

# Effective writing instruction in Years 3-8



School resources

How do I know what I think till I see what I say?

E. M. Forster, 1927

Writing has long been acknowledged as a tool for thinking, which supports the development of creativity, logic, and reasoning<sup>1</sup>. It is also vital to education and employment. At school, writing enhances learning across the curriculum, improving recall and comprehension, word reading, and reading fluency. In the world of work, it is estimated that writing skills are required in over 70% of salaried jobs<sup>2</sup>.

Given the importance of writing in many aspects of life, [low rates of student achievement](#) are cause for concern. These are evident across a number of countries, including in the US, where results from the National Assessment of Educational Progress (2007) suggest that only 33% of 8th Grade (NZ Year 9) students, and only 24% of 12th Grade (NZ Year 13) students were performing at or above a 'proficient' level<sup>3</sup>. In New Zealand and Australia, lower rates of achievement amongst students in the higher elementary (primary) grades are also notable. In New Zealand, data from the National Monitoring Study of Student Achievement (2018) indicate that 63% of students in Year 4 were achieving at the expected curriculum level, compared with just 35% of students in Year 8<sup>4</sup>. In Australia, the National Assessment Program writing data from 2018 show a decline in the mean scores of Years 7 and 9 students since the 2011 round<sup>5</sup>.

Clearly, there is an urgent need to re-evaluate approaches for teaching writing, and to identify methods that work. It is important to understand what the 'status quo' in writing instruction has been and which particular methods have led to these poor results.

As is widely recognised in international literature, the Whole Language movement has been influential on the curricula of many countries since the 1970s<sup>6</sup>. For the teaching of writing, Whole Language advocates have recommended Process Writing, a set of methods developed on the premise that learning to write occurs somewhat 'naturally', like speech. Teaching handbooks emphasise the importance of student motivation to write. They recommend student choice of topic and the use of students' personal experiences as inspiration for writing. While research indicates the importance of motivation for writing and other curriculum areas, it is not sufficient in itself. The handbooks de-emphasise the importance of the explicit teaching of pre-determined learning objectives, as well as the teaching of technical skills such as handwriting and spelling. Instead, teachers are advised to support a free-flow drafting process, with conventions of correctness considered only in the final stages<sup>7</sup>.

Significantly, these recommendations were founded in anecdotal rather than empirical research<sup>8</sup>. Despite this, the theories have informed advice promulgated by the New Zealand Ministry of Education. For example, in *Effective Literacy Practice in Years 1-4*, writing is defined as, 'a creative act, not a set of quantifiable skills to be taught in sequence'<sup>9</sup>. While many teachers now reject Process Writing in its original form, recent research into teachers' practices indicates the ongoing influence of the Whole Language and Process Writing ideology<sup>10</sup>.

The following review is informed by this body of research. Information is drawn from studies with a range of designs, including:

- descriptive, in which observational data is collected under non-experimental conditions - for example, collecting data on the composing process by asking writers to 'think aloud' as they write
- correlational, in which the relationship of two variables to each other is examined - for example, the relationship between handwriting fluency and written expression
- experimental, in which the progress made by students in one condition (for example, a new method for learning spelling words) is compared with the progress made by students in a different condition, or in a 'business as usual' condition
- meta-analyses, in which data from a number of different scientific studies are analysed together to determine overall trends.

## The developing writer's writing process

Empirical research into the writing process highlights its complexity. Writing involves the coordination of many elements, including basic skills such as letter formation, spelling and punctuation use, knowledge of one's purpose for writing, and of conventions of genre, sentence structures and text organisation. It involves the coordination of skills including planning, re-reading, evaluating and revising. Significantly, these skills do not follow one another in a linear fashion but interact recursively throughout composition<sup>11</sup>. For example, skilled writers may evaluate and revise their very first sentence and continue to modify their planning even as they work on final paragraphs. To co-ordinate all of these demands requires self-regulation. This means being conscious of one's purpose and the writing strategies available, and continually re-reading and revising the developing text in line with one's purpose<sup>12</sup>.

