.

Teacher aides were trained to scaffold the groups of students through 15 sessions spread over five weeks. Each session lasted around 25 minutes. The teacher aides followed the following sequence: Step 1: Discuss and prompt for prior knowledge; Step 2: Read and question; Step 3: Deeply question; Step 4: Clarify; Step 5: Summarise; and Step 6: Predict.

AsTTle pre- and post-intervention gain scores for deep and surface features of reading comprehension were used across the programme and in six comparison schools.

Year 7 and 8 Taiwanese students (Fung)

Four year 7 and 8 students from each of three suburban schools took part in Fung's intervention. These 12 students had been reading at grade level in Chinese Mandarin in Taiwan, but were four to six years behind their chronological age in English reading. They took part in reciprocal teaching in English and Mandarin on alternating days. (They were taught by Fung who is a fluent speaker of Mandarin.)

Year 6, 7, and 8 Pasifika students (Gilroy)

In Gilroy's study, three year 6, three year 7, and four year 8 Pasifika students in a full primary school were scaffolded into the use of reciprocal teaching over 21 days of 20–25 minute sessions. Initially, all these students were decoding at their age level but some were two years behind their age levels in their reading comprehension.

Eighteen students formed comparison groups. These students' reading comprehension scores were either average (nine students were between the 45th to 65th percentiles on the PAT) or above average (nine students were highest in their class for reading comprehension).

Year 5 and 6 students (Kelly)

Kelly's research into the business-as-usual use of reciprocal teaching in an urban primary school involved 18 year 5 and 6 students from two composite classes. Their initial reading comprehension levels were from six months to two years below their chronological age.

Year 5 and 6 students: Tape-assisted reciprocal teaching (Le Fevre)

Le Fevre's tape-assisted intervention took place in three suburban primary schools with predominantly Māori and Pasifika student populations. It involved 18 students in years 5 and 6. Initially, nine of these students had reading comprehension and accuracy levels two years below their chronological age. The other nine had average accuracy levels but comprehension levels that were from 18 months to two years below their chronological age.

Outcomes

Reading comprehension

'Effect size' is a statistical measure of the impact of an intervention on an outcome. Hattie[4] shows that the average yearly effect of teaching in New Zealand in reading, mathematics, and writing from year 4 to year 13 is d = 0.35. Effect sizes above 0.40 represent an improvement on business-as-usual and effect sizes of d = 0.60 are considered large.

Year 9 (Westera)

The achievement gains for the students in the extended reciprocal teaching programme were far greater after just 12–16 sessions than business-as-usual gains for a year's teaching. The gain in PAT reading comprehension scores showed a large effect size of $d = 1.1$. These students gained an average of more than one year on reading comprehension: from the 7th to the 21st percentile on PAT results. These gains were maintained over the following three months.

The number of reciprocal teaching sessions experienced by students was critical. The students in the control group and in the short intervention (six to eight sessions) showed no significant gain.

Whole year 9 cohort (Smith)

The New Zealand High School Communication Skills Programme resulted in effect sizes of $d = 2.59$ across the cohort for achievement on deep features of reading comprehension and $d = 0.30$ for surface features; an overall effect size of $d = 1.55$. (Surface level responses require understanding of separate ideas and facts; deep responses require readers to use inference, integrate their understanding of facts and ideas, and extend their thinking.[5]) This improvement occurred for students with different levels of prior achievement, for boys and girls, and for students of different ethnicities. And it occurred after just 15 sessions with the teacher aides who were trained to implement the intervention.

Year 7 and 8 Taiwanese students (Fung)

The year 7 and 8 students whose reciprocal teaching sessions were conducted alternately in Mandarin and English took part in 15–20 one-hour sessions over four to five school weeks. They achieved a mean increase of 12 months in English reading comprehension and 12 months in reading accuracy, as measured on a standardised test. Fung found that they were able to transfer their comprehension and monitoring strategies to a novel task. The overall effect sizes for English reading gains in this intervention were $d = 0.89$ for reading comprehension and $d = 0.72$ for reading accuracy.

	Year 6, 7, and 8 Pasifika students (Gilroy)
	All the Pasifika students who took part in this reciprocal teaching intervention made accelerated gains when compared with peers who had been achieving more highly at the outset. The effect sizes for this intervention were higher than for any other study we located. After adjusting for sample size, a conservative measure of the gains ranged from $d = 3.8$ to $d = 4.0$ after only 21 days of implementation. After the intervention, their reading comprehension surpassed that of their average-achieving peers to be consistent with that achieved by the above-average group.
	Year 5 and 6 students (Kelly)
	The year 5 and 6 primary students in the business-as-usual intervention involving 20 sessions made more than 12 month's gain in reading comprehension. This gain was maintained and the students were able to transfer their learning from non-fiction to fiction text. The students' PAT scores showed that one of the classes that used reciprocal teaching achieved an effect size gain of $d = 2.57$. For the second class, the effect size was $d = 1.60$. No such gains were evident for the comparison group, who read the same texts but took part in business-as-usual reading activities.
	Year 5 and 6 students: Tape-assisted reciprocal teaching (Le Fevre)
	In the first part of her study, Le Fevre used reciprocal teaching without tape-assisted support. For the poor decoders, the effect size for reading comprehension gain over this brief intervention was $d = 0.65$. For the adequate decoders (whose decoding was at chronological age but reading comprehension 18 months behind), the effect size was $d = 3.27$. This is a very large gain for a short intervention.
Other valued outcomes	In the second part of her study, Le Fevre introduced tape-assisted reciprocal teaching. The gains achieved from this adaptation were no larger for the adequate decoders, but it had a big impact on the poor decoders. Following 10 tape-assisted sessions, these students achieved marked increases in comprehension, with an effect size of $d = 1.75$. Le Fevre concluded that the tape-assisted reciprocal teaching provided *"cognitive boot-strapping* to enable poor readers to escape the cycle of reading failure and engage more meaningfully in the process of reading"* (p. 38). The tapes gave these students access to age-appropriate texts. Le Fevre commented that students who had been labelled as having special needs no longer carried that label after the intervention. The reciprocal teaching intervention was also highly influential in changing a pattern of disruptive behaviour in the poor decoders. This shows that reciprocal teaching, implemented well, can help to counter knowledge deficits across the curriculum associated with poor reading.
	In Westera's study, teachers reported increased self-directed learning, more confident and open attitudes, and even improved attendance from the low-achieving students. There was some evidence of the effect being generalised. Teachers felt that their relationships with the reciprocal teaching students had improved, and were delighted when some began to ask for clarification in the whole class context. A recurrent finding across the studies is that students take increased pleasure in reading, not just in school but also at home.
	Marie Kelly documents a range of evaluation comments from students after experiencing reciprocal teaching:
	Year 5 student: It helps me understand what I'm reading, and it's fun to share the story with other people … I can read harder books.
	Year 6 student: I used to think I was dumb; now I know I am not.
	Year 7 English language learner: [Reciprocal teaching is] easy for people to understand. We think people who aren't good at reading should try this reciprocal teaching because it is very easy for you.
	Year 8 English language learner: I like this stuff, as it makes me think about the different ways of words and it has made a big difference when I read books.
Curriculum relevance[6]	Reciprocal teaching:
	• improves reading comprehension, a skill that is fundamental to access to the curriculum and lifelong learning;
	• increases deep comprehension and learning skills;
	• improves literacy levels;
	• can support students to learn specialised vocabulary, listen and communicate, read critically for a range of purposes in each learning area, and cope with difficult reading materials;
	• builds student capability in all five of the key competencies: thinking; using language, symbols, and texts; managing self; relating to others; and participating and contributing;
	• is readily incorporated into most learning areas;
	• can provide opportunities for mana tangata (development of self-esteem through contributing), mana motuhake (development of independence and autonomy), and mana reo (development of communication);
	• fosters positive and inclusive peer learning communities.

