

# We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

5,500

Open access books available

135,000

International authors and editors

165M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index  
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?  
Contact [book.department@intechopen.com](mailto:book.department@intechopen.com)

Numbers displayed above are based on latest data collected.  
For more information visit [www.intechopen.com](http://www.intechopen.com)



# Activity-Based Online Learning: A Response to Dyslexia and COVID

*Charles Potter*

## Abstract

Dr. Charles Potter's Reading Fluency Programme implements individual learning programmes focusing on children's learning needs. The methods and materials can be used in the treatment of dyslexia, as well as for working with children with reading, writing, and spelling difficulties or difficulties with rate of work at school. The programmes are activity-based, and are introduced through online sessions related to the child's individual learning needs as identified through initial assessment and ongoing evaluation. Based on assessment, an individual programme is developed for the child, focusing on areas of need. The programme then uses electronic books, activity books and materials for treatment of phonological and phonemic difficulties, phonic difficulties, as well as linked problems with reading, writing, spelling, reading comprehension and working memory development. This chapter provides theoretical background on the neurolinguistic basis of the programme's methods and materials, which have been developed internationally and implemented pre COVID with both first and second language speakers of English. It also provides information on how the materials have been implemented post COVID using activity-based online learning formats, and the results of children based on pre and post assessments.

**Keywords:** dyslexia, reading, writing, spelling, working memory, electronic materials, activity-based online learning

## 1. Introduction

Dr. Charles Potter's Reading Programme has been previously described in a number of publications. These have documented the theory behind the development of the programme's methods and materials [1], as well as how the methods and materials have been applied in working with children with learning difficulties [2–4].

The programme is both research and evidence-based, and attempts to address reading, writing and spelling problems through activity-based learning targeting the child's specific functional areas of difficulty identified in assessment. As the programme's materials are electronic, they can be sent out by email, and there is a network of parents, teachers and therapists using the programme both locally in the SADEC region as well as internationally in the United Kingdom and in Kenya. The results have been promising, based on effective use of the materials and methods both in individual programmes involving direct physical contact as well as online.

This chapter describes how the approach to activity-based learning has been developed and implemented both prior to COVID as well as post-COVID. Pre-COVID, an activity-based approach was used based on contact sessions with supporting activities provided for implementation at home. During lockdown the activities were adapted for online work. What has been developed post-COVID is an activity-based approach to teaching reading, writing and spelling which can be implemented either through contact sessions or online. As all materials are electronic, this means that the programme can be effective in any locality in the world where parents, teachers, therapists and schools speak English, and have access to electricity and the internet.

## 2. Activity-based learning

Our approach to activity-based learning is based on the neurolinguistic theories of the Russian neuropsychologist Alexander Luria [5–7], who suggested that human mental processes are complex functional systems that involve groups of brain areas working in concert. Each system evolves as the child develops, and makes a unique contribution to the organisation of the central processing conducted by the brain [8].

Based on the theories of Leontiev [9–11] and of Vygotsky [12–14], Luria [15] suggested that the development of higher mental functions takes place in stages. The process of learning is activity-based for the reason that the consolidation process is activity-based. It is based on increasing automaticity, in which a complex cycle of unconnected acts become a highly automatized skill. This principle applies to many different mental functions, including the neurolinguistic functioning involved in development of the ability to read fluently, to write fluently and to spell fluently [16].

## 3. Automaticity in reading

In terms of Luria's conceptualisation of the development of higher mental processes, the development of automaticity in reading is essential for its use in the hierarchical processing of information by the working brain. Following Luria [17], automaticity would be developed in reading when there has been sufficient practice to enable this complex functional act to become fluent enough to form the basis for higher mental processing.

Heckelman [18–19] was the first to record the use of paired reading as a method for increasing reading fluency, while LaBerge and Samuels [20] were the first researchers to focus on automaticity as a function of how reading fluency develops. Samuels [21] suggested that automaticity in reading could be trained through procedures involving repeated reading. As Samuels commented:

*“It is important to point out that repeated reading is not a method for teaching all reading skills. Rather, it is intended as a supplement in a developmental reading program. While the method is particularly suitable for students with special learning problems, it is useful for normal children as well.” [22].*

The association between reading fluency and automaticity has then recurred in subsequent literature, with repeated reading being identified as effective when implemented in a variety of ways, and in a variety of different contexts. Repeated reading has been used effectively as a method for developing reading by

teachers [23–28], parents [29, 30], as well as peer tutors [31–35]. The evidence from these various types of implementation has been positive, effects have often been rapidly obtained, and variations in implementation procedures have produced similar positive effects (e.g. [36–45]).

Overall, automaticity has been associated with the development of both oral reading ability as well as comprehension [46–48]. Based on review and meta-analysis of the literature, the National Reading Panel [49] concluded that there was:

*“a persuasive case that repeated reading and other procedures that have students reading passages orally multiple times while receiving guidance or feedback from peers, parents, or teachers are effective in improving a variety of reading skills. It is also clear that these procedures are not particularly difficult to use; nor do they require lots of special equipment or materials, although it is uncertain how widely used they are at this time. These procedures help improve students’ reading ability, at least through grade 5, and they help improve the reading of students with learning problems much later than this.” [50].*

#### **4. Activity-based methods for developing fluency in reading**

Wolf and Katzir-Cohen [51] have argued that as there are a number of levels of subskills and components in reading fluency instruction, there is a need for curricular strategies in dealing with fluency-based issues. They suggest that increased exploration of the subskills and components of, and issues surrounding, fluency and comprehension will contribute to understanding of both reading development as well as dyslexia subtypes.

The literature also indicates that dyslexia is best conceptualised as a spectrum which is associated with many different aspects as well as deficiencies in a number of areas of functioning [52–55]. What this implies is that reading, writing and spelling difficulties are likely to be complex, and require treatment directed at a number of variables.

For this reason a multivariate approach to fluency-based work is used in our programme. Variables affecting the child’s functioning are identified through assessment. Treatment then focuses on these variables, focusing in particular on effecting change in reading fluency, writing and spelling fluency, as well as in the cognitive and metacognitive skills involved in rapid naming and sequential working memory development. Based on the variables indicated in assessment, the methods used in our programmes are individualised and activity-based. These are introduced through either contact or online sessions, or a combination of these.

Both identification of needs and implementation are thus evidence-based. Based on assessment, an individual programme is developed which targets the child’s individual learning needs through focus on particular variables and their neurolinguistic underpinnings. Implementation then takes place using electronic books, activity books and materials using research and evidence-based methods. Effectiveness of treatment is monitored through ongoing evaluation.

#### **5. The 3 x 3 oral impress method**

The methods used in our programme for developing reading fluency involve repetitive paired reading of sentences at foundation level, and repetitive paired reading of paragraphs once the child is able to read at a basic level. We have used an activity-based method called the 3 x 3 Oral Impress Method effectively [56, 57].

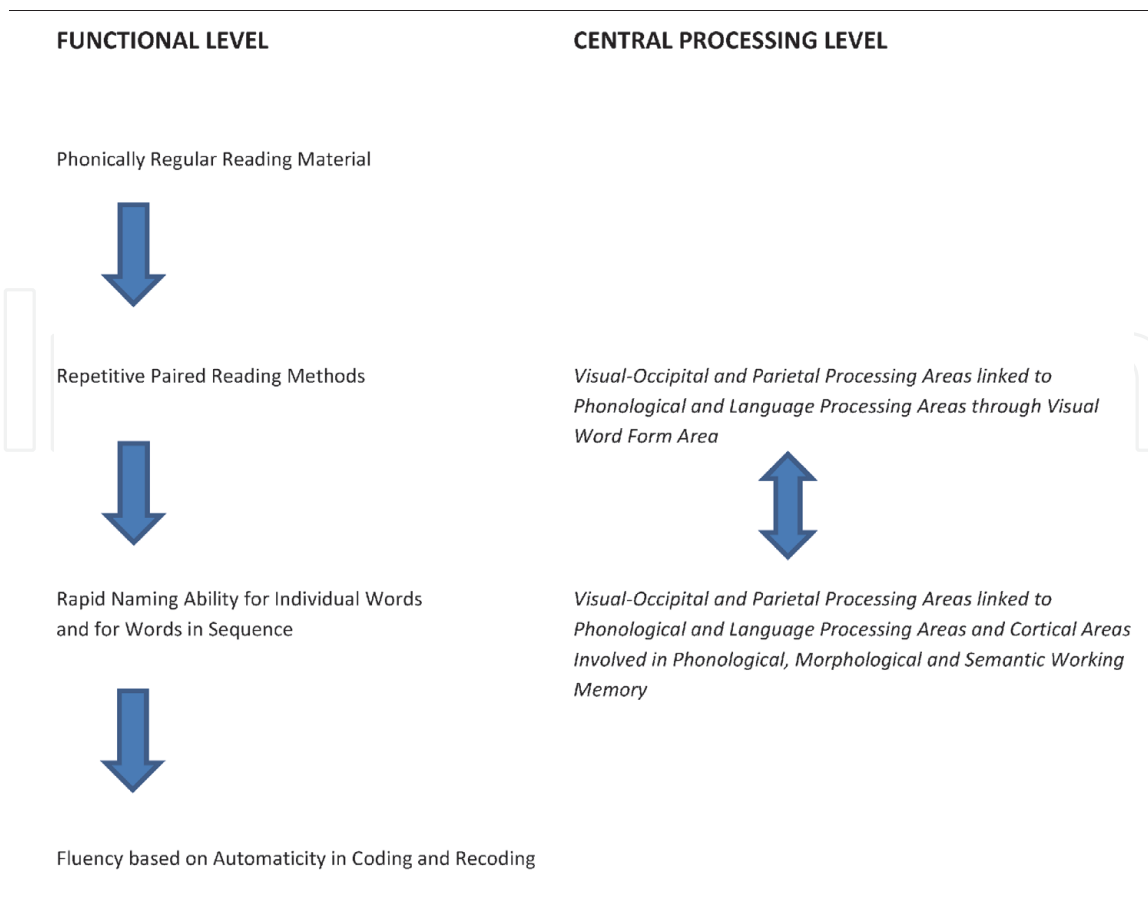
This is designed to stimulate the visual word form area in the brain identified by Dehaene [58, 59] through repetitive exposure to large-print phonically-based material, using repetitive reading and repetition of words in text to develop increased rate of reading based on increased accuracy of phonological decoding as well as lexical familiarity [60–63].