The writing process is made all the more challenging as it must be managed within the constraints of working memory, a system which manages all new information, or 'the content of consciousness'<sup>13</sup>. Working memory is extremely limited in its capacity, particularly for children. This means that if the technical basics (such as letter formation) have not been practised to automaticity, these will likely occupy all a student's working memory and prevent them from attending to other aspects of writing<sup>14</sup>.

Research has demonstrated what we need to teach in order to support our students to successfully manage this complex process, and to achieve their potential as writers. A seminal model, The Simple View of Writing, summarises empirical findings of research into writing development and identifies three sets of sub-skills that are essential to writing development. These are labelled translation, transcription, and self-regulation<sup>15</sup>. In the following section, these three sub-skills are further defined, and broad teaching strategies are described.

## Teaching the skill sets

### Translation

Translation is the expression of thoughts in language, requiring **vocabulary knowledge and sentence-generation skills**<sup>16</sup>. Oral language is a key starting point, even for older children, as the significance of oral language to writing ability actually increases with grade or year level<sup>17</sup>. At the beginning of a teaching sequence, oral practice will allow students to develop fluency with vocabulary knowledge and sentence-generation skills, without the additional demands of writing. They can then apply these skills more easily to writing<sup>18</sup>.

**Vocabulary** can be taught directly by selecting specific words for explicit teaching and practice, or through the analysis of word parts to help uncover meanings. It has been estimated that students can be taught approximately 400 words per school year using direct methods. This is not enough to cover all of the words that students need to learn, so other, indirect methods are also required<sup>19</sup>. These include:

- re-reading and retelling texts
- the modeling by teachers of high-quality oral language
- promoting an interest in words and their meanings ('word consciousness')
- teaching independent word-learning strategies, such as using the context of the sentence, or thinking of words with parts that are the same, to help uncover word meanings<sup>20</sup>.

Regarding **sentence construction**, numerous empirical studies support the use of sentence-combining as a way to improve the quality of children's writing, as well as the amount and quality of revision they do<sup>21</sup>. Sentence-combining involves direct teaching and practice with the manipulation of two or more simple sentences to produce more sophisticated structures. Extra words may also be prompted (or cued). For example, students are given two simple 'kernel' sentences, with cued words displayed in brackets:

- (i) We were swimming.
- (ii) The shark came into the bay. (and/while)

Students can form the compound sentence 'We were swimming and a shark came into the bay', or the complex sentence 'While we were swimming, a shark came into the bay'. They can then be asked to evaluate the different sentence structures. Kernel sentences may also be taken from well-known stories, non-fiction texts (which may reinforce learning in other areas), or the students' own work<sup>22</sup>.

For both vocabulary and sentence-structures, practice with authentic writing tasks is important. The application of vocabulary knowledge can be supported by pre-writing activities, such as brainstorming prior knowledge of the topic<sup>23</sup>. Sentence-construction skills can be used while the student is composing a piece of writing, but this will require that teachers give close support to individual students during this time<sup>24</sup>.

## Transcription

Transcription skills, **spelling and handwriting**, must be taught and practised until they become automatic, or they will occupy all of a student's working memory and prevent them from thinking about other, more creative aspects of the process<sup>25</sup>. These skills are particularly significant for younger students, though they impact on the writing of students in the middle and upper elementary or primary grades too. Spelling and handwriting have been found to account for 41% of the variance in writing fluency, and 42% of the variance in writing quality in students in primary school<sup>26</sup>. Handwriting has the most sizeable influence on the writing of younger students, while spelling has a more consistent influence across all levels<sup>27</sup>.

When thinking about the significance of these skills for older students, the so-called 'Matthew effect' is a key consideration. Difficulty with transcription may lead to frustration and embarrassment, which leads in turn to a reluctance to write, meaning that struggling writers fall further behind<sup>28</sup>. For these students, teachers should prioritise the teaching of transcription, using evidence-based approaches as detailed below.

**Effective instruction in spelling** requires the teaching of phonemic awareness (hearing sounds and syllables in words), letter patterns, word structures, and word origins. As there is a lot to cover, content must be spread over the primary years. For middle and upper primary students, instruction can focus on:

- long-vowel, and other vowel spellings (for example 'rain', 'day', 'came'; 'her', 'shirt', 'curl')
- inflectional endings (ing, ed) and associated spelling rules (such as dropping the final e before adding ing)
- spelling multi-syllabic words
- words of Latin and Greek origin and their parts (including prefix, root and suffix).