The Quality Teaching Dimensions

Opportunity to learn

Kapohia, akona

Opportunity to learn is effective and efficient.

Reciprocal teaching takes place in a small group context. Teacher and students take turns at being 'teacher' or leading the dialogue while focusing on defined segments of a shared text. The teacher role is rotated among group members to ensure each has a turn each session.

The person in the teacher role structures the dialogue by selecting the length of the passage to be read silently. They then ask for points to be clarified from the text, generate a question on the content of the text to which group members respond, summarise the text segment in their own words, and predict the content of upcoming text. If reciprocal teaching is used ritualistically, without careful teacher scaffolding, then the potential opportunity to learn will be lost. Scaffolding should including modelling the four thinking skills and focusing student attention on the deeper meaning of text.

The role of the four thinking skills in creating the opportunity to learn is explained below:

Clarifying

Clarifying moves students' attention from decoding to comprehension and helps them recognise when their understanding has broken down. When a student recognises comprehension failure, they can do something about it. Students are taught to focus on unfamiliar or new words, new or difficult ideas, unfamiliar passages or paragraphs, and loss of meaning. They are encouraged to use 'fix-up' skills (for example, rereading, checking with others about the meaning, using a dictionary, atlas, or other resource, asking for help, or asking if others need anything clarified).

Questioning

Questioning focuses reading, can work as a means of self-testing for students, and involves students more actively in reading activity. Reciprocal teaching gives students opportunities to identify the kind of information that provides the basis of a good question (as modelled by the teacher), develop a question, find the information that will enable them to answer their question, and help other students to answer questions.

Summarising

Summarising helps students to identify important content by finding key words and topic sentences, separating out detail and repetition from the main ideas, and integrating information across paragraphs. This activity requires students first to identify the most important content of the paragraph or section of text, and then to integrate important information in the whole passage with the guidance of the teacher. Summarising is a useful skill for remembering, studying, and self-review.

Predicting

Predicting is a form of preparation for reading comprehension. It provides a purpose for reading and an opportunity to link new ideas to prior learning. Prediction helps students to anticipate and use cues from the text such as the title, illustrations, subtitles, and diagrams in order to find meaning within the print. Students learn to hypothesise what the author will discuss and then confirm or disprove their hypothesis.

Reciprocal teaching involves repeated practice, providing more opportunities for students and the group to manage their own learning and for teachers to focus on explicitly scaffolding students into developing higher thinking and social skills.

It is notable that the large gains achieved by the year 9 students in Smith's study were only made if they received sufficient intensive instruction in reciprocal teaching. Smith found that students required at least 12 sessions for the approach to be effective, and that these should be spread over time. In follow-up work with other schools, Smith has found at least 16 sessions to be optimal. The year 7 and 8 students in Fung's study participated in 15–20 one-hour reciprocal teaching sessions (half in Mandarin and half in English) over four to five school weeks.

Teacher knowledge, inquiry, and use of smart tools

Reciprocal teaching is a smart tool[7] that is informed by research and development in the United States that was led originally by Palincsar and Brown.[8] It blends a range of effective approaches, including co-operative learning, metacognitive strategy instruction, differentiated learning, self-regulation, and proactive behaviour management. Reciprocal teaching has generated a large body of research and development to inform its effective implementation across a wide range of contexts and class levels. This includes a variety of adaptations.

While the research indicates that teachers can learn how to use reciprocal teaching well in a relatively short period of time, it can have negative outcomes if poorly implemented, making professional learning and support for teachers important. Marie Kelly reports a range of teacher comments following attending professional development on reciprocal teaching:

> *Year 7 teacher in second year of teaching: I thought I knew this from college, but I really didn't do it well before.*

Te mōhio o te kaiako, te tikanga uiui, te raweke tapu ngaio

Teachers work smarter not harder through the use of evidence for continuous improvement.

Auckland teacher: Your course was definitely worthwhile and I loved it. I picked up lots and lots of little hints and things to use. It certainly pushed me into revising and looking at some things in different ways ….

Westera's thesis provides a detailed account of the professional learning approach she and the school took to implement reciprocal teaching effectively. The following three strategies enabled the participating teachers and teacher aides to develop the knowledge and capability they needed:

- professional leadership from a planning group;
- needs analysis of student data;
- an inquiry approach to professional learning.

The planning group led the collaborative implementation of reciprocal teaching within the school. The group comprised the head of the English department, the staff development co-ordinator, the learning support team (which included a reading teacher, special needs teacher, and teacher aide), and the psychologist-researcher.

The needs analysis revealed that around 20% of the year 9 students scored two to four years below their chronological reading age. The problem was one of comprehension, as decoding was a problem for fewer than 1% of students. As a result, the planning group decided that reading comprehension instruction was to be a school-wide priority.

After examining relevant research, the planning group identified reciprocal teaching as a possible school-wide strategy for addressing this concern. However, there were major barriers to its implementation. At that time, there were provisions to withdraw students with literacy needs but reading comprehension was not regarded as a priority in the core learning areas. As secondary school teachers, the staff viewed themselves as subject teachers, not teachers of reading. So they did not, for example, assess the appropriateness of texts and resources for students with low literacy levels. Implementing reciprocal teaching would require a significant shift in teachers' thinking.