The appropriate starting point in the programme is identified through assessment. A sequence of graded written material is then used based on phonograms and rimes which are embedded in the text of a series of electronic reading fluency books, which can be either sent out by email or purchased online. Each word acts as a stimulus as the brain develops the ability to process increasingly complex phonically based reading material.

Repetitive reading of sentences is conducted at foundation level until the child’s reading skills develop to the level where basic level reading material can be read by the child and a reading partner. Repetitive reading of paragraphs is then introduced, with the reading of each paragraph being repeated three times. After the first three paragraphs have been read repetitively in this way, the next three

<b>Paragraph One</b>	Child reads	Parent and Child read together	Parent reads
<b>Paragraph Two</b>	Parent reads	Child reads	Parent and Child read together
<b>Paragraph Three</b>	Parent and Child read together	Parent reads	Child reads

**Table 1.**  
*The 3 x 3 Oral Impress Method.*



**Table 2.**  
*Model for Reading Fluency Development.*



paragraphs in the story are then read repetitively, with additional repetition taking place through repeated use of words in the text of the books, on the model presented in **Table 1** above.

What this means is that the child is exposed to carefully structured repetitive use of graded reading material using large-print books in which the words and sequences of words are systematically chosen and graded [64]. The amount of text in paragraphs is also limited [65]. The books are printed using on one side of the page only. This is done for visual attentional reasons [66, 67], as well as to reduce clutter [68].

The material is then read repetitively on the model summarised in **Table 2** above, with each paragraph being read three times. In the process, the child is given the active support of a reading partner as well as the repetition of graded phonically-based words and sequences of words necessary to learn to read, and then to read fluently. As with the paired reading methods described by others [69–72], the 3 x 3 Oral Impress Method method is designed to provide an avenue through which a skilled reader (eg a parent, therapist, teacher, tutor or a reading partner) can work with a child, with both the visual cueing and voice of the skilled reader, and the phonic basis of the large-print reading material, providing the associations necessary for reading to develop.

## **6. Similarities and differences to the paired reading methods used by others**

Similar activity-based paired reading methods have been used by others with success. The 3 x 3 Oral Impress Method is similar to the methods developed by Heckelman [73, 74], in involving the child and his or her reading partner in activities involving oral reading. For this reason we follow Heckelman in using the term “impress” because paired reading is used, with the reading partner’s voice being provided and heard by the child, while the child also reads out loud.

As Heckelman [75] has observed, the combining of an external voice and the child’s voice provides continual active involvement in the reading process together with oral stimulation, as well as feedback on whether words are being read correctly. The child thus sees the word, hears the word and speaks the word. The child’s reading partner guides the process of oral reading and repetition.

However, the 3 x 3 Oral Impress Method has the following differences to the paired reading methods used by others.

- It is applied by parents, teachers and therapists using large-print, phonically-based reading material designed and printed in a way which reduces crowding and clutter, which have been identified as factors potentially interfering with focus on the printed word [68].
- It is designed to enable visual tracking to be built into the reading process [76, 77].
- At pre-reading and foundation levels, the materials are designed to integrate reading, writing and spelling with the introduction and teaching of phonemic skills [78]. This is done through use of a structured language experience approach, in which words introduced in the materials are linked with additional vocabulary based on the child’s own language [79].
- Following both Luria [80–82] and Dehaene and co-workers [83–85], repetitive reading of graded large-print phonic material is then used at basic and

intermediate levels in the programme to repeatedly stimulate the areas of the brain involved in the reading process.

- As research indicates that phonological awareness and rapid naming are discrete factors which both influence the development of reading ability [86, 87], rapid naming activities are used side by side with reading fluency, phonic analysis and short-term visual memory activities to increase the child's ability to process words of different alphabetic length rapidly and accurately [88–91].
- At all levels in the materials, variation of order of reading and repetition of paragraphs read is provided by the method, as well as the repetition of particular words within the materials. As the materials are phonically based, they can also be used for phonic analysis, to introduce skills relating to the spelling of individual words, as well as to develop working memory skills relating to the reading and spelling of words in sequence [92].

This means that our programme's fluency materials are normally used for a number of different purposes, as well as for different combinations of reading, writing and spelling activities. The level and sequence of activities is adjusted to suit the learning needs of particular children. With beginning readers, the phonic complexity and the size of unit read can be decreased and the amount of repetition increased. As fluency develops, the size of unit read and its phonic complexity can also be increased and the amount of repetition reduced. Rapid naming of numbers and words is also introduced as an integral part of the programme with the aim of developing rate and accuracy of numerical, orthographic and lexical processing [93].

The neurolinguistic model for reading fluency development used in our programme links activity, function and underlying cortical processing and has been presented in **Table 2** above. It can be summarised as follows:

At the activity level, phonically-based large print materials are used for repetitive paired reading, with the aim of developing rapid and accurate naming of individual words, and words in sequence. At the central level, the repetitive paired reading methods would involve both forward and reverse processing from the visual and occipital areas of the cortex through the different functional sections of the visual word form area to the areas of the cortex involved in phonological and language processing [60, 94].

## 7. Automaticity in writing and spelling

Luria [95, 96] proposed that automaticity is necessary for any act (including reading, writing and spelling) to become fluent. Fluent acts then form the basis for higher level processing. Luria suggested that writing follows other mental processes in being a process which changes on a functional level, and that changes on a functional level reflect greater functional integration in the brain.

The methods used in the initial stages of our programme follow Luria in focusing on memorisation of the graphic form of each letter. We also follow Luria in developing the sounds associated with each letter as the child is exposed to the graphic form of each letter. We thus integrate the introduction of reading, writing and spelling with the introduction of phonics, with the associations developed through a sequence of activities.

The aim is that with practice, the performance on each individual element becomes altered as writing develops into what Luria has called a single "kinetic melody", in which the structures underpinning the process of writing individual

letters become automaticised and integrated. Similar changes also take place in other higher mental processes to which the writing process is linked [97].

What this means is that it is not only the functional structure of the processes of writing and spelling which change as automaticity develops, but also their cerebral organisation, as the activities of writing and spelling start to depend on different systems of concertedly working zones [98]. Following Vygotsky [99], this process of organisation is based on new, intermediate structures of mental processes and new interfunctional relationships which enable the performance of increasingly complex tasks by new methods [100].

Following Luria, the development and assessment of writing and spelling are linked to the development and assessment of reading ability. In our programme, automaticity is thus conceptualised as central to the development of writing and spelling, as a process which enable their development into a single “kinetic melody” [101] capable of supporting the use of reading, writing and spelling in higher mental activity.

## **8. The structured language experience approach**

For the reasons outlined in the previous section, the methods and materials used in our programme are designed to integrate the teaching of writing and spelling with the teaching of reading. The child develops writing based on use of an activity book which is phonically-based, and which introduces the associations between sounds and letters through rhyming word families.

At the foundation level, reading comprehension is taught from the outset. This is done through a process of instruction which is activity-based, using an approach called “The Structured Language Experience Approach”, which is a phonically-based teaching method in which reading, writing, and spelling are integrated with the processes of drawing and illustration [102].

The materials used at foundation level in the programme consist of a series of activity books and reading books, with a set of key words accompanying each reading book. The sequence of words in the activity book is then used to teach sound-letter associations, which are introduced through sets of rhyming words. These are used as the basis for developing sentences for purposes of reading, writing, spelling, language development and comprehension.

To avoid clutter, each page in the activity book consists of a limited number of rhyming words based on short vowel sounds, which are printed on the right hand page. The left hand page is left blank for writing and drawing. The words are then introduced as follows:

- The child first reads the rhyming words and illustrates each word with a picture for comprehension purposes.
- A short sentence is then made with each word on the blank page opposite. Each sentence uses the child’s own language, as well as other words based on short vowel sounds.
- The sentences are read, and then copied by the child into his or her writing book, read again and then illustrated.

Once this has been done, the words and sentences can be typed on the laptop and illustrated with clipart. The child is assisted in this process, and the words and sentences are then printed out on plain paper to form the child’s own language experience reading book.



At foundation level in the programme, the aim of the structured language experience approach is thus to extend the sets of rhyming words in the activity book through a sequence of activities based on the child's own language. This sequence of linked activities enables the rhyming words to be used in sentences which can then be copied, written, read and illustrated. Being based on the child's own language, it is then a small step for the child to be able to read the words in the sentences.

The sentences made in this way are then typed and then printed out as a language experience books. The child is also encouraged to dictate his or her own stories based on his own words and sentences, thus extending the breadth of his or her reading skills.

## 9. Phonological referencing

At both foundation and higher levels in the programme, the activities for developing automaticity in reading, writing and spelling are based on integrating reading, writing and spelling, and follow Frith [103] and Berninger et al. [104] in stressing the need to link the evolving processes of reading and writing. They are also based on use of structured phonics, following Ehri [105, 106], who has suggested that the beginning reader/speller progresses through phases of proficiency related to his or her developing alphabetic and phonological knowledge.