Certain principles should guide instruction:

- Teaching should be explicit and systematic, with many opportunities for practice. This means that spelling should be taught daily, and students should be encouraged to apply their spelling knowledge while writing throughout the school day across all curriculum areas.
- Spelling instruction should focus first on sounds in words, and then on how to spell the sounds. This approach follows the principle on which our alphabet is based (letters represent speech sounds) and enables students to use sounds in words as a clue to their spellings (instead of relying entirely on visual memory). For example, when learning to spell the word 'light', students should be supported to segment the word into phonemes (l-igh-t), and then be shown the spellings for these phonemes, including the long 'i' spelt using 'igh'.
- Teachers should acknowledge that the same sounds can be spelt in different ways (consider the long 'i' once again, represented differently in 'ice', 'my', 'light', and 'pie'). Acknowledging this diversity is important for students' confidence in themselves and in the programme (a student who has learnt just one spelling for the short 'u' will likely feel confused and disheartened when they encounter words such as 'away', 'come' or 'mother').
- Assessment should guide programmes and should go beyond counting errors to the analysis of them, so that teachers learn more about the specific spelling knowledge and strategies their students need to learn. For example, a student who writes 'fog' for 'frog' may need practice with segmenting words into phonemes; and a student who writes 'payn' for 'pain' needs to learn about long 'a' spellings and to use 'ay' only at the end of a syllable (as in playing)<sup>29</sup>.

Several teaching methods have been shown to be **effective for teaching handwriting**. First, visual and verbal modeling by the teacher is important, followed by closely monitored practice by students of writing the letters 'from scratch' (rather than tracing)<sup>30</sup>. Second, letters should be taught in formation groups (for example, the letters t, i, l, k are all made with vertical downwards strokes)<sup>31</sup>. Third, because handwriting is a physical skill, the fastest progress will be made with short amounts of daily practice, using a variety of surfaces (blackboards, whiteboards, pencil and paper)<sup>32</sup>. Finally, older children may wish to practice their handwriting using an iPad and stylus, a method which has been demonstrated to have benefits for motivation<sup>33</sup>.

### Self-regulation of the writing process

Self-regulation, or 'the ability to monitor and direct one's own composing process'<sup>34</sup>, must, by definition, be taught and practised in the context of extended and purposeful writing tasks. The following recommendations reflect key findings about developing self-regulation during composition lessons from the studies on the teaching of writing.

**Recommendation one:** Students need to know that writing can be used for a variety of purposes and audiences, and that we **write with higher order goals in mind**. Teachers should plan writing tasks that will encourage students to mindfully consider such goals<sup>35</sup>. For example, the task 'to write the biography of a local war veteran, to be published in the school newsletter' may encourage students to consider higher order goals such as clarity, interest, and respectful treatment of the material more so than writing about what they did in the holidays.

**Recommendation two:** Using key progressions in the development of writing drawn from the empirical literature, learning should be scaffolded to allow for a **gradual release of responsibility from the teacher to the student**. Discussion and modeling should be used to introduce new skills and strategies, and this should be followed by supported and independent practice. Ongoing formative assessment will allow teachers to reflect on students' progress, and to provide extra support when it is needed<sup>36</sup>.

**Recommendation three:** We need to teach **knowledge of different text structures** (for example, narrative, expository, or persuasive) and their uses. This can be done by explicitly teaching conventions of text organisation and style. Students could analyse model examples for different text types (for example, Gary Paulsen's *Hatchet* could provide a model for the students' own survival stories). [Graphic organisers](#) could be used to scaffold planning for a range of structures<sup>37</sup>. Another idea is to have students rewrite texts using a different structure than the original (for example, after writing reports on the importance of learning to swim, students could write persuasively to the principal to ask that upgrades be made to the school pool)<sup>38</sup>.