To initiate the necessary change, the planning group presented an analysis of student data to their colleagues at a staff meeting. This inclusive approach to professional leadership gained wider staff ownership of the problem and its solution. In a collaborative effort between departments, reciprocal teaching was incorporated into the regular curriculum and timetable. A manageable plan was developed.

The effectiveness of reciprocal teaching depends largely on the ability of teachers to take specific, knowledgeable, and responsive pedagogical actions. Teachers must lead, model, scaffold, and monitor the reciprocal teaching in such a way that students develop the capability to conduct reciprocal teaching productively and independently in small groups. To achieve this, teachers need to understand both the underlying theory and the practical steps necessary to implement reciprocal teaching well.

Westera provided the participating teachers, teacher aides, and other interested staff with school-based professional development using a research-informed and collaborative approach. Her doctoral thesis provides useful details about the components of the professional development (pp. 85–87), the materials she used (Appendix C), and the professional learning tools she developed (Appendix C, pp. 37–39). The content of the professional development included:

- an introduction to reading comprehension instruction and reciprocal teaching, as well as to understanding and checking text difficulty and interest levels in class and the effects of text difficulty on students' comprehension, learning, and motivation;
- scaffolding, maintenance, and generalisation of reciprocal teaching;
- pre-test and background information on the students in each class and the implications for class programming and grouping;
- attention to implementation issues such as resourcing, timetabling, planning for parallel class activities, the use of an in-class teacher aide, and introducing the role and purpose of reciprocal teaching to selected groups and their class peers;
- strategies for encouraging student use and awareness of the skills in their other learning activities, teaching the skills widely, and promoting generalisation of learning.

Teachers received:

- background reading and key information on reading instruction and metacognitive instruction;
- a video and/or 'fishbowl' demonstration of the teaching strategy (where a small group demonstrates while others observe), followed by roleplay in groups, further rehearsal, and feedback in groups;
- examples of dialogues and cue cards and directions on the skills, introduction, and daily format of reciprocal teaching sessions;
- help to collaboratively plan lessons and resources, co-ordinate the approach across all subject departments, and address issues as they arose;
- information from pre- and post-testing, surveys, and the evaluation and review cycle;
- ongoing support such as more practice sessions (by staff request), and in-class observations, feedback, and regular discussions with colleagues.

Staff in this intervention valued the new knowledge they gained, particularly their increased awareness and skills in recognising students' strengths and difficulties and checking text difficulty levels.

Westera reports that one of the biggest challenges is ensuring that teachers and teacher aides have the necessary knowledge to scaffold students in the approach. Strong professional leadership is required and schools need access to specialist literacy knowledge and expertise. Schools that sustain high-impact reciprocal teaching are careful to select capable teachers and train teacher aides.[9] They are alert to gaps in teachers' knowledge and skills and are responsive to their needs and address student needs for literacy learning across the curriculum. Sustained implementation has required ongoing support, resourcing, and monitoring.

Recent developments in reciprocal teaching: Research and development in the United States

Recent changes in technology have the potential to increase students' access to information and understanding or to overwhelm learners with information at a surface level of understanding. As with any learning tool, if digital tools are to be effective in prompting deep learning, their design should be informed by evidence. Annemarie Palincsar[10] describes how cycles of research and development involving a range of expertise have enabled the design of high-impact digital learning tools. She describes a collaborative venture with the non-profit Center for Applied Special Technologies (CAST) in the United States.

The collaboration informed CAST's approach to embedding reciprocal teaching strategies in digital interactive texts (called the 'Thinking Reader' program). The researchers found that struggling readers have more difficulty than typical readers in deriving information from graphics and in integrating information from graphics and text. These findings led to further collaboration involving educational experts, programmers, artists, graphic artists, and avatar creators to design digital resources that would strengthen readers' access to meaning.

The next stage of the research and development process described by Palincsar focused on developing a support system for teacher professional learning to scale-up the effective use of the reciprocal teaching approach. The new system was called 'Teaching Text, Making Meaning'. The website is innovative in providing internationally accessible learning support to educators. (Details of how you can gain access to this professional learning support are provided in the Resources section of this exemplar.)

Alignment **Tātairite** Curriculum goals, resources, task design, teaching and school practices, and home support are effectively aligned.	In Westera's secondary school intervention, the cross-department planning group identified and addressed a number of alignment issues. These included the need: • for the school to take ownership of the large numbers of students with low reading comprehension and to take a strategic, school-wide approach to addressing the problem; • for teachers and departments to take ownership of the teaching of reading comprehension and address the professional development needs associated with this; • to ensure that timetabling and resource decisions within departments prioritised reading; • to reorganise some reading and curriculum resources to take account of different reading levels and to ensure multiple copies for groups taking part in reciprocal teaching; • to reorient the work of learning support staff so that, instead of withdrawing individuals, they could provide effective support for the large numbers of students in need of help. Reciprocal teaching was readily adapted into the school curriculum. It was made more effective by its aligned use in both English and social studies. As a result of the reciprocal teaching, the staff collaborated to tailor resources to address the diverse needs and interests of students at different year levels, reading levels, and of different cultural identities. Teacher feedback supported its value for staff development and found it feasible for regular teachers if working together with support staff. The professional leadership planning group had a critical role in building alignment in the use of reciprocal teaching in the school. The involvement of learning support and teacher aide staff in understanding, planning, and implementing the strategy was also a significant feature of the implementation. In classes with more than one reciprocal teaching group, the teacher aide ran one group. Teachers said that the learning support staff were critical to the success of the implementation, especially when they were engaged in initial in-depth training of students in small groups.