The child's spelling of the rhyming words introduced in the activity books is also tested. This follows Ehri [107, 108] who suggests that orthographic learning comes about through experience with printed language, in the process of which longer and longer letter strings become stored in memory. Children in the final "consolidated alphabetic phase" are able to read fluently as well as spell accurately, by relying upon these stored orthographic representations.

Our methods for teaching spelling in the initial stages thus follow the phonologically and phonically-based stages in spelling described by Moats [109, 110]. Focus is placed on teaching through synthetic phonic approaches incorporating teaching children to isolate sounds and blend sounds into words, as well as how to create families of rhyming words based on similar phonological and phonemic elements. In addition, as the child establishes reading fluency through our foundation level and then our basic readers, our methods use activity-based learning to build the variety of phonic associations necessary to read, write and spell as follows:

- The child is taught to map the associations between the sequences of letters used in words and the sequences of sounds used when words are spoken orally through use of phonogram and rime cards, as well as through a process we call "phonological referencing".
- This is based on the principle that "what we say is what we write." Phonic associations are taught through graded rhyming word activities involving reading, writing and use of working memory in spelling, as well as through activities in which the hand is placed under the chin to increase the ease by which the vowel sounds in words can be identified, and the process of mapping letters to sounds and sounds to letters.
- This enables focus on the vowel sounds in words (which are spoken when the mouth opens) and the consonant sounds (which are made when the mouth closes). These associations are then used to identify the vowel letters and the consonant letters used in written words, and then to link these back to the sounds made when the word is spoken orally.

- Reverse mapping between the sequence of sounds in the word and the letters used in writing the word then takes place. Once the vowel sound in the word has been identified, the letters used to represent the vowel sound are then colour coded. In the process, short vowel sounds are identified as normally being made by one letter working by itself, while long vowel sounds are identified as normally being made by two letters working together.
- As part of the phonological referencing and colour coding process, the child is taught a phonic analysis system called “The Seven Vowel Phonic Analysis System” [111] in which the child learns that a, e, i, o and u are the letters normally used to represent the vowel sounds in words, but that y and w can also be used to represent the represent the vowel sounds in positions at or near the end of written words in English.

The Seven Vowel Phonic Analysis System is then worked with and applied through activities in which the letters used to represent the vowels are identified through phonological referencing. Through activity-based learning the child learns that there needs to be a vowel in every word, and that the letters a, e, i, o and u are used to represent the vowels in all positions in words, and that the use of y and w as vowels at the end of words is both logical and consistent, applying to nearly all words in English. The system thus aims to make written English as transparent as Welsh, in which the use of the seven vowels a, e, i, o, and u, as well as y and w, also applies [112, 113].

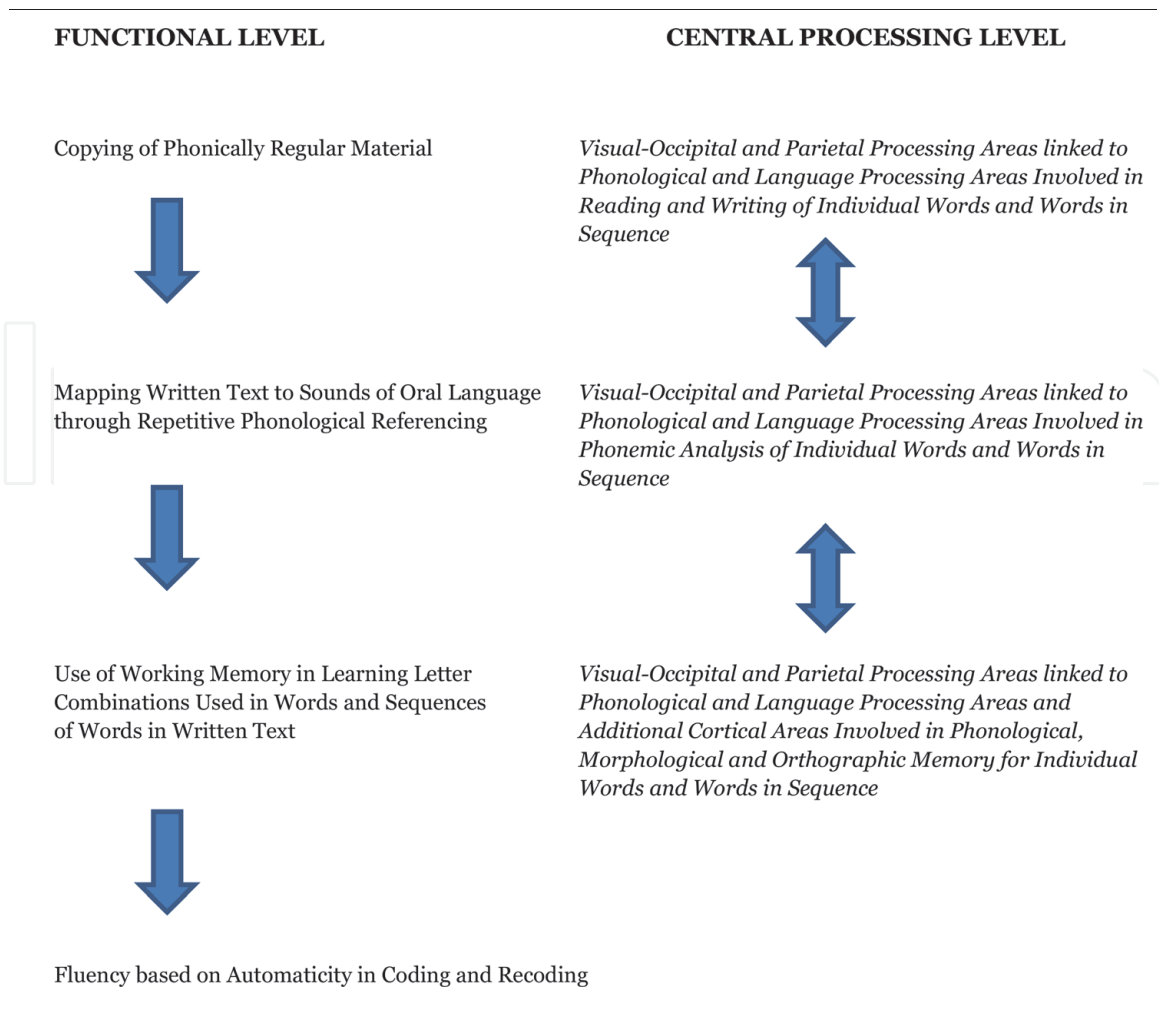
## **10. Developing phonic associations as the basis for learning to spell**

At foundation level and at reading ages up to 8 years of age, our programme would follow Moats [114, 115] in targeting phonic associations in a hierarchy in which words based on short vowel sounds would be introduced first, followed by words in which more than one letter is used to represent the vowel sounds. A set of phonic inventories is used both during initial assessment as well as during programme implementation to establish the phonic associations the child knows and does not know.

Particular phonic associations are targeted using phonogram and rime cards, as well as materials based on sets of rhyming words supported by sentences which use the rhyming words in context. Phonological referencing is then introduced on this phonically based material, focusing on how the sounds made when speaking a word orally can be mapped directly to the letters used in writing the word. Once the child has been exposed to phonological referencing using written material based on families of rhyming words, the Seven Vowel Phonic Analysis System is introduced, working with the phonically-based material in our reading fluency books.

The process of developing writing and spelling fluency is then based on a sequence of phonic analysis activities which are undertaken repetitively. The aim is to use accuracy in use of sequential working memory for words to provide the building blocks for developing fluency and automaticity in writing and spelling. The neurolinguistic model for writing and spelling fluency development links activity, function and underlying cortical processing and is summarised in **Table 3**.

The model is applied repetitively and iteratively through activity-based methods, using forward and reverse processing between oral and written language to demonstrate that “what we say is what we write.” The activities involved in repetitive phonological referencing are then used as the basis for developing rapid and accurate use of working memory for individual words, and words in sequence.



**Table 3.**  
*Model for Writing and Spelling Fluency Development.*

### 11. The seven vowel phonic analysis system

It will be clear from the previous section that the Seven Vowel Phonic Analysis System is an activity-based procedure for teaching how to map the combinations of letters used in writing words to the sounds made when those words are spoken orally. It focuses in particular on developing skills in word attack as well as in spelling, through focusing on the letters and letter combinations used to represent the vowel sounds in words.

Based on Oaks [116], the Seven Vowel Phonic Analysis System focuses on the vowel situation in words. Following Luria [117–119] it teaches the associations between sounds and letters repetitively, working with paragraphs drawn from the phonically-based material in our reading fluency books. As the written language in these is carefully structured and graded, it is a small step to using the material in the books for activities involving phonological referencing.

The Seven Vowel Phonic Analysis System is designed to make written English more transparent as compared to transparent orthographies such as Italian or Afrikaans or Welsh. This increases the ease with which the child can apply the universal phonic principle to the task involved in learning to read, write and spell in English [120–122]. Difficulties in developing linguistic awareness and the universal phonic principle are thus assisted, as suggested by McCutchen [123], by introducing the metacognitive strategies involved in using the Seven Vowel Phonic Analysis System, with the aim of increasing the consistency with which the letters used to

Work with phonic weaknesses	→	Target specific types of phonic errors made by child
Teach phonic analysis skills	←	Work with seven letters to increase vowel transparency
Train working memory for words	←	Combine phonic analysis and mental imagery in revisualisation
Train sequential memory for words	←	Work with sequential revisualisation and dictation
Address spelling errors	←	Work with phonograms and rimes

**Table 4.**  
*Model for Development of Sequential Working Memory for Words.*

represent the vowel sounds in the English language can be mapped back to the sounds made when words are spoken orally [124].

This is done through an activity-based method based on five steps:

Step One: A descriptive paragraph from the child’s reading fluency book is copied into the child’s writing book.