**Recommendation four:** We need to **teach strategies for all of the writing processes, including planning, writing and revising, and evaluating**. For planning, graphic organisers and mnemonics can provide support. For example, students could learn the mnemonic POW: **P**ick ideas, **O**rganise my notes, **W**rite and say more<sup>39</sup>. For writing and revising, teach a process of re-reading and checking at the sentence level. A clear set of prompts is useful here: for example, 'think of an idea, write it down, read it and check that it sounds right and makes sense, check that it has a capital letter at the beginning and a full stop at the end'. Then, teach students to make tidy corrections or revisions as they go. For evaluating, provide opportunities for self and peer assessment, such as asking students to reflect on what worked well in their own story, or having them complete a 'buddy check' for elements of genre when reading a classmate's persuasive essay<sup>40</sup>. **Modelling** is an effective way to teach the use of these strategies. Modelling can also be used to demonstrate the ways the sub-processes interact. Teachers can 'think-aloud' to show students how they think of ideas and plan, modify these ideas as they go, and evaluate the success of their efforts at the end of writing<sup>41</sup>.

**Recommendation five:** [Feedback](#) can increase students' self-awareness, which is vital to self-regulation. It also has positive effects on achievement<sup>42</sup>. Feedback information is made all the more powerful when combined with a visual display of progress. For example, teachers could track students' progress towards a goal such as 'to use direct speech to show how a character is feeling' on a one-page graph, with the date and a tick used to indicate progress towards the goal and the date and a sticker used to indicate full achievement<sup>43</sup>. Self-regulated strategy development, which uses student self-graphing of progress as a central component, is a proven method for teaching composition to both typically-achieving students and those with special educational needs<sup>44</sup>.

## The place of knowledge

While the Simple View of Writing highlights the importance of translation, transcription, and self-regulation skills, knowledge is also key, and is inherent in all of these. Translation requires knowledge of vocabulary and sentence structure, while transcription requires knowledge of spelling, and self-

regulation requires knowledge of the conventions of text structures, as well strategies for managing the writing processes<sup>45</sup>. In addition, when writing expository or persuasive texts in particular, students require in-depth knowledge of the subject at hand. While it seems obvious, it is important to acknowledge that students cannot write about something they do not know about, and it is the degree to which they understand a topic that enables them to write well about it. It is also interesting to consider the opportunities for skill development that writing of this kind may provide. Students must be able to research (and evaluate the integrity of their sources), integrate new information, and present this in a coherent and logical order for their intended readers<sup>46</sup>. A consideration of the depth and breadth of knowledge required for writing highlights, once again, the importance of students practising certain skills to automaticity, to free up working memory so that it can be used for more complex cognitive demands.

### Assistive Technology for the remediation of writing difficulties

Empirical studies have investigated the use of assistive technologies for remediating writing difficulties, and while some of these have produced promising results, traditional pencil and paper methods remain the best option for neurotypical students, even when they are demonstrating difficulty. For other students (such as those with diagnosed dysgraphia) assistive tools may be a sensible option, when introduced intentionally. Some of the key themes from existing studies that teachers should keep front of mind are that Assistive Technology should not replace quality instruction; tools should be selected to address particular needs (for example, word processing could be helpful for students with persistent handwriting difficulties); and thought should be given as to whether their function is compensatory or remedial (for the student with handwriting difficulties, word processing will compensate for, but not remediate, their handwriting difficulties)<sup>47</sup>. Some commonly used technologies, their purposes, benefits, and key considerations are reviewed briefly below.

**Technologies to support handwriting practice:** A study investigating the use of a computer programme to support handwriting practice in students with special educational needs in Grades 4-9 (NZ Years 5-10) observed improvements for students at post-test, leading the research team to recommend assistive technology for Tier 3 instruction (for children with specific learning needs who require support additional to whole class or small group lessons)<sup>48</sup>. However, in another study which compared the efficacy of pencil and paper with iPad mediated instruction, children taught using a pencil and paper made greater gains in letter formation, letter orientation, and letter recognition, while children using iPads wrote more. This latter finding may have been due (as the authors suggest) to children's motivation to write with a stylus. Teachers may therefore wish to provide opportunities for handwriting practice using a range of writing tools<sup>49</sup>.