Outcomes focus **Hua te ako, hua te ākonga** Quality teaching is focused on valued outcomes and facilitates high standards for diverse learners.	**Year 9 (Westera)** The planning group and participating teachers focused on lifting the reading comprehension skills of the lowest achievers in the year 9 cohort to enable them to access the curriculum. They were seeking the outcomes that the reciprocal teaching research showed were possible and which, they believed, were necessary for student success. These included students understanding what they are learning, and having coping and study skills for handling difficult text, strategies for clarifying when they don't understand, skills for handling questions and answers in tests, and the capability and confidence to create and ask productive open, closed, and inferential questions in class. **Year 7 and 8 Taiwanese students (Fung)** Fung focused on the academic language skills in English of students who were recent Taiwanese immigrants. She was concerned that remedial programmes for students with limited English proficiency often focus on decoding skills and vocabulary knowledge but delay instruction in reading comprehension until students have oral fluency in English. She was also concerned by research indicating that without intervention, new immigrant English language learners can take two to three years to become proficient in basic communication skills in English and four to 10 years to approach competence in academic language. She decided to use reciprocal teaching in both languages to rapidly accelerate English reading comprehension: *The pressing reality is that non-English proficient new immigrant secondary school students do not have time to wait for their English language skills to mature to the stage where they can read to learn (p. 2).* **Year 5 and 6 students: Tape-assisted reciprocal teaching (Le Fevre)** Le Fevre's outcomes focus was on reading comprehension in English, self-regulation, and peer collaboration. She identified that poor decoders have limited access to age-appropriate and interesting texts. Better readers tend to be exposed to more challenging texts and texts that hold greater interest. This disparity contributes to a widening of the achievement gap between the two groups. Le Fevre's use of audio-recordings was aimed at countering this by giving students with weak decoding skills access to the meaning of age-appropriate texts.
Caring and inclusive learning communities **Te ako, he tohu manaaki, he piringa tangata** Pedagogical practices enable classes and other learning groups to work as caring, inclusive, and cohesive learning communities.	Reciprocal teaching is one of the more easily implemented forms of co-operative learning. Teachers and their students all take the roles of coach and reflective partner, fostering quality discussions, active engagement, positive relationships, confidence, and enjoyment. They take turns to prompt each other and to lead the learning. The routine of intensive teacher–student and student–student interactions supports students to become more active learners who use discussion to learn. The norms of reciprocal teaching make it acceptable for those taking part to speak up when they do not understand and need help. Students are equipped with strategies to help each other, and they are required to listen to and value each other's contribution. Reciprocal teaching can be adapted for students who are not fluent decoders and for those with special requirements. For example, Palincsar describes[11] 'listening comprehension instruction', an adapted form of reciprocal teaching (reading aloud to students) that teachers used when coaching small groups of at-risk six-year-old students. In that study, teachers commented that the students they thought were at-risk were not that at-risk after all and, on follow-up a year later, there were fewer referrals to special education services. Some of the adaptations that can be made to support students with specific instructional needs include: • more explicit instruction; • mixed-ability groups and cross-age tutoring so skilled peers can foster group dialogue for the less skilled, with the more skilled gaining further tutoring and metacognitive skills themselves; • mixed-ability groups, with students with poor decoding skills using a tape-assisted method so they can enjoy access to age-appropriate and high-interest texts; • for students with low comprehension and/or low decoding scores, using 'read aloud' to teach listening comprehension, alternating listening and reading activities; • for English language learners: alternating in two different languages to allow rapid internalisation of the strategies for comprehension of English text and/or using students' home language where needed to accommodate linguistic differences; • enabling teachers to intensively focus on and scaffold student self-regulation and leadership for one group, and be freed up to work with other students.
Scaffolding **Te ako poutama**	The four key words in the reciprocal teaching metascript – 'clarify', 'question', 'summarise', and 'predict' – are used repeatedly in each reciprocal teaching session. Cue cards and other visual supports can scaffold faster learning of the four cognitive skills. Focused involvement and turn-taking in the small group scaffolds participation. Teachers initiate reciprocal teaching by explicitly teaching and modelling these thinking skills and by providing opportunities for repeated practice accompanied by teacher feedback. They gradually reduce

Pedagogy scaffolds, and provides appropriate feed forward and feedback on, learning.	the scaffolding until each student is ready to assume independent control of the skills. The goal is support learners to gradually incorporate the thinking skills into their personal repertoire for learning across the curriculum. Teachers use the key words in regular classroom learning tasks and conversations to promote the generalised use of these skills. They do so both deliberately and spontaneously.

Westera (pp. 53–56) itemises some of the procedures teachers can use to scaffold student engagement in reciprocal teaching. Her advice includes the following guidelines:

- the students should observe a video or demonstration group doing reciprocal teaching before participating themselves;
- introduce reciprocal teaching procedures separately over three or four reading sessions, allowing time for students to practise previously learned skills before learning a new skill;
- give explicit suggestions to scaffold students' participation, for example: "When you are the 'teacher', you call on someone in the group to answer your question and you may have to say whether you agree or disagree with their answer."

The quality of teacher scaffolding is critical to success. Seymour and Osana[12] (p. 341) describe different ways to effectively scaffold year 7 to 9 students to learn the thinking skills and engage in reciprocal teaching:

1. Prompting: "What question did you think a teacher might ask?"

2. Instruction: "Remember, a summary is a shortened version; it doesn't include all the detail."

3. Modifying activity: "If you are having a hard time thinking of a question, why don't you summarise first?"

4. Praise and feedback: "You asked that question well; it was very clear what information you wanted."

5. Modelling activity that needs improvement: "A question I would have asked would be …."

6. Explicitly telling students that the strategies are ways people help themselves understand what they are reading.

7. Explaining to students why they should practise the strategies when they are reading books of all kinds.

After the teacher has used such techniques and the students have become fluent and flexible in the skills needed to take turns at leading reciprocal teaching within their groups, the teacher moves back further into a facilitating and monitoring role. This frees the teacher to work across different groups.

In Fung's study of year 7 and 8 Taiwanese students, the students were further scaffolded in their learning through the use of their first language on alternating days. They could learn the high-level strategic thinking skills in Mandarin, freed from the burden of working in a new language, English. Their expertise in Mandarin became a resource to facilitate the development of reading comprehension and metacognitive skills in English.

Le Fevre built further scaffolding into reciprocal teaching for poor decoders by having them listen to an audio-recording while following the written text. She also scaffolded metacognitive reflection by students on their use of thinking strategies by having them watch video clips of themselves engaged in reciprocal teaching.

In Smith's study, after students became adept at working with basic recall cue cards, a second set of cards was introduced to cue deep questioning. Students were prompted to formulate more sophisticated questions through cues using words such as 'might', 'could', and 'what if'.

Responsive-ness **Tauaronui** Quality teaching is responsive to student learning processes.	Reciprocal teaching is a form of group thinking. By making learning processes more visible, reciprocal teaching provides opportunities for teachers to assess students and devise appropriate scaffolds. Pre- and post-assessments of student comprehension also provide helpful information (for example, to inform text selection, other adaptations, and scaffolds needed by students).