Step Two: The letters representing the vowels in each word are identified by placing the hand under the chin and then underlined in colour.

Step Three: Target words (defined as words in which more than one letter is used to represent the vowel sounds) are then analysed using phonological referencing.

Step Four: The target words are then written, occluded by being covered with the non-dominant hand, and then written again from memory.

Step Five: The sequence of words in the sentences in the paragraph is revisualised and then tested in sequence through dictation.

This five step procedure is then used repetitively, with the aim of providing the phonic analysis and sequential working memory skills necessary for the development of writing and spelling fluency. This is done through a sequence of activities designed to develop the ability to use phonologically-based, phonically-based and visually-based sequential working memory skills.

The sequence of activities is called “targeted revisualisation”. It is called “targeted” as the learning process focuses on target words (words in which more than one letter is used to represent the vowel sounds), which are then analysed using the Seven Vowel Phonic Analysis System and then learned using computer-based visualisation techniques. The process of targeted revisualisation involves the child in revisualising individual words, by first speaking the sequence of letters seen in the mind while visualising the words, and then using sequential working memory to write both individual words and sequences of words from memory.

How to do this has been presented in **Table 4** above, and is described in the next section.

## 12. The targeted analysis, revisualisation and sequential spelling programme (TARSP)

The Targeted Analysis, Revisualisation and Sequential Spelling Programme [125] is based on indications from the literature that even in pictographic written language systems like Chinese, children learn to read using phonic strategies



[126, 127]. In introducing the Targeted Analysis, Revisualisation and Sequential Spelling Programme, the child is taught through combining phonic analysis and revisualisation in activities designed to develop sequential working memory for words.

This is done as follows:

Step One: The child uses the Seven Vowel Phonic Analysis System to identify the target words (words in which more than one letter is used to represent vowel sound) from a graded written paragraph, and lists these in his or her writing book.

Step Two: The child types the target words on the laptop and uses phonological referencing to identify and then colour code the letters used to represent the vowel sounds in each target word.

Step Three: The child is taught how to revisualise the target words using a combination of phonic analysis and mental imagery.

Step Four: The accuracy with which the child remembers the target words is then tested by writing the individual words from memory.

Step Five: The child is taught how to use sequential working memory to recall the form and structure of the words in the paragraph in sequence. This is done by teaching the child how to revisualise and recall the sequences of letters used both in the individual words, as well as how to revisualise and recall the sequences of words used in sentences and paragraphs.

Step Six: Errors made by the child in writing the words and sequences of words from memory are identified. Phonic associations are taught using phonograms and rimes. The error words are then phonologically referenced, learned through occlusion and used in written sentences.

The process of targeted revisualisation thus involves work in four areas (phonic analysis based on phonological referencing, revisualisation, developing sequential working memory for words, and systematic phonic instruction targeting the spelling errors made by the child). These are linked through a sequence of activities, each of which plays an integral part in developing accuracy in use of sequential working memory, as described in the section following.

### **13. Developing sequential working memory for words**

The aim of the Targeted Analysis, Revisualisation and Sequential Spelling Programme is to develop sequential memory for written words, based on the evidence of a common linguistic awareness manifesting in phonological, orthographic, and morphological awareness as suggested by Berninger et al. [128, 129]. It applies phonic principles in analysing and recalling words in sequence, based on the evidence of a universal phonic principle manifesting across different orthographies as suggested by Perfetti, Zhang and Berent [130] (1992). Following McCutchen [131], the Targeted Analysis Revisualisation and Sequential Spelling Programme aims to develop linguistic awareness through the metacognitive strategies involved in phonological referencing, as the basis for developing sequential working memory for words.

The process of targeted revisualisation is based on a sequence of visually cued phonic analysis and phonological referencing activities which are undertaken repetitively. The aim is to develop accuracy in use of sequential working memory for words to provide the building blocks for developing fluency and automaticity in writing and spelling. This is done through repetitive activities undertaken in four stages, as follows (Table 5).



Level of Mediation	Focuses of Phonic Analysis	Focuses of Mental Imagery and Revisualisation	Focuses of Use of Sequential Working Memory
<b>Stage One: Focus on Words based on Short Vowel Sounds</b>	Introduce concept that vowels are used in all spoken and written words. Identify and mediate short vowel sounds a, e, i, o, and u.	Construct, deconstruct, mentally image and revisualise words and rhyming word families containing short vowel sounds.	Use working memory in writing rhyming words based on short vowel sounds in sequence.
<b>Stage Two: Focus on Words based on Long Vowel Sounds</b>	Identify and mediate long vowel sounds involving use of digraphs involving a, e, i, o, and u. Introduce the letters y and w as vowels in positions at or near the end of words.	Construct, deconstruct, mentally image and revisualise words and rhyming word families containing long vowel sounds, including use of the letters y and w as vowels in positions at or near the end of words.	Use working memory in writing sequences of words containing both long and short vowel sounds, including use of the letters y and w as vowels in positions at or near the end of words.
<b>Stage Three: Focus on Sequentialisation of Words in Sentences</b>	Identify letters used as vowels in words used in sequence in sentences.	Identify, phonically analyse, mentally image and revisualise single syllable and polysyllabic words in sequence in sentences.	Use working memory in writing single syllable and polysyllabic words in sequence in sentences and sequences of sentences..
<b>Stage Four: Focus on Sequentialisation of Words and Sentences in Paragraphs</b>	Identify letters used as vowels in words used in sequence in sentences, and in sentences used in sequence in paragraphs.	Identify, phonically analyse, mentally image and revisualise single syllable and polysyllabic words in sequence in paragraphs.	Use working memory in writing sentences in sequence in paragraphs of increasing length and phonic complexity.

**Table 5.**  
*Summary of Stages and Focuses of Mediation in the Targeted Analysis, Revisualisation and Sequential Spelling Programme.*

On a phonological and phonic level, the model is based on the coding and recoding of phonic associations through activities in which the child writes, types and colour codes the vowels in words, by underlining the letters used to represent the vowel sounds in colour as well as using the colour coding feature in a word processing programme. On a visual level, the model is designed to make the letters used to represent the vowel sounds in words stand out in colour.

As this occurs, both the phonic associations and visual contrasts used to identify the letters representing the vowel sounds in words are used to develop working memory for words as well as sequential working memory. Fluency in writing and spelling is then based on increasing automaticity in recalling the sequences of letters used in individual words, the sequences of words used in sentences, and the sequences of sentences used in paragraphs. Spelling errors made by the child are retaught using methods based on phonological referencing, occlusion and use of an electronic tachistoscope.

## 14. Implementation and results pre COVID

Pre COVID, our methods and materials for developing automaticity in reading, writing and spelling were implemented over a number of years through contact

sessions in my practice, as well as by a network of other therapists, teachers and parents using our methods and materials. From first interventions using large-print phonically based materials in the 1990's to the date of lockdown in our country in March 2020, positive results were obtained which have been presented in a number of previous publications on the programme [132–135]. These can be accessed online by clicking on the links in these references at the end of this chapter.

Based on aggregation of the individual case study analyses of results obtained through use of the programme's materials and methods, longitudinal trends in the data indicated that the following variables influenced successful implementation of the programme over an eight year period:

- Consistent and regular exposure to phonological and phonic instruction to provide a foundation of basic skills on which the fluency interventions in the programme can be built;
- Consistent implementation of methods designed to improve both reading fluency and writing and spelling fluency to produce the greatest likelihood of positive effects; and
- Consistent support from parents in programme implementation to produce the greatest likelihood of positive effects.

Where the above variables have applied, results post-COVID have also been consistently good, based on contact implementation, online implementation as well as implementation strategies involving combinations of online and contact implementation. These are described in the section following.

## 15. Strategies for programme implementation post COVID

COVID lockdown presented a number of challenges, but also provided a number of opportunities. Many of the challenges stemmed from my own decision to discontinue contact sessions in my practice until such time as a vaccine became available. This led to a variety of additional strategies for implementing our materials and methods, using formats involving online sessions supported by additional home-based sessions for children.

Examples of the types of format used are presented in **Tables 6** and **7** below.

The formats enabled parents and tutors to work with children using a variety of different types of activities linked to materials which were delivered by email over the lockdown period. This then provided opportunities for extending the range of online services provided by my practice as well as the extent of materials, methods and assessment tools used for online work.

As the schools also moved to online work, each child's programme was individually designed to develop the basic skills necessary to be able to complete the assignments being set by the child's classroom teacher. Both the programme provided by the child's school and our own programme activities would then be supported by either the child's parent or a tutor.

It thus became possible to provide an activity-based individual programme for the child drawing on the following types of materials from my practice's data-base:

- a. Materials and methods for work with phonic skills and phonic analysis.
- b. Materials and methods for reading fluency development.

	First activity	Second activity
<b>Day One</b>	Test-based Language Programme Level One Test 2 Creative writing activity Use key words to write a story, then draw the picture. Then use Google dictate to tell the story and get the spelling right.	Language analysis Circle nouns 2
<b>Day Two</b>	Use Level Two Phonogram and Rime Cards to build the following rhyming word family The ou digraph The ou Family out shout gout trout found bound mound loud cloud proud house mouse louse grouse Write these words in your writing book. Then underline the vowels in each word in colour. Test the spelling of the words. Illustrate each word for comprehension purposes.	Now write the following sentences in your writing book. I am very proud of you. She found the ring in the sand. Can you see out of the car? They want to go into the house. There was a black cloud in the sky. This band is quite loud. There is a white mouse in her room. He will shout my name. Underline the vowels in each word in each sentence in colour. Test the spelling of the words in each sentence in sequence through dictation. Then illustrate each sentence for comprehension purposes.
<b>Day Three</b>	Maths activity: Test-based Maths System Level One Test 2 Input output rules Finding number patterns	Maths extension activity: Level 1: input output charts a Level1: find number patterns a Rapid naming activity Level 1: adding objects b Level 1: counting patterns -b
<b>Day Four</b>	Test-based Language Programme Level One Test 2 Written language activities	Phonic Analysis Level 2: phonics long vowels b

*Add:*

*Daily repetitive paired reading on basic evel reading fluency book.*

*Daily work in Level One phonic workbook or in Level Six foundation level activity book.*

*Daily maths activities on maths website.*

**Table 6.**

*Activity-based Learning Format Designed for Work with an 8 year old child. Learning Cycle Eleven implemented on July 18th 2020*

- c. Materials for language skills development.
- d. Structured language experience activities.
- e. Materials for reading comprehension development.
- f. Cloze activities.
- g. Activities for identifying main ideas and summarising skills.
- h. Reading activities based on use of the internet.
- i. Materials and activities for descriptive and creative writing development.
- j. Materials and methods for word analysis and working memory development.