**Word processing to support transcription and revision:** Word processing may have particular benefits for writers who struggle with handwriting and spelling as it allows them to produce readable text which can be easily edited and revised<sup>50</sup>. These benefits are, however, reliant on computer skills such as typing, and so these skills must also be taught. Greater speed while transcribing will not necessarily improve writing skill more generally, so explicit instruction in all other aspects of the process remains essential<sup>51</sup>.

**Word prediction and spell-checking tools to support transcription and revision:** Word prediction software can be useful for students with dyslexia and dysgraphia, as they compensate for spelling difficulties and so support these students to produce texts with fewer mechanical errors. Word lists provide possible spellings for students who have limited knowledge and reduce the number of keystrokes needed to write them. Spell checkers have been shown to significantly increase the number of spelling corrections made by students with special educational needs (from around 0-27% to 80-90%), especially when strategies for proof-reading are also explicitly taught. Certain caveats exist, however. First, the requirement to scan and select words from a list can add to a student's cognitive load and may decrease the speed at

which they write. Second, these tools will not be appropriate for students with the most severe spelling difficulties whose writing often includes many unrecognisable words. Third, spell checkers should not displace explicit spelling instruction, which has been shown to facilitate spelling and other writing and reading skills<sup>52</sup>.

**Speech-to-text software to support transcription:** Speech-to-text software is another tool which may be useful for students with specific handwriting and spelling difficulties. This tool would be used in a compensatory function as it removes the need to spell or to write by hand. Speech-to-text software has been shown to increase the length of students' compositions and reduce the number of errors they make. Interestingly, using speech-to-text tools results in slower transcription speeds (compared to handwriting or word processing), although this speed increases with practice. Teachers choosing to use speech-to-text software should be aware that instruction and practice in speech recognition procedures are essential. Students must learn to speak clearly, dictate punctuation and formatting, and learn specific commands for editing<sup>53</sup>.

**Software to facilitate planning and revising:** Procedural facilitation software could be used to support students with the writing processes. These tools use cues, questions, and think-sheets to support planning and revising strategies, and have been shown to improve students' revision skills in particular. A 2018 evaluation of the overall effectiveness of six commercially available programmes demonstrated small to moderate effects overall on student achievement<sup>54</sup>.

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## Endnotes

- 1 Applebee, A. (1984). Writing and reasoning. *Review of Educational Research*, 54(4), 577-596; McCutcheon, D. (1988). 'Functional automaticity' in children's writing: a problem of metacognitive control. *Written Communication*, 5(3), 306-324.
- 2 Graham, S. & Hebert, M. (2010). *Writing to Read*. Carnegie Corporation: New York.
- 3 Graham & Hebert, 2010.
- 4 Ministry of Education (2021). *How our education system is performing for literacy: Progress and achievement of New Zealand learners in English medium settings*. New Zealand Government report.
- 5 McGaw, B., Loudon, W. & Wyatt-Smith, C. (2020). *NAPLAN Review: Final Report*. State of New South Wales (Department of Education), State of Victoria (Department of Education and Training), and Australian Capital Territory.
- 6 Goodman, K. (1993). I didn't found whole language: Whole language found me! *The Education Digest*, 59(2), 64-67; Graham, S. & Harris, K. (1994). Implications of constructivism for teaching writing to students with special needs. *The Journal of Special Education*, 28(3), 414-424.
- 7 For example, Graves, D. (2003). *Writing: Teachers and Children at Work*. Portsmouth: Heinemann.
- 8 Goodman, K. (1992). I didn't found whole language. *The Reading Teacher*, 46(3), 188-199.
- 9 Ministry of Education. (2003). *Effective Literacy in Years 1-4*. Wellington: Learning Media Limited, p.136.