Reciprocal teaching makes it okay for students not to understand text. The emphasis is not on their lack of understanding; in fact, lack of understanding is seen as a natural condition for learning. Rather, the emphasis is on the strategies that provide the way to understand. Difficulties in understanding are ascribed to challenges in the text rather than student inadequacy. In this way, reciprocal teaching attends to the emotional issues for students who are underachieving. As students develop new comprehension skills and experience the rapid success and increased agency that reciprocal teaching offers, their motivation is triggered.

Through the intensification of peer supports, students have much more access to responsive support than they do in a classroom where they always have to wait for the teacher. However, if reciprocal teaching is implemented in a ritualistic way, unresponsive to learners' needs, it will fail.

Reciprocal teaching focuses on empowering students to gain meaning from text. Where diagnostic assessments reveal very weak decoding skills, teachers should also plan to ensure there is additional support within the wider literacy programme to assist students to make progress on developing these skills. |

Connection **Tūhono** Teaching activates educationally powerful connections to students' lives and identities.	Annemarie Palincsar, who led the original development of reciprocal teaching, explained that this approach is a "way to give voice to children in classrooms."[13] As students use the reciprocal teaching strategies, the process of thinking and talking enable them to make connections to their own experiences. All four reciprocal teaching activities require students to activate their background knowledge. In each stage of the design and implementation of reciprocal teaching, effective teachers scaffold the making of connections. Some of the ways in which teachers can activate educationally powerful connections include: • choosing and sequencing the use of relevant texts (for example, the use of texts that draw upon students' cultural knowledge and expertise while extending their knowledge); • using the students' languages in reciprocal teaching texts; • discussing what students already know about a text, using initial cues; • valuing and modelling connection-making; • linking students' previous contributions to new knowledge arising in the text.
Thoughtful learning strategies **Takina te wānanga** Pedagogy promotes learning orientation, student self-regulation, metacognitive strategies, and thoughtful student discourse.	*Primary school student: It makes you think about what you read instead of just reading it.* Reciprocal teaching is a structured approach to metacognitive strategy instruction. Such strategy instruction is a powerful way to expand the capacity of learners to think and to regulate their own learning. Westera describes the four core cognitive skills in more detail in Appendix C of her thesis (pp. 15–18). While many approaches include a wide range of other skills, in general, the addition of more skills has not been demonstrated to further benefit achievement. Teachers need to teach the core skills explicitly and monitor their use to ensure their thoughtful application in student discourse. While reciprocal teaching is designed to develop thinking skills, the extent to which it succeeds depends upon the quality of implementation. Reciprocal teaching can be weakened in practice when instruction in the skills becomes an end in itself rather than a means to an end (that is, getting, maintaining, and checking meaning). Students may be able to define and explain the skills and even apply them in context, yet use them in a ritualised way rather than as an entry into challenging metacognitive engagement. The excerpts below illustrate the impact of reciprocal teaching on student self-regulation and thoughtfulness in some of the studies in this exemplar.
	Year 5 and 6 students (Kelly) *Sample from the first half of training* *Teacher: We have been reading a paragraph about dolphins. Can anyone help me decide what to do at the end of it?* *Julia: We made up a question, like a teacher asks; then it sort of helps you.* *Teacher: Great, because it helps us to ...?* *Julia: Remember what you have just read.* *Teacher: Brilliant. Who can tell me what words our questions start with? Kevin?* *Kevin: Um ... who, what, where, and, um ....* *Julia: I know – when, why, and how.* *Teachers: Nice one, Julia. You've got your thinking cap on. Ben, what else can we do to help us remember what we have just read? Yesterday we all make up a sentence; it's called a ....* *Julia: Summary, that's when you small it down.* *Teacher: Wonderful, Julia. What else can we do at the end of a paragraph?* No response. *Teacher: Remember, it's like what the weatherman does ....* *Alan: It's kind of like you see in the future thing, um, I forget the name.* *Julia: Yeah, that's right.* *Alan: Um, pr....* *Kevin: Predicting!* *Teacher: Excellent. I guess you've all heard of the sharemarket. They also have a futures market in which people try to predict what will happen to shares; they watch for clues like we are doing so that they can predict what might happen next. So we can ask questions, summarise, predict, and ask for something to be clarified if we are not sure what it means. Now, let's read on and see if we can practise these.*

Sample from the second half of training

Kevin: Okay, my summary now is "The Star of Canada was launched in 1909."

Julia: Was that in New Zealand?

Kevin: No, it was launched in Canada.

Teacher: That's very good thinking, Kevin, but we can also include what the ship was carrying in our summary.

Ben: I know a better summary: "The Star of Canada, which was launched in 1909, was built to carry frozen meat overseas."

Teacher: Nice one, Ben. You made a very good summary.

Kevin: Now for my prediction. Um, I'm not sure ... can anyone else help?

Ben: I can, what happens to the boat?

Alan: Can I be teacher next?

Teacher: Sure thing. Okay, we know the story so far is about a ship carrying frozen meat. So let's read on.

Silent reading of a paragraph.

Alan: My question is, "How much ...", I mean, "How many weeks did the men work hard to get all the cargo out?" Julia?

Teacher: That's a good question, but is it the most important one, Alan?

Steven: I know: "What happened to the ship?" Alan?

Alan: Right, she was caught in a storm near Gisborne.

Julia: And then she broke up.

Steven: Okay, that's right. Well, my summary is ... um .... "The Star of Canada was caught in a storm near Gisborne and broke up."

Teacher: Do we need to clarify anything here?

Becky: I'm not too sure what 'broke up' means.

Ben: Well, it's when the ship goes into ... um ... pieces, isn't it?

Julia: Yeah, it has hit the rocks, keeled over, and bits start to break off; it's a goner.

Teacher: Excellent job, everyone. I like the way you're all helping each other. Are there any predictions?

Becky: I know: The next part will be about what happens to all the people and stuff on board.

Teacher: Well, let's read on and see if Becky is right.

Group continues with silent reading.

Year 7 and 8 Taiwanese students (Fung)

Excerpt from the reciprocal teaching dialogue on Day 3 in L1 Mandarin (translated to English)

Student 1: Well, my first question is: "Who found out this?"

Teacher: Found out what?

Student 1: "Who found out bats don't use their eyes when they fly?"

Student 3: Two biologists – one from Italy, the other one from Switzerland.

Student 1: Yes, that's correct. Now my second question is: "Why ... why...," I mean, "When the ears of the bats were covered with thick cloth, why didn't they fly properly?"

Students 2: Because they rely on hearing sonar echoes to find their way around.