- k. Materials and methods for sequential working memory development.
- l. Writing and spelling fluency activities involving phonic analysis and revisualisation.
- m. Materials and methods for developing rapid naming and rapid processing abilities.
- n. Listening skill and auditory processing activities based on use of audible books.
- o. Test-based language and maths activities.
- p. Problem-solving techniques and activities.

Post COVID, feedback on how the child has coped with each type of activity is provided by photographs sent by email or WhatsApp, enabling the next format in the child’s programme to be evidence-based, linked to ongoing evaluation of learning needs. Assessment is then built into programme implementation at regular intervals. The model used for implementation is action research based, and is presented in **Table 8** on the next page.

As the practice’s data-base is extensive, the planning and implementation model summarised in **Table 8** implies that each child’s programme can be multivariate, addressing a number of different learning needs through use of a variety of graded activities. The programme is then implemented using online sessions supported by learning materials provided by email. The aim is that programme implementation can take place with support from parents or tutors, working with a variety of electronic materials made accessible online via links to websites, or delivered by email. Methods used in the programme are documented in illustrated implementer manuals, and are demonstrated working online, supported by cellphone and email contact.

	First activity	Second activity	Third activity
<b>Day One</b>	Test-based Language Programme Level One Test 8 Creative language activity Planning of creative writing combining divergent thinking and convergent thinking methods	Working memory activity using revisualisation methods: Identification of target words from graded revisualisation paragraph 21 followed by phonological referencing and colour coding of letters used to represent the vowel sounds in words in writing book and then on laptop. Syllabification and testing of target words	Sequential revisualisation of words and sentences in paragraph 21 Testing of sequential working memory for words in paragraph 21 through dictation
<b>Day Two</b>	Test-based Maths Programme Level Three Test 1 Comparison of numbers up to four digits Arrangement of numbers up to four digits according to size	Maths extension activity: level-3: compare numbers a level 3: order numbers a Rapid naming activity: Level 2: multiplication tables 2, 5 and 10 b Level 2: multiplication table 2 missing factor b	Language comprehension activity: Endangered species

	First activity	Second activity	Third activity
<b>Day Three</b>	Test-based Language Programme Level One Test 8 Written language activities	Descriptive writing A bicycle Use what, where, when, how and why questions to describe a bicycle. Use the internet to help you.	Maths/science comprehension activity Magnetic attraction
<b>Day Four</b>	Self-structured listening activity using Audible book, followed by review stating what the passage in the book is about, how it has been interpreted and enjoyed, and on the basis of this evidence whether the book is a good one with a message that speaks successfully to the reader.	Natural science comprehension: Atmospheric layers.	Error analysis: Correction of spelling errors made in summary – Learn error words using occlusion and use error words in sentences. Then work with rapid naming of error words using tachistoscope.

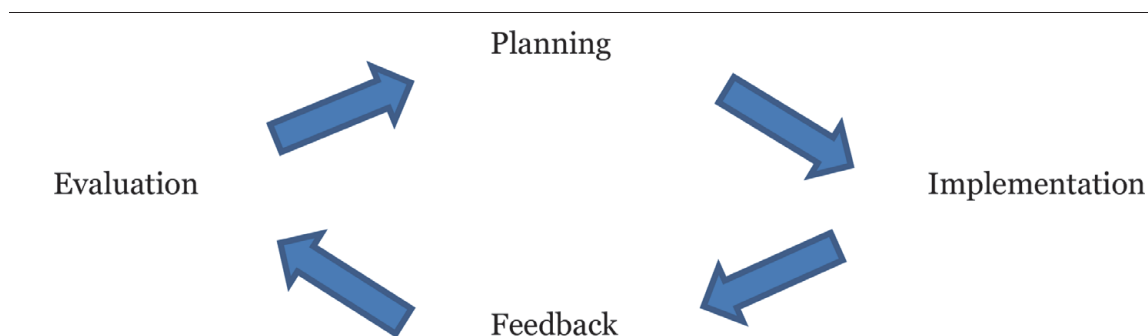
*Add:*

*Daily repetitive paired reading on intermediate level reading fluency book.*

*6 word a day long term memory spelling programme (6 words a day times three days, learn and test the fourth day, learn any errors using occlusion and use error words in sentences). Use tachistoscope for rapid naming and writing based on use of short-term visual memory.*

**Table 7.**

*Activity-based Learning Format Designed for Work with a 12 year old child: Learning Cycle Five implemented 29<sup>th</sup> April 2020*



**Table 8.**

*Action Research Cycle for Planning and Implementation of Activity-based Online Programmes.*

## 16. Changes in assessment and training post COVID

COVID has also presented challenges and opportunities in both assessment and training in programme use. Pre COVID, assessment was undertaken through contact sessions, through a number of tests administered across the table. Programme implementation then took place working with therapists, teachers, tutors and parents who were trained in programme implementation through a mediated training programme.

Post COVID, the programme has developed assessment strategies involving combinations of contact and online work. Contact testing is conducted both locally and internationally, working in association with other therapists located in areas close to where children live. This is then supplemented by online testing, with the aim of developing an individual programme relevant to the child learning needs, at a level of language, reading, writing and spelling appropriate to the child's basic skills, and varied in terms of the child's individual needs.



Implementation then takes place through online sessions supported by learning formats based on materials and methods drawn from the electronic data base, with each activity focused on the child's learning needs. Training is provided to programme users as an integral part of the process. Manuals are provided to assist parents, teachers, therapists and tutors in implementing the reading, writing, spelling and working memory activities which form the basis of each child's programme. Additional support is also provided to programme users through training materials, as well as through sessions conducted online with the therapists, teachers and parents who work in association with my practice.

A number of parents, therapists and teachers are currently working with the practice's methods and materials, both in the SADEC countries as well as in the UK and East Africa. What has developed in response to COVID are combinations of contact and online assessment and training. With increased use of online technology, it has been possible to plan sessions and work online with others using the programme's methods and materials, and in the process to demonstrate which activities work best, how to implement activity-based learning using the programme's methods and materials, and exactly what to do step by step. This has led to forms of shared planning and implementation, supported by electronic materials and manuals.

These are exciting developments in which there are many possibilities for work in different geographical areas of our own country, which is culturally, linguistically and socio-economically diverse, but which uses English as the basis for schooling, commerce and the market-place. It has also led to both interest and implementation possibilities in other countries in which English is spoken and used as the basis for work in schools, as well as more broadly in society.

## **17. Summary and evaluation**

The reading, writing and spelling fluency programmes described in this chapter are activity-based, and are introduced through online sessions related to the child's individual learning needs as identified through initial assessment and ongoing evaluation. Based on evidence provided by testing, an individual programme is developed for the child based on areas of need. Electronic books, activity books and activity-based materials are then used to develop automaticity in reading, and automaticity in writing and spelling, as well as to focus on linked difficulties in phonological and phonemic development, rapid naming and working memory development.

The methods and materials described in this chapter can be used as a response to dyslexia as well as for work with children whose skills in reading, writing and spelling are not well developed. Reading fluency is initially targeted, together with the development of phonic associations based on use of phonogram and rime cards as well as rhyming word families. Once observable differences in reading fluency are noted, reading comprehension activities are introduced together with visually cued phonic analysis based on phonological referencing methods, which are used as the basis for developing writing and spelling fluency.

Following Jorm and Share [136–140], the phonological referencing methods used in a child's programme are based on the teaching of skills for phonological recoding (print-to-sound translation, as well as translation of sound back to print). Phonic analysis and revisualisation are then used in combination to develop the detailed orthographic representations necessary for fast, efficient visual word recognition, as well as the detailed orthographic representations necessary to spell both individual words and words in sequence.

The methods used in our fluency-based programmes are thus multivariate, based on use of a combination of repetitive paired reading, repetitive phonological referencing, as well as the training of rapid naming and sequential working memory skills. The evidence from aggregated case studies of children who have worked with a combination of the methods described in this chapter indicates that there are benefits in improvement in reading, spelling individual words and spelling words in sequence, with backwash effects occurring across these areas. Case contrasts indicate lessened effects from programme implementation where there has been systematic variation in either the implementation of repetitive paired reading or repetitive phonological referencing using the methods described in this chapter, and in previous chapters on the programme [141–144].

Post COVID, both contact and online implementation have been undertaken in which materials from the practice's data-base are used in interactive sessions with children, with supporting manuals and training materials delivered to users by email. Each child's programme is then supported with formats designed to provide an activity-based learning programme focused on the child's learning needs. Training can also be provided to users interactively and step by step, with methods demonstrated either through contact or online, supported by implementation material, training material and illustrated manuals.

This hybrid assessment, training and implementation model has evolved as a response to the needs for social distancing required by COVID. The interventions with each child can be flexible as well as multivariate, and can be provided both locally and internationally wherever the internet and email are available. Both results and user evaluations are positive, indicating that there are a number of possibilities for post COVID implementation of the programme with children with reading, writing and spelling difficulties, and as well as with therapists, teachers and parents working with dyslexic children in different geographic areas and different countries.