- 10 Graham, S., Harris, K., MacArthur, C., & Fink, B. (2002). Primary grade teachers' theoretical orientation concerning writing instruction: Construct validation and a nationwide survey. *Contemporary Educational Psychology*, 27, 147-166;
- Walls, H. & Johnston, M. (2022). Teachers' beliefs for the teaching of writing: Influences on student progress. *Assessing Writing* (in press).
- 11 Flower, L. & Hayes, J. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365-387.
- 12 Bereiter, C. & Scardamalia, M. (1987). *The Psychology of Written Composition*. New Jersey: Laurence Erlbaum Associates.
- 13 Lipson, B. (2020). *New Zealand's Education Delusion: How bad ideas ruined a once world-leading school system*. Wellington: The New Zealand Initiative, p. 63.
- 14 Brann, B. (2001). *Working with Students with Learning Difficulties*. Queensland: Merganza Training and Development; Cowan, N. (2010). The magical mystery four: How is working memory capacity limited, and why? *Current Directions in Psychological Science*, 19(1), 51-57.
- 15 Berninger, V., Graham, S., Vaughan, K., Abbott, R., Begay, K., Byrd Coleman, K., Curtin, G., & Minich-Hawkins, J. (2002). Teaching spelling and composition alone and together: Implications for the simple view of writing. *Journal of Educational Psychology*, 94(2), 291-304.
- 16 Kent, S., Wanzek, J., Petscher, Y., Al Otaiba, S., & Young-Suk, K. (2014). Writing fluency and quality in kindergarten and first grade: the role of attention, reading, transcription, and oral language. *Reading and Writing*, 27, 1163-1188.
- 17 Berninger, V., Abbott, R., Jones, J., Wolf, B., Gould, L., Anderson-Youngstrom, M. (2006). Early development of language by hand: composing, reading, listening, and speaking connections; three letter-writing modes; and fast mapping in spelling. *Developmental Neuropsychology*, 29(1), 61-92.
- 18 Arfe, B., Festa, F., Ronconi, L., & Spicciarelli, G. (2021). Oral sentence generation to improve fifth and 10th graders' writing. *Reading and Writing*, 34, 1851-1883.
- 19 Beimiller, A. (2012). Teaching vocabulary in the primary grades: Vocabulary instruction needed. In J. Baumann & E. Kame'enui (Eds.) *Reading vocabulary: Research to practice*. New York: Guilford Press.
- 20 Sedita, J. (2005). Effective vocabulary instruction. *Insights on Learning Disabilities*, 2(1), 33-45.
- 21 Saddler, B. (2005). Sentence combining: A sentence-level writing intervention. *International Reading Association*, 468-471; Saddler, B. & Graham, S. (2005). The effects of peer-assisted sentence-combining instruction on the writing performance of more and less skilled young writers. *Journal of Educational Psychology*, 97(1), 43-54; Wyse, D. (2001). Grammar for writing? A critical review of empirical evidence. *British Journal of Educational Studies*, 49(4), 411-427.
- 22 Saddler, B. (2005).
- 23 Ray, A., & Graham, S. (2019). Effective practices for teaching students who have difficulty with writing. *Learning Difficulties Australia*, 51(1), 13-16.
- 24 Jones, S., Myhill, D., & Bailey, T. (2013). Grammar for writing? An investigation of the effects of contextualised grammar teaching on students' writing. *Reading and Writing*, 26, 1241-1263.