Teacher: Wow, Student 2 knows pretty much about bats, doesn't he?

Students 1: But, but ... it didn't say anything about sonar echoes here.

Student 4: It just says here, they didn't know why the bats didn't fly properly.

Teacher: Well, it's really good to see Student 2 use the knowledge in his head to help us understand this part. But as Student 1 and Student 4 did, we also need to check whether there's any difference between what we know and what the author is trying to say in the text.

Excerpt from the reciprocal teaching dialogue on Day 4 in L2 English

Teacher: So Student 3 predicts that this article is about how doctors help patients. Student 3, would you like to be our first teacher today and lead us to read the first paragraph?

Students 3: Yes [nodding].

Students ask the teacher for translation equivalents as they carry out their silent reading.

Teacher: Student 3, now ask us a question about this paragraph.

Student 3: Umm ... "What colour [pointing at the word 'helicopter] ...?"

Teacher: Helicopter.

Student 3: Helicopter. "What colour is the helicopter?"

Student 1: Red and yellow.

Teacher: That is really an easy question, isn't it? Have you got a harder one? For example, a question that begins with "How" or "Why"?

Student 3: Umm ... umm ... no.

Teacher: Does anyone have another question to ask about this paragraph? Yes, Student 4, you've got one?

Student 4: "How people ... how the people help the patient?"

Teacher: Are you asking, "How do the people on the helicopter help the patient?"

Student 4: Mm ... "How this helicopter help the patient?"

Teacher: That's a very good question. "How does this helicopter help the patient?" Can anyone answer it? [No response]

Teacher: Student 4, can you tell us how this helicopter helps the patient?

Student 4: Umm, it can ... it can bring ... patients to the ... hospital much quicker [reading from the text].

Teacher: Yes. I have a question. "Why do they bring patients to the hospital by helicopter, but not by ordinary ambulance?"

Student 2: Because it is quick.

The reciprocal teaching strategies that the students learned through the group process became resources for them to use in their individual problem-solving as they strove to make sense of what they read.

Before the intervention, Fung used think-alouds to find out about the students' metacognitive strategies. She found that they often ignored what they didn't understand, did not know how to fix their problems with comprehension, and stopped and expressed frustration when such problems arose:

Student 1: I'm not quite sure what it's talking about.

Student 8: Oh! I just don't understand what it says. What on earth is it talking about?

Following the intervention, Fung repeated the think-alouds. She found that the students were more active in their meaning-making and were persistent in their use of the reciprocal teaching strategies to solve comprehension problems:

Student 1: I still don't understand the meaning of this word 'birdstrike'. The 'strike of birds' but this is also one way to hurt birds. It will kill birds. The birds will die, so it must be a way of doing harm to birds when they're sucked into the engine.

Student 8: It says if the engine suddenly lost ... that it would be very dangerous ... when lost means no longer there, so there could be a danger, the plane could crash. But why is it that when the engine is blocked by the bird ... I mean ... why is it that the engine would suddenly disappear?

Reciprocal teaching improving performance on the deeper features of reading comprehension

In their report on the New Zealand High School Communication Skills Programme, Smith, Timperley, and Francis (2011) focus on "how reciprocal teaching affects performance on the deeper features of reading comprehension" (p.2) with secondary school students. Their gain score for increased achievement on deep features was more than double that for students in any of the six schools that formed the comparison group. To develop student thoughtfulness, they used a scaffolded sequence including:

• prompts for 'who', 'what', 'when', 'why', 'which', and 'how' questions;

• (after 10 sessions) a task requiring students to differentiate between explicit and implicit questions in the text;

• cue cards to prompt deeper questioning (such as, 'What might…' ,'Who should…', and 'What if…').

When they reached the prediction task, students were encouraged to debate their predictions, giving reasons to back them up.

It is important to focus on deep thinking. Hattie and Brown[14] report research indicating that classroom activity can inadvertently focus on surface thinking and factual recall, and that many New Zealand secondary school students take a surface approach to their learning, using strategies such as revision and re-reading. Deep learning requires students to go beyond facts and information to question text, explore relationships amongst ideas, impose patterns on the information, and problem solve. They also need to bring their existing knowledge and ideas and to think beyond the obvious, extending their understanding through inference, prediction, or hypothesis.

Appendix B provides an overview of the Structure of Observed Learning Outcomes (SOLO) tool that Smith et al. (2011) used to assist their understanding and assessment of surface and deep features of reading comprehension. The tool has been used to help teachers promote students' deep thinking across different curriculum areas.

Assessment for learning

He aromatawai i roto i te ako

Teachers and students engage constructively in goal-oriented assessment.

Reciprocal teaching provides the strategies and support students need to respond constructively to a breakdown in reading comprehension. When they 'don't get it', students are equipped with strategies, support, and processes they can draw upon to build their understanding. They learn to assess and use their own comprehension failures as resources to support their learning. This use of self-assessment for learning contrasts markedly with the all-too-common scenario where students experience repeated failures as embarrassing, discouraging, and de-motivating. It is empowering for students to make the shift from comprehension failure to strategy use. The strategies provide thinking tools that strengthen students' identities as capable learners.

From the teacher's perspective, assessment for learning helps to achieve several purposes. One is the selecting of appropriate reading materials (in terms of levels, interest, topics, and curriculum relevance) and the setting up of productive groups. Other purposes are to scaffold progress appropriately for each student, monitor student progress, and track the effectiveness of an intervention. Tracking can be done through pre- and post-intervention assessments. For those with relatively weak decoding skills and/or English language comprehension, individualised testing ideally covers both decoding and comprehension (as a discrepancy between these is very relevant to establishing learning needs). Smith et al. (2011) found the asTTle assessments helpful in making the distinction between deep and surface features of comprehension.

Diagnostic assessment should also occur through teachers attending to the think-aloud conversations and interactions occurring in the reciprocal teaching groups. These dialogues provide teachers with a rich source of information on each student's clarifying, questioning, predicting, and summarising skills, as well as other skills. When teachers habitually take a diagnostic approach to assessing the reciprocal teaching dialogue, they can identify recurrent student misunderstandings and use these to inform their future teaching.

Resources

Full text copies of cited articles can be requested by New Zealand schools through the Ministry of Education's Research Behind BES service: www.educationcounts.govt.nz/goto/BES

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Cue cards: www.adrianbruce.com/reading/room4/recip/reciprocalteaching.pdf

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Teaching Text, Making Meaning (username: demo; password: demo): Retrieved from http://edr1.educ.msu.edu/CompStrat/login.asp This website, developed by Annemarie Palincsar with a team of experts at Michigan State University and the University of Michigan below, provides teachers with access to online professional learning to support the implementation of professional learning. Note: Use the password and username above to access the site.