IntechOpen


## **Author details**

Charles Potter

Psychologist in Private Practice, Johannesburg, South Africa

\*Address all correspondence to: [pottercs@gmail.com](mailto:pottercs@gmail.com)

## **IntechOpen**

© 2021 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

## References

- [1] Potter, C.S. (2015) Using Phonically Based E-books to Develop Reading Fluency. In B. Gradinarova (Ed.), *E-Learning - Instructional Design, Organizational Strategy and Management*. Rijeka: InTech, DOI: 10.5772/61607. Available from: <http://www.intechopen.com/books/e-learning-instructional-design-organizational-strategy-and-management/using-phonically-based-e-books-to-develop-reading-fluency>
- [2] Potter, C.S. (2017a). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part One: Theory and Assessment. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <https://www.intechopen.com/books/learning-disabilities-an-international-perspective/developing-automaticity-in-children-with-learning-disabilities-a-functional-perspective-part-one-the>
- [3] Potter, C.S. (2017b). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part Two: Programme Methods and Materials. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <http://www.intechopen.com/articles/show/title/developing-automaticity-in-children-with-learning-disabilities-a-functional-perspective-part-two-pro>
- [4] Potter, C.S. (2019). Training Reading, Writing and Spelling Fluency: Centre-Periphery Dissemination through Interactive Multimedia. In D. Cvetković (Ed). *Interactive Multimedia - Multimedia Production and Digital Storytelling*. London: InIntech, Available from: <https://www.intechopen.com/books/interactive-multimedia-multimedia-production-and-digital-storytelling/training-reading-writing-and-spelling-fluency-centre-periphery-dissemination-through-interactive-mul>
- [5] Luria, A. R. (1966). *Higher cortical functions in man*. London: Tavistock Publications.
- [6] Luria, A.R. (1973). *The working brain: An introduction to neuropsychology*. Harmondsworth, Penguin Education.
- [7] Luria, A. R. (1976). *Basic problems of neurolinguistics* (Vol. 73). Berlin: Walter de Gruyter.
- [8] Kostyanaya, M. I., and Rossouw, P. (2013). Alexander Luria – life, research and contribution to neuroscience. *International Journal of Neuropsychotherapy*, 1(2), 47–55.
- [9] Leontiev, A. N. (1931). Razvitie pamyati [Development of memory]. *Moskva-Leningrad: Uchpedgiz*, 27–198.
- [10] Leontiev, A. N. (1959) (a). Problems in Mental Development. Moscow: *Moscow: Izdstel'sto Pedagogical Academy*.
- [11] Leontiev, A. N. (1959) (b). Principles of child mental development and the problem of intellectual backwardness. *Educational Psychology in the USSR*, 68–82.
- [12] Vygotsky, L. (1934). *Thought and language*. Trans. E. Hanfmann and G. Vakar, Cambridge MA: MIT Press.
- [13] Vygotsky, L. S. (1956). *Selected psychological investigations*. Moscow: Izdstel'sto Pedagogical Academy.
- [14] Vygotsky, L. S. (1960). Razvitie vysshikh psikhicheskikh funktsii [Development of the Higher Mental Functions]. Moscow: *Publishing House of the R.S.F.S.R. Academy of Pedagogical Sciences*, pp 13–223.
- [15] Luria, A. R. (1966). *Higher cortical functions in man*. London: Tavistock Publications, pp 35–36.

- [16] Luria, A. R. (1976). *Basic problems of neurolinguistics* (Vol. 73). Berlin: Walter de Gruyter.
- [17] Luria, A. R. (1966). *Higher cortical functions in man*. London: Tavistock Publications, pp 423–431.
- [18] Heckelman, R.G. (1962). *A neurological impress method of reading instruction*. RG Heckelman - 1962 - Merced CA: Merced County Schools Office.
- [19] Heckelman, R.G. (1969). A neurological-impress method of remedial-reading instruction. *Academic Therapy*, 4 (4), 277–282.
- [20] Laberge, D. and Samuels, J.S. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, 6 (2), 293–323.
- [21] Samuels, S.J. (1979). *The method of repeated readings*. *The Reading Teacher*, 32, 4, 403–408.
- [22] Samuels, S.J. (1979). *The method of repeated readings*. *The Reading Teacher*, 32, 4, p 403.
- [23] Dowhower, S. L. (1987). Effects of repeated reading on second-grade transitional readers' fluency and comprehension. *Reading Research Quarterly*, 389–406.
- [24] Dowhower, S. L. (1994). Repeated reading revisited: Research into practice. *Reading and Writing Quarterly: Overcoming Learning Difficulties*, 10 (4), 343–358.
- [25] O'Shea, L. J., Sindelar, P. T., and O'Shea, D. J. (1985). The effects of repeated readings and attentional cues on reading fluency and comprehension. *Journal of Reading Behavior*, 17 (2), 129–142.
- [26] O'Shea, L. J., Sindelar, P. T., and O'Shea, D. J. (1987). The effects of repeated readings and attentional cues on the reading fluency and comprehension of learning disabled readers. *Learning Disabilities Research*, 2 (2), 103–109.
- [27] Topping, K. (1989). Peer tutoring and paired reading: Combining two powerful techniques. *The Reading Teacher*, 42 (7), 488–494.
- [28] Topping, K. (1995). *Paired, Reading, Spelling and Writing: The Handbook for Teachers and Parents*. London: Cassell.
- [29] Topping, K. (1987) (a). Paired reading: A powerful technique for parent use. *The Reading Teacher*, 40 (7), 608–614.
- [30] Topping, K. (1995). *Paired, Reading, Spelling and Writing: The Handbook for Teachers and Parents*. London: Cassell.
- [31] Miller, A. D., Barbetta, P. M., & Heron, T. E. (1994). START tutoring: Designing, training, implementing, adapting, and evaluating tutoring programs for school and home settings. *Behavior analysis in education: Focus on measurably superior instruction*, 265–282.
- [32] Rasinski, T. V., Padak, N., Linek, W., and Sturtevant, E. (1994). Effects of fluency development on urban second-grade readers. *The Journal of Educational Research*, 87(3), 158–165.
- [33] Stoddard, K., Valcante, G., Sindelar, P., O'Shea, L., and Algozzine, B. (1993). Increasing reading rate and comprehension: The effects of repeated readings, sentence segmentation, and intonation training. *Literacy Research and Instruction*, 32 (4), 53–65.
- [34] Topping, K. (1987) (b). Peer tutored paired reading: Outcome data from ten projects. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 7 (2), 133–145.
- [35] Topping, K. (1989). Peer tutoring and paired reading: Combining two



powerful techniques. *The Reading Teacher*, 42 (7), 488–494.

[36] Dowhower, S. L. (1987). Effects of repeated reading on second-grade transitional readers' fluency and comprehension. *Reading Research Quarterly*, 389–406.

[37] Dowhower, S. L. (1994). Repeated reading revisited: Research into practice. *Reading and Writing Quarterly: Overcoming Learning Difficulties*, 10 (4), 343–358.

[38] Gilbert, L. M., Williams, R. L., and McLaughlin, T. F. (1996). Use of assisted reading to increase correct reading rates and decrease error rates of students with learning disabilities. *Journal of Applied Behavior Analysis*, 29 (2), 255–257.

[39] O'Shea, L. J., Sindelar, P. T., and O'Shea, D. J. (1987). The effects of repeated readings and attentional cues on the reading fluency and comprehension of learning disabled readers. *Learning Disabilities Research*, 2 (2), 103–109.

[40] Rasinski, T. V. (1990). Effects of repeated reading and listening-while-reading on reading fluency. *The Journal of Educational Research*, 83 (3), 147–151.

[41] Therrien, W. J., and Kubina Jr, R. M. (2006). Developing reading fluency with repeated reading. *Intervention in School and Clinic*, 41 (3), 156–160.

[42] Topping, K. (1987) (b). Peer tutored paired reading: Outcome data from ten projects. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 7 (2), 133–145.

[43] Topping, K. (1989). Peer tutoring and paired reading: Combining two powerful techniques. *The Reading Teacher*, 42 (7), 488–494.

[44] Topping, K. J. and Lindsay, G. A. (1992). *Paired reading: a review of the*

*literature*. *Research Papers in Education*, 7 (3), 199–246.

[45] Topping, K. and Wolfendale, S. (Eds.) (1985). *Parental involvement in children's reading*. New York: Nichols.

[46] Levy, B. A., Nicholls, A., and Kohen, D. (1993). Repeated readings: Process benefits for good and poor readers. *Journal of Experimental Child Psychology*, 56 (3), 303–327.

[47] Stoddard, K., Valcante, G., Sindelar, P., O'Shea, L., and Algozzine, B. (1993). Increasing reading rate and comprehension: The effects of repeated readings, sentence segmentation, and intonation training. *Literacy Research and Instruction*, 32 (4), 53–65.

[48] Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special Education*, 25(4), 252–261.

[49] National Reading Panel (US), National Institute of Child Health, & Human Development (US). (2000). Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups. National Institute of Child Health and Human Development, National Institutes of Health.

[50] National Reading Panel (US), National Institute of Child Health, & Human Development (US). (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health, Chapter 3, p. 3–20.