- 25 Berninger, V. (1999). Coordinating transcription and text generation in working memory during composing: Automatic and constructive processes. *Learning Disability Quarterly*, 22(2), 99-112; McCutcheon, D. (1996). A capacity theory of writing: Working memory in composition. *Educational Psychology Review*, 8(3), 299-325.
- 26 Graham, S. (1997). Role of mechanics in the composing of elementary school students: A new methodological approach. *Journal of Educational Psychology*, 89(1), 170-182.
- 27 Daffern, T., Mackenzie, N., & Hemmings, B. (2017). Predictors of writing success: How important are spelling, grammar and punctuation? *Australian Journal of Education*, 61(1), 75-87.
- 28 Jones, D. & Christensen, C. (1999). Relationship between automaticity in handwriting and students' ability to generate written text. *Journal of Educational Psychology*, 91(1), 44-49.
- 29 Joshi, R., Treiman, R., Carreker, S., & Moats, L. (2008). How words cast their spell: Spelling is an integral part of learning the language, not a matter of memorization. *American Educator*, 6-43.
- 30 Graham, S., & Weintraub, N. (1996). A review of handwriting research: Progress and prospects from 1980 to 1994. *Educational Psychology Review*, 8(1), 7-87; James, K., & Englehardt, L. (2012). The effects of handwriting experience on functional brain development in pre-literate children. *Trends in Neuroscience and Education*, 1, 32-42.
- 31 Berninger, V., Vaughan, K., Abbott, R., Abbott, S., Woodruff-Rogan, L., Brooks, A., Reed, E., & Graham, S. (1997). Treatment of handwriting problems in beginning writers: Transfer from handwriting to composition. *Journal of Educational Psychology*, 89(4), 652-666.
- 32 Lockhart, J., & Law, M. (1994). The effectiveness of a multisensory writing programme for improving cursive writing ability in children with sensorimotor difficulties. *Canadian Journal of Occupational Therapy*, 61(4), 206-214.
- 33 Wells, K., Sulak, T., Saxon, T., Howell, L. (2016). Traditional versus iPad mediated instruction in early learners. *Journal of Occupational therapy, Schools, & Early Intervention*, 9(2), 185-198.
- 34 Flower, L., & Hayes, J. (1980). The dynamics of composing: Making plans and juggling constraints. In L. Gregg & E Steinberg (Eds.) *Cognitive Processes in Writing*. Hillsdale, NJ: Lawrence Erlbaum Associates, p. 39.
- 35 McCutcheon, 1988.
- 36 Graham, S., Bollinger, A., Booth Olson, C., D'Aoust, C., MacArthur, C., McCutcheon, D., & Olinghouse, N. (2012). *Teaching Elementary School Students to be Effective Writers: A Practice Guide*. Washington DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
- 37 Osen-Foss, J. (n.d.). Download: Graphic Organizers to Help kids with Writing. Understood. Accessed 15/3/22: <https://www.understood.org/articles/en/download-graphic-organizers-to-help-grade-schoolers-with-writing>; Paulsen, G. (2008). New York: Simon & Schuster.
- 38 Reynolds, G., & Perin, D. (2009). A comparison of text structure and self-regulated writing strategies for composing from sources by middle school students. *Reading Psychology*, 30, 265-300.
- 39 Ray and Graham, 2019.

- 40 Graham et al., 2012; Walls H., & Johnston, M. (2021). The Fast Feedback Method: a quasi-experimental study of the use of formative assessment for primary students' writing. *Australian Journal of Learning Difficulties*, 26(1), 21-46.
- 41 Ray & Graham, 2012.
- 42 Graham, S., Hebert, M., & Harris, K. (2015). Formative assessment and writing: A meta-analysis. *The Elementary School Journal*, 115(4), 523-547.
- 43 Fuchs, L. & Fuchs, D. (1986). Effects of systematic formative evaluation: A meta-analysis. *Exceptional Children*, 53(3), 199-208.
- 44 Ray & Graham, 2019.
- 45 Graham et al., 2012.
- 46 Stotsky, S. (1995). The uses and limitations of personal or personalized writing in writing theory, research, and instruction. *Reading Research Quarterly*, 30(4), 758-776.
- 47 Berninger, V., Nagy, W., Tanimoto, S., Thompson, R., & Abbott, R. (2014). Computer instruction in handwriting, spelling, and composing for students with specific learning disabilities in grades 4 to 9. *Computers and Education*, 81, 154-168; Graham, S. (2008). *The Power of Word Processing for the Reluctant Writer*. Wisconsin: Renaissance Learning Inc; Peterson-Karlan, G. (2011). Technology to support writing by students with learning and academic disabilities: recent research trends and findings. *Assistive Technology Outcomes and Benefits*, 7(1), 38-62.
- 48 Berninger et al., 2014.
- 49 Wells et al., 2016.
- 50 Graham et al., 2012; Ray & Graham, 2019.
- 51 Peterson-Karlan, G. & Parette, H. (2007). *Supporting Struggling Writers using Technology: Evidence-based Instruction and Decision-making*. Illinois State University: Special Education Assistive Technology SEAT Center.
- 52 Peterson-Karlan & Parette, 2007.
- 53 Peterson-Karlan & Parette, 2007.
- 54 Little, C., Clark, J., Tani, N., McDonald Connor, C. (2018). Improving writing skills through technology-based instruction: A meta-analysis. *Review of Education*, 6(2), 183-201.

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