The New Zealand *School Journal* provides an ideal resource for reciprocal teaching as it is an extensive resource that is organised by reading level and provides fiction and non-fiction text relevant to a wide range of New Zealand contexts. The *School Journal* allows teachers to strategically select texts to activate educationally powerful connections for students.
Copies of the *School Journal* are automatically sent to all New Zealand schools with students in years 1 to 8. *School Journal* contents are not individually listed in the Ministry online catalogue. Schools can purchase a yearly subscription to access *Journal Search*, an online web-based search database.
Journal Search covers searches of the Junior Journal, School *Journal*, *Journal of Young People's writing*, *Connected*, and the School Journal Story Library Series. It offers several search options, including curriculum area, genre, title, author, illustrator or photographer, topic, and *School Journal* part, number, and date.

Train your brain to read bookmark: www.miamisci.org/tec/bookmark.html

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Professional learning: BES Exemplar 4 starter questions

What educational outcomes are valued for our *students* and how are our students doing in relation to those outcomes?

How can we activate educationally powerful connections for *all* of our students?

What knowledge and skills do we need as *teachers* to improve student outcomes?

How can we as *leaders* promote our own learning and the learning of our teachers to bridge the gap for our students?

What has been the impact of our changed actions on our students?

Engagement of students in new learning experiences

Design or redesign of learning tasks, activities, and experiences

Engagement of teachers in further learning to deepen professional knowledge and refine skills

Valued student outcomes

How are our students doing in:

- reading comprehension?
- thinking skills, deep learning, and self-regulated learning?
- self-motivated participation and contribution?
- thoughtful group discussions?
- relating to others?

What is our strategy to enable further success for:

- our English-speaking students with weak reading comprehension skills ?
- our students who are English language learners?

Teachers

What are our strategies for teaching reading comprehension and deep learning approaches?

How can we access expertise and information about using reciprocal teaching effectively for our own students?

How can we use the results of our needs analysis to inform our approach?

What relevant reading materials would activate educationally powerful connections for all of our students?

How can we optimise and align our approach to the use of reciprocal teaching to build reading comprehension and learning community across the school?

Are we avoiding common pitfalls in our approach to implementation? (See Appendix B.)

Leaders

What would be optimal timing for our students and our school to implement this intervention?

How can school leadership ensure effective professional learning and development both for teachers and any other staff involved (for example, teacher aides or learning support staff)?

Who should take the wider professional leadership role in our school given our needs analysis and what we want to accomplish? Who should be in our planning group? Who has the knowledge and expertise to take the role of coach?

Where can we access the expertise to implement reciprocal teaching effectively in our school?

What process should we use in developing a manageable plan for action that works for the wider staff?

How can we ensure the resources and support for effective implementation using a knowledge-building and inquiry approach?

How can we ensure coherence in the use of reciprocal teaching within our wider school programmes?

Have we optimised organisational conditions for co-ordination, staffing, time, resources, timetabling, space, coaching, and quality control? Is there anything we should stop doing to help make time to do reciprocal teaching well?

How can we identify classes where the greatest gains are occurring and use those teachers to mentor and support other teachers?

How can we identify and cater for students that did not make the gains others made by the end of the intervention?

How can we respond proactively if the programme is becoming ritualistic?

What strategy do we need to have in place to ensure sustainability?

Appendix A. Structure of Observed Learning Outcomes (SOLO) taxonomy category definitions

The Structure of Observed Learning Outcomes (SOLO)[15] cognitive processing taxonomy was originally developed by Australians John Biggs and Kevin Hollis.[16] The purpose of the tool is to support teaching that gets beyond just surface information. Rather, teaching promotes a balance of surface and deep learning that supports students in constructing their own knowledge and understanding. Smith et al. (2011) used the SOLO taxonomy to develop definitions of the deep and surface aspects of reading comprehension. Hattie and Brown (2004) illustrate its use as a diagnostic tool for teachers in their asTTle assessments in reading, mathematics, pāngarau, and writing.

Category	Definitions	Example for *Goldilocks and the Three Bears*
Unistructural	One aspect of a task is picked up or understood serially, and there is no relationship of facts or ideas.	'Whose house did Goldilocks go into?'
Multistructural	Two or more aspects of a task are picked up or understood serially, but are not interrelated.	'What are three aspects about the way the bears live that tell us the story is not a real life situation?'
Relational	Several aspects are integrated so that the whole has a coherent structure and meaning.	'Goldilocks eats the baby bear's food, breaks his chair, and sleeps in his bed. What does this tell us about the kind of person she is?'
Extended Abstract	That coherent whole is generalised to a higher level of abstraction.	'Why do nursery tales allow wild animals to act in a human fashion?'