- [51] Wolf, M., and Katzir-Cohen, T. (2001). Reading fluency and its intervention. *Scientific Studies of Reading*, 5 (3), 211–239.
- [52] Elliott, J. G., and Grigorenko, E. L. (2014). *The dyslexia debate* (No. 14). New York: Cambridge University Press.
- [53] Nicolson, R. (2016). Developmental dyslexia: The bigger picture. In J. Elliott and R. Nicolson, *Dyslexia: Developing the Debate*. Lond.on: Bloomsbury, pp. 5–72.
- [54] Nicolson, R. I., and Fawcett, A. J. (1995). Dyslexia is more than a phonological disability. *Dyslexia-Chichester-*, 1, 19–36.
- [55] Wolf, M. and Bowers, P. G. (1999). The double-deficit hypothesis for the developmental dyslexias. *Journal of Educational Psychology*, 91 (3), 415–438.
- [56] Potter, C.S. (2012). *The 3 x 3 Oral Impress System: A manual*. Electronic copy available from my practice by emailing me at [pottercs@gmail.com](mailto:pottercs@gmail.com)
- [57] Potter, C.S. (2015) Using Phonically Based E-books to Develop Reading Fluency. In B. Gradinarova (Ed.), *E-Learning - Instructional Design, Organisational Strategy and Management*. Rijeka: InTech, DOI: 10.5772/61607. Available from: <http://www.intechopen.com/books/e-learning-instructional-design-organizational-strategy-and-management/using-phonically-based-e-books-to-develop-reading-fluency>
- [58] Dehaene, S. (2009). *Reading in the brain*. New York: Penguin Books.
- [59] Dehaene, S. (2020). *How we learn: Why brains learn better than any machine... for now*. New York: Penguin Books.
- [60] Ben-Shachar, M., Dougherty, R.F., Deutsch, G.K. and Wandell, B.A. (2007). Differential Sensitivity to Words and Shapes in Ventral Occipito-Temporal Cortex. *Cerebral Cortex*, 17 (7), pp. 1604–1611.
- [61] Hannagan, T., Amedi, A., Cohen, L., Dehaene-Lambertz, G. and Dehaene, S. (2015). Origins of the specialisation for letters and numbers in ventral occipitotemporal cortex. *Trends in Cognitive Sciences*, 19 (7), 374–382.
- [62] Price, C.J. and Devlin, J.T. (2011). The Interactive Account of ventral occipitotemporal contributions to reading. *Trends in Cognitive Sciences*, 15 (6), 246–253.
- [63] Woolnough, O., Donos, C., Rollo, P. S., Forseth, K.F., Lakretz, Y., Crone, N. E., Fischer-Baum, S., Dehaene, S., and Tandon, N. (2020). Spatiotemporal dynamics of orthographic and lexical processing in the ventral visual pathway. *Nature Human Behaviour*, <https://doi.org/10.1038/s41562-020-00982-w>
- [64] Potter, C.S. (2015) Using Phonically Based E-books to Develop Reading Fluency. In B. Gradinarova (Ed.), *E-Learning - Instructional Design, Organisational Strategy and Management*. Rijeka: InTech, DOI: 10.5772/61607. Available from: <http://www.intechopen.com/books/e-learning-instructional-design-organizational-strategy-and-management/using-phonically-based-e-books-to-develop-reading-fluency>
- [65] Martelli, M., Di Filippo, G., Spinelli, D., & Zoccolotti, P. (2009). *Crowding, reading, and developmental dyslexia*. *Journal of Vision*, 9, 4, article 14.
- [66] De Luca, M., Burani, C., Paizi, D., Spinelli, D. and Zoccolo, Z. (2010). *Letter and letter-string processing in developmental dyslexia*. *Cortex*, 46, 10, 1272–1283.
- [67] Di Filippo, G., Brizzolara, D., Chilosi, A., De Luca, M., Judica, A., Pecini, C., Spinelli, D. and Zoccolotti, P.

- (2006). *Naming speed and visual search deficits in readers with disabilities: Evidence from an orthographically regular language (Italian)*. *Developmental neuropsychology*, 30 (3), 885–904.
- [68] Spinelli, D., De Luca, M., Judica, A. and Zoccolotti, P. (2002). *Crowding effects on word identification in developmental dyslexia*. *Cortex*, 38 (2), 179–200.
- [69] Heckelman, R.G. (1969). A neurological-impress method of remedial-reading instruction. *Academic Therapy*, 4 (4), 277–282.
- [70] Samuels, S.J. (1979). *The method of repeated readings*. *The Reading Teacher*, 32 (4), 403–408.
- [71] Topping, K. (1995). *Paired, Reading, Spelling and Writing: The Handbook for Teachers and Parents*. London: Cassell.
- [72] Wolf, M., and Katzir-Cohen, T. (2001). Reading fluency and its intervention. *Scientific Studies of Reading*, 5 (3), 211–239.
- [73] Heckelman, R.G. (1962). *A neurological impress method of reading instruction*. RG Heckelman - 1962 - Merced CA: Merced County Schools Office.
- [74] Heckelman, R.G. (1969). A neurological-impress method of remedial-reading instruction. *Academic Therapy*, 4 (4), 277–282.
- [75] Heckelman, R. G. (1986). N.I.M. revisited. *Academic Therapy*, 21 (4), 411–420.
- [76] Stein, J. (2014). *Dyslexia: The role of vision and visual attention*. *Current Developmental Disorders Reports*, 1, 4, pages 267–280.
- [77] Stein, J., & Walsh, V. (1997). *To see but not to read; the magnocellular theory of dyslexia*. *Trends in Neurosciences*, 20, 4, pages 147–152.
- [78] Ehri, L. C. (2005). Learning to read words: Theory, findings and issues. *Scientific Studies of Reading*, 9, 167–188.
- [79] Ehri, L. (1979). Linguistic insight: Threshold of reading acquisition. In T. G. Waller & G.E. MacKinnon (Eds.), *Reading research: Advances in theory and practice* (Vol. 1, pp. 63–114). New York: Harcourt Brace.
- [80] Luria, A. R. (1966). *Higher cortical functions in man*. London: Tavistock Publications.
- [81] Luria, A.R. (1973). *The working brain: An introduction to neuropsychology*. Harmondsworth, Penguin Education.
- [82] Luria, A. R. (1976). *Basic problems of neurolinguistics* (Vol. 73). Berlin: Walter de Gruyter.
- [83] Dehaene, S., Pegado, F., Braga, L. W., Ventura, P., Filho, G.N., Jobert, A., Dehaene-Lambertz, G., Kolinsky, R., Morais, J. and Cohen, L. (2010). How Learning to Read Changes the Cortical Networks for Vision and Language. *Science*, 330, 1359-1364.
- [84] Dehaene, S. (2009). *Reading in the brain*. New York: Penguin Books.
- [85] Dehaene, S. (2020). *How we learn: why brains learn better than any machine... for now*. New York: Penguin Books.
- [86] Woolnough, O., Donos, C., Rollo, P. S., Forseth, K.F., Lakretz, Y., Crone, N. E., Fischer-Baum, S., Dehaene, S., and Tandon, N. (2020). Spatiotemporal dynamics of orthographic and lexical processing in the ventral visual pathway. *Nature Human Behaviour*, <https://doi.org/10.1038/s41562-020-00982-w>
- [87] Bowers, P. G., Sunseth, K., & Golden, J. (1999). The route between rapid naming and reading progress. *Scientific Studies of Reading*, 3, 31–53.

- [88] Van der Stappen, C. & Van Reybroeck, M. (2018). Phonological Awareness and Rapid Automatized Naming Are Independent Phonological Competencies With Specific Impacts on Word Reading and Spelling: An Intervention Study. *Frontiers in Psychology*, 9, 320.
- [89] Bowers, P. G., & Wolf, M. (1993). Theoretical links between naming speed, precise timing mechanisms and orthographic skill in dyslexia. *Reading and Writing: An Interdisciplinary Journal*, 5, 69–85.
- [90] Norton, E.S. and Wolf, M. (2012). Rapid Automatized Naming (RAN) and Reading Fluency: Implications for Understanding and Treatment of Reading Disabilities. *Annual Review of Psychology*, 63 (1), 427–452.
- [91] Wolf, M. and Bowers, P. G. (1999). The double-deficit hypothesis for the developmental dyslexias. *Journal of Educational Psychology*, 91 (3), 415–438.
- [92] Wolf, M., Bowers, P.G. & Biddle, K. (2000). Naming-Speed Processes, Timing, and Reading: A Conceptual Review, *Journal of Learning Disabilities*, 33 (4), 387–407.
- [93] Nicolson, R. I., Fawcett, A. J., and Baddeley, A. D. (1992). Working memory and dyslexia. Sheffield UK: University of Sheffield, Department of Psychology, Report LRG, 3/91.
- [94] Woolnough, O., Donos, C., Rollo, P. S., Forseth, K.F., Lakretz, Y., Crone, N. E., Fischer-Baum, S., Dehaene, S., and Tandon, N. (2020). Spatiotemporal dynamics of orthographic and lexical processing in the ventral visual pathway. *Nature Human Behaviour*, <https://doi.org/10.1038/s41562-020-00982-w>
- [95] Hannagan, T., Amedi, A., Cohen, L., Dehaene-Lambertz, G. and Dehaene, S. (2015). Origins of the specialisation for letters and numbers in ventral occipitotemporal cortex. *Trends in Cognitive Sciences*, 19 (7), 374–382.
- [96] Luria, A. R. (1966). *Higher cortical functions in man*. London: Tavistock Publications, pp. 36–37.
- [97] Luria, A.R. (1973). *The working brain: An introduction to neuropsychology*. Harmondsworth, Penguin Education, p. 32.
- [98] Luria, A. R., Simernitskaya, E. G., and Tubylevich, B. (1970). The structure of psychological processes in relation to cerebral organisation. *Neuropsychologia*, 8 (1), 13–19.
- [99] Vygotsky, L. S. (1960). Razvitie vysshikh psikhicheskikh funktsii [Development of the Higher Mental Functions]. Moscow: Publishing House of the R.S.F.S.R. Academy of Pedagogical Sciences, pp. 13–223.
- [100] Rossouw, P. and Kostyanaya, M. (2013). Alexander Luria: Life, research and contribution to neuroscience. *International Journal of Neuropsychotherapy*, 1 (2), 47–55.
- [101] Luria, A.R. (1973). *The working brain: An introduction to neuropsychology*. Harmondsworth, Penguin Education, p. 32.
- [102] Potter, C.S. (2020). *Introducing the Foundation Level Activity Books Using the Structured Language Experience Approach: A Parent Implementer's Manual*. Electronic copy available from my practice by emailing me at [pottercs@gmail.com](mailto:pottercs@gmail.com)
- [103] Frith, U. (1985). Beneath the surface of developmental dyslexia. *Surface Dyslexia*, 32, 301–330.
- [104] Berninger, V. W., Abbott, R. D., Abbott, S. P., Graham, S., and Richards, T. (2002). Writing and reading:



Connections between language by hand and language by eye. *Journal of Learning Disabilities*, 35 (1), 39–56.