Appendix B. BES Exemplar 4 implementation alerts

Not recommended	What the research shows about more effective implementation
Teaching the whole class (or staff) reciprocal teaching and then dividing into groups	Start with the small group and make it an enjoyable and memorable first experience. 'Instructional chaining' can be used live or by DVD to introduce staff or students to reciprocal teaching. First a group of people experienced with reciprocal teaching role plays its use, using the fishbowl approach (where a small group demonstrate a strategy while others observe). Groups then practise the strategy. The groups are mixed on the basis of the length of their previous experience with reciprocal teaching.
Running a few sessions	Run at least 12–15 sessions, preferably more, over a few weeks or a term to develop and consolidate skills and build self-managing group cultures. Doing it for less time at secondary level will likely not provide sufficient opportunity for students to benefit. Use an inquiry approach to check what works for valued student outcomes in your context. If possible, keep the momentum by running at least three sessions a week for at least five weeks. More sessions, booster sessions, and extended use of reciprocal teaching is associated with more durable results. With ongoing use, ongoing annual gains have been reported.
Providing the same experience to all students	Match text reading difficulty levels, interest, and curriculum appropriateness with the students' needs. Be especially careful to select material for unmotivated students that is likely to capture their interest. Group students and adapt the procedures for instructional reasons. If you need help, get specialist advice and guidance.
Running the programme without quality control	Use an assessment, needs analysis, and review cycle, preferably involving collaboration with other teachers. Use high-quality explicit teaching and monitor each other by observation and feedback where needed. (See Davis,[17] pp. 247–249, for a Reflection and Observation Guide and Westera, Appendix C, pp. 37–39.)
Running reciprocal teaching groups without much teacher input	Use explicit teaching to coach and scaffold skills in a responsive way at the beginning and throughout the sessions. Maintain a strong teacher role longer to sustain more extensive and ongoing coaching of thoughtful strategy use. Note that complex skills such as reading comprehension and monitoring are often difficult to teach explicitly and require a shift in the teacher's role to coach. Also, students need more frequent, deeper, and more flexible cognitive support than when acquiring simple skills.
Doing it for the sake of it	Make the goals transparent to students. Be explicit about the reasons why they are using reciprocal teaching. (See Westera, Appendix C, pp. 30–31.) Develop student awareness and ownership of the goals.
Maintaining rigid routine	Avoid rigidity and ritualised use of reciprocal teaching that does not lead to thoughtful student discourse. Ensure a responsive approach in which you are attending to student need. Planning for the implementation of reciprocal teaching in several phases can help to avoid rigidity: • Phase 1: Introduce the teaching strategy in a planned way (see Westera, Appendix C, pp. 21–23) and ensure it's enjoyable (choose initial high-interest reading materials) and seen as a valued way to learn. • Phase 2: Regularly use the routines until the students are fluent in the skills and in self-managing the basic routines and are making progress. • Phase 3: Promote generalisation of the skills and groupwork in different teaching and wider contexts; use booster sessions; run another chunk of sessions. • Phase 4: Scaffold students and group process into a wider genre of texts, more complex questioning skills, more depth and flexibility in the group dialogue, and so on. Students will need scaffolded support to develop the confidence and skills to engage in collaborative reasoning. BES Exemplar 1: Developing Communities of Mathematical Inquiry illustrates ways in which students were supported to take different perspectives and engage in polite argumentation and reasoning.
Going it alone	Many teachers will need advice and guidance from those with expertise and experience in the effective use of reciprocal teaching, and/or literacy assessment. Teachers are more likely to succeed when they have the opportunity to work in a school-based professional learning community. Stronger gains are indicated when reciprocal teaching is used across several learning areas to promote more flexible skill development and generalised use. Through successive use in different contexts, schools can build a collaborative peer-learning culture.

1   Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* London: Routledge.

2   There have been studies of the use of reciprocal teaching to support students' problem solving when using mathematics word problems. The achievement and social outcome gains associated with the approach taken in BES Exemplar 1: Developing Communities of Mathematical Inquiry indicate that the subject-specific Mathematics Communication and Participation Framework may be a stronger tool to support a range of valued outcomes in mathematics.

3   Cohen, E. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research, 64* (1), pp. 1–35.

4   Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* London: Routledge.

5   Hattie, J., & Brown, G. (2004). *Cognitive processes in asTTle: The SOLO taxonomy. Assessment Tools for Teaching and Learning* (Technical Report No. 43). Prepared for the New Zealand Ministry of Education by Auckland Uniservices. Retrieved from http://www.tki.org.nz/r/asttle/pdf/technical-reports/techreport43.pdf

6   This section draws on *The New Zealand curriculum* and the parallel document, *Te marautanga o Aotearoa.*
Ministry of Education (2007). *The New Zealand curriculum.* Wellington: Learning Media.
Ministry of Education (2008). *Te marautanga o Aotearoa.* Wellington: Learning Media.

7   In education, a smart tool is one that supports professional learning about how to advance student learning. Selecting, developing, and using smart tools was found to be a leadership practice that advanced valued student outcomes in the *School leadership/He kura rangatira BES.* Leaders select and design smart tools by ensuring they are based on valid theories and that they are well designed to serve their purpose. Tools are only designated 'smart' if the evidence indicates that they actually do advance valued outcomes for students.

8   Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension fostering and monitoring activities. *Cognition and Instruction, 1*, pp. 117–75.

9   Brown, J., & Harris, A. (2009). *Increased expenditure on associate staff in schools and changes in student attainment.* London: Institute of Education.

     Audit Commission (2011). *Classroom deployment: Better value for money in schools.* London: Audit Commission. Available from www.improvementnetwork.gov.uk/imp/aio/2381308

10 Palincsar, A. S., Spiro, R. J., Kucan, L., Magnuson, S. J., Colins, B., Hapgood, S., Ramchandran, A., DeFrance, N. and Gelpi-Lomangion, A. (2007). Designing a hypermedia environment to support comprehension instruction. In D. S. McNamara (Ed.), *Reading comprehension strategies: Theories, interventions, and technologies* (pp. 441–462). Mahwah, NJ: Lawrence Erlbaum.
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Palincsar, A. S. (2007). The role of research, theory, and representation in the transformation of instructional research. *National Reading Conference Yearbook*, vol. 67, pp. 41–52. Available from http://yearbook.nrconline.org/56th_Yearbook/sullivanpalincsar.pdf

11 Palincsar, A. S. (1992). *Beyond reciprocal teaching: A retrospective and prospective view.* Cattell Talk presented at the annual meeting of the American Educational Research Association. San Francisco, CA.

12 Seymour, J. R., & Osana, H. P. (2003). Reciprocal Teaching procedures and principles: Two teachers' developing understanding. *Teaching and Teacher Education. 19* (3), pp. 325–344.

13 Palincsar, A.S. (2007). Reciprocal teaching 1982 to 2006: The role of research, theory, and representation in the transformation of instructional research. In D.W. Rowe, R.T. Jiminez, D.L. Compton, Y. Kim, K.M. Leander & V.J. Risko (Eds.). *56th Yearbook of the National Reading Conference.* Oak Creek, WI: National Reading Conference, p. 44.

14 Hattie, J., & Brown, G. (2004). *Cognitive processes in asTTle: The SOLO taxonomy. Assessment Tools for Teaching and Learning.* Technical Report No. 43. Prepared for the New Zealand Ministry of Education, Auckland Uniservices.

15 Hattie, J., & Brown, G. (2004). *Cognitive processes in asTTle: The SOLO taxonomy. Assessment Tools for Teaching and Learning.* Technical Report No. 43. Prepared for the New Zealand Ministry of Education, Auckland Uniservices. Retrieved from http://www.tki.org.nz/r/asttle/pdf/technical-reports/techreport43.pdf

16 Biggs, J.B., & Collis, K.F. (1989). Toward a model of school-based curriculum development and assessment using the SOLO taxonomy. *Australian Journal of Education*, 33, pp. 151–163.

17 Davis, A. (2007). *Teaching reading comprehension.* Wellington: Learning Media.