[105] Ehri, L. C. (2005). Learning to read words: Theory, findings and issues. *Scientific Studies of Reading*, 9, 167–188.

[106] Ehri, L. C., and McCormick, S. (1998). Phases of word learning: Implications for instruction with delayed and disabled readers. *Reading and Writing Quarterly: Overcoming Learning Difficulties*, 14 (2), 135–163.

[107] Ehri, L. (1979). Linguistic insight: Threshold of reading acquisition. In T. G. Waller & G.E. MacKinnon (Eds.), *Reading research: Advances in theory and practice* (Vol. 1, pp. 63–114). New York: Harcourt Brace.

[108] Ehri, L. C. (1997). Learning to read and learning to spell are one and the same, almost. In C. A. Perfetti, L. Rieben and M. Fayol (Eds), *Learning to spell: Research, theory, and practice across languages*. Hillsdale, NJ: Erlbaum, pp. 237–269.

[109] Moats, L.C. (2005). How spelling supports reading: And why it is more regular and predictable than you may think. *American Educator*, 6 (12–22), 12–43.

[110] Moats, L. (2009). Knowledge foundations for teaching reading and spelling. *Reading and Writing* 22, 379–399.

[111] Potter, C.S. (2018). *Introducing the Seven Vowel Phonic Analysis System: A Manual for Parent Implementers*. Electronic copy available from my practice by emailing me at pottercs@gmail.com

[112] Ellis, N.C. and Hooper, A.M. (2001). Why learning to read is easier in Welsh than in English: Orthographic transparency effects evinced with frequency-matched tests. *Applied Psycholinguistics*, 22, 571–599.

[113] Spencer, L. H., and Hanley, J. R. (2003). Effects of orthographic transparency on reading and phoneme awareness in children learning to read in Wales. *British Journal of Psychology*, 94 (1), 1–28.

[114] Moats, L.C. (2005). How spelling supports reading: And why it is more regular and predictable than you may think. *American Educator*, 6 (12–22), 12–43.

[115] Moats, L. (2009). Knowledge foundations for teaching reading and spelling. *Reading and Writing* 22, 379–399.

[116] Oaks, R.E. (1981). A study of the vowel situation in a primary vocabulary. *Spelling Progress Bulletin*, Summer, 6–12.

[117] Luria, A. R. (1966). *Higher cortical functions in man*. London: Tavistock Publications.

[118] Luria, A.R. (1973). *The working brain: An introduction to neuropsychology*. Harmondsworth, Penguin Education.

[119] Luria, A. R. (1976). *Basic problems of neurolinguistics* (Vol. 73). Berlin: Walter de Gruyter.

[120] Perfetti, C. A., and Dunlap, S. (2008). Learning to read: General principles and writing system variations. *Learning to Read across Languages*, 13–38.

[121] Perfetti, C.A and Zhang, S. (1995). Very early phonological activation in Chinese reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 21 (1), 24–33.

[122] Perfetti, C.A., Zhang, S. and Berent, I. (1992). Reading in English and Chinese: Evidence for a “Universal” Phonological Principle. *Advances in Psychology*, 94, 227–248.

[123] McCutchen D. (1988). “Functional Automaticity” in Children’s Writing: A



Problem of Metacognitive Control.  
*Written Communication*, 5 (3), 306–324.

[124] Potter, C.S. (2017b). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part Two: Programme Methods and Materials. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <http://www.intechopen.com/articles/show/title/developing-automaticity-in-children-with-learning-disabilities-a-functional-perspective-part-two-pro>

[125] Potter, C.S. (2020) (a). Introducing the Targeted Analysis, Revisualisation and Sequential Spelling Programme: A Manual for Parent Implementers. Electronic copy available from my practice by emailing me at [pottercs@gmail.com](mailto:pottercs@gmail.com)

[126] Perfetti, C.A and Zhang, S. (1995). Very early phonological activation in Chinese reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 21 (1), 24–33.

[127] Perfetti, C.A., Zhang, S. and Berent, I. (1992). Reading in English and Chinese: Evidence for a “Universal” Phonological Principle. *Advances in Psychology*, 94, 227–248.

[128] Berninger, V. W., Abbott, R. D., Abbott, S. P., Graham, S., and Richards, T. (2002). Writing and reading: Connections between language by hand and language by eye. *Journal of Learning Disabilities*, 35 (1), 39–56.

[129] Berninger, V.W., Abbott, R.D., Nagy, W. and Carlisle, J. (2010). Growth in Phonological, Orthographic, and Morphological Awareness in Grades 1 to 6. *Journal of Psycholinguistic Research*, 39, 141–163.

[130] Perfetti, C.A., Zhang, S. and Berent, I. (1992). Reading in English and Chinese: Evidence for a “Universal” Phonological Principle. *Advances in Psychology*, 94, 227–248.

[131] McCutchen D. (1988). “Functional Automaticity” in Children’s Writing: A Problem of Metacognitive Control. *Written Communication*, 5 (3), 306–324.

[132] Potter, C.S. (2015) Using Phonically Based E-books to Develop Reading Fluency. In B. Gradinarova (Ed.), *E-Learning - Instructional Design, Organisational Strategy and Management*. Rijeka: InTech, DOI: 10.5772/61607. Available from: <http://www.intechopen.com/books/e-learning-instructional-design-organizational-strategy-and-management/using-phonically-based-e-books-to-develop-reading-fluency>

[133] Potter, C.S. (2017a). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part One: Theory and Assessment. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <https://www.intechopen.com/books/learning-disabilities-an-international-perspective/developing-automaticity-in-children-with-learning-disabilities-a-functional-perspective-part-one-the>

[134] Potter, C.S. (2017b). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part Two: Programme Methods and Materials. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <http://www.intechopen.com/articles/show/title/developing-automaticity-in-children-with-learning-disabilities-a-functional-perspective-part-two-pro>

[135] Potter, C.S. (2019). Training Reading, Writing and Spelling Fluency: Centre-Periphery Dissemination through Interactive Multimedia. In D. Cvetkovic (Ed.), *Interactive Multimedia - Multimedia Production and Digital Storytelling*. IntechOpen, DOI: 10.5772/intechopen.82812. Available from: <https://www.intechopen.com/books/interactive-multimedia-multimedia-production-and-digital-storytelling/training-reading-writing-and-spelling>

fluency-centre-periphery-dissemination-through-interactive-mul

[136] Jorm, A., and Share, D. (1983). Phonological recoding and reading acquisition. *Applied Psycholinguistics*, 4, 103–147.

[137] Jorm, A., Share, D., Maclean, R., and Matthews, R. (1984). Phonological recoding skills and learning to read: A longitudinal study. *Applied Psycholinguistics*, 5, 201–207.

[138] Share, D. L. (1995). Phonological recoding and self-teaching: Sine qua non of reading acquisition. *Cognition*, 55 (2), 151–218.

[139] Share, D. L. (1999). Phonological recoding and orthographic learning: A direct test of the self-teaching hypothesis. *Journal of Experimental Child Psychology*, 72 (2), 95–129.

[140] Share, D. L. (2004). Orthographic learning at a glance: On the time course and developmental onset of self-teaching. *Journal of Experimental Child Psychology*, 87(4), 267–298.

[141] Potter, C.S. (2015) Using Phonically Based E-books to Develop Reading Fluency. In B. Gradinarova (Ed.), *E-Learning - Instructional Design, Organisational Strategy and Management*. Rijeka: InTech, DOI: 10.5772/61607. Available from: <http://www.intechopen.com/books/e-learning-instructional-design-organizational-strategy-and-management/using-phonically-based-e-books-to-develop-reading-fluency>

[142] Potter, C.S. (2017a). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part One: Theory and Assessment. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <https://www.intechopen.com/books/learning-disabilities-an-international-perspective/developing-automaticity-in-children->

with-learning-disabilities-a-functional-perspective-part-one-the

[143] Potter, C.S. (2017b). Developing Automaticity in Children with Learning Disabilities: A Functional Perspective Part Two: Programme Methods and Materials. In C. Ryan (Ed.). *Learning Disabilities*. London: InTech, Available from: <http://www.intechopen.com/articles/show/title/developing-automaticity-in-children-with-learning-disabilities-a-functional-perspective-part-two-pro>

[144] Potter, C.S. (2019). Training Reading, Writing and Spelling Fluency: Centre-Periphery Dissemination through Interactive Multimedia. In D. Cvetkovic (Ed.), *Interactive Multimedia - Multimedia Production and Digital Storytelling*. IntechOpen, DOI: 10.5772/intechopen.82812. Available from: <https://www.intechopen.com/books/interactive-multimedia-multimedia-production-and-digital-storytelling/training-reading-writing-and-spelling-fluency-centre-periphery-dissemination-through-interactive-mul>