Incorporating Multi-sensory Approach into Focused Word Recognition Method to Teach Children with Learning Difficulties in Hong Kong

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Abstract

The traditional word identification method in Chinese focuses very much on rote memorization of reading and writing of characters. Children with dyslexia who have short attention span may not be effectively motivated by this method to learn Chinese characters. This study aims at investigating the effectiveness of incorporating multi-sensory as well as computer assisted learning techniques into “Focused Word Recognition Method” to teach children with dyslexia the accuracy of reading and writing in Chinese. The training was conducted to a group of Primary 2 children with dyslexia in ten training sessions from January 2003 to March 2003. Results of the pre- and post-tests showed that the participants obtained significant improvement in the accuracy of writing and reading of Chinese characters.

In alphabetic writing systems, the most distinguishing characteristics of children with dyslexia in reading appear to be phonological processing deficits, especially evident on measures of phonological awareness (Wolf & Bowers, 1999). Phonological awareness is one's explicit awareness of the phonological structure of the words in one's language. It is mainly to discover correspondence between graphemes and phonemes that requires the ability to decompose words into their phonemic elements. Examples of phonological awareness include segmentation of words and pronounceable non-words into phonemic segments, phoneme blending, phoneme deletion and phoneme substitution (Torgensen, Wagner & Rashotte, 1994).

Interventions that included instruction in an alphabetic code-based approach to reading words showed strong effects with children with difficulty in reading (Foorman, Francis, Fletcher, Shatschneider & Mehta, 1998; Torgesen, Wagner, Rashotte, Rose, Lindamood, Conwa & Garvin, 1999). It is suggested that the first priority in beginning reading instruction be placed on phonological awareness (National Reading Panel, 2000).

In the case of designing instructional programmes for children with dyslexia in Chinese language, the view is somewhat different from that of alphabetic writing systems. This is due to the fact that the orthographic structure of Chinese character is very complex and it is difficult to learn. Although the Chinese writing system consists of eight basic strokes, the number of strokes in one character ranges from one to more than twenty. The compositionality of Chinese can be summarized in 12 different ways (see Tse, 2002). Each character consists of a semantic radical and this part gives the hinting for meaning. Phonetic radicals also exist in some Chinese characters and they provide clues for pronunciation. For example, is arranged in a “AB” format. Component “A” is the semantic radical which dictates the meaning whereas component “B” is the phonetic radical and it dictates the sound. Children with dyslexia often find difficulties in recognizing the internal composition of Chinese characters.
Ho, Wong and Chan (1999) and Li and Chen (1999) suggested that the nature of orthographic units is important for reading and spelling the Chinese characters. Leong, Cheng and Lam (2000) found that training in the recognition of the functions of semantic and phonetic radicals improved the performance of children with dyslexia in learning to read and spell Chinese characters.

Chan and Nunes (1998) and Shu and Anderson (1999) maintained that by the 3rd and 4th grades, children have already understood the composition of Chinese characters. Children are able to make use of the functions of phonetic and semantic radicals for predicting the meaning and sound of characters. Considering the need to understand the specific graphic features of Chinese language, a structured program for the awareness of the phonetic as well as the semantic components of the characters is important for students to learn to read and write in Chinese language. In teaching children to read, schools in mainland China have practiced the use of “Focused Word Recognition Method” since late 50’s. “Focused Word Recognition Method” is considered as a structured and systematic kind of instruction for children. Chinese characters are grouped under the same category of phonological, orthographic or semantic features for teaching.

For example, characters with semantic radical such as can be introduced to the children as a cohort for intensive training. Another group of characters with new semantic radical may later be taught to the children after they have tackled the previous task. Characters can also be grouped based on the pronunciations. For example, characters with phonetic radical such as can be used for teaching the children with particular difficulty in reading.

In addition, evidence shows that intervention strategies for teaching reading and spelling skills to children with dyslexia should be multi-sensory. Multi-sensory techniques are those which use more than one sensory channel for input of information. It has long been agreed that such a method is invaluable in the teaching of students with dyslexia. The stronger channel is used to support the weaker, while the weaker channel is being trained and developed. The elements of all the modalities, i.e., visual, auditory, kinesthetic and tactile are incorporated in the teaching of children with dyslexia. It is believed that this type of teaching benefit in most classes.

An example of using multi-sensory approach to teach children to read Chinese is the technique of simultaneous oral character writing. The student first follows the teacher to say the character. He then follows teacher to read aloud each stroke of the character. The following step is to write the character and say the character again. Later the teacher reads the sequence of strokes and he writes the character again.

There is evidence that using computer-based programmes as study tools improves the test performance of students with learning disabilities (Anderson-Inman, Knox-Quinn & Horney, 1996). For example, hypermedia is one such innovation that has been developed within the last 15 years. Hypermedia involves the use of computer software to enhance text through making connections between the text, such as definitions of particular words, identification of topic sentences, connections between prepositions and direct objects, or pronoun clarifications (MacArthur & Haynes, 1995).
In order to enhance the effectiveness of “Focused Word Recognition Method”, this study tried to incorporate the techniques of multi-sensory and computer assisted learning into the teaching program for children with dyslexia. It is hoped that the proposed teaching programme can alleviate the problems faced by the children in their reading and writing.

Method

Participants

Participants were 6 Primary 2 students of Intensive Remedial Teaching Programme (IRTP). In general, students who were eligible for entering the IRTP had deficits in two or more of the three basic subjects, i.e. Chinese, English and Mathematics. Participants of this study were reported by their subject teachers or the educational psychologists that they were dyslexic cases.

Stimulus Materials

A number of 40 characters of levels 2 & 3 were selected from the CD of the teaching package: Dyslexia: Awareness and Teaching (Ho, 2003) for training. The list of characters was shown in Figure 1.

Stimulus materials

Figure 1: List of Stimulus Materials

<table>
<thead>
<tr>
<th>Training Session 1</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Training Session 2</td>
<td></td>
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<tr>
<td>Training Session 3</td>
<td></td>
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<tr>
<td>Training Session 4</td>
<td></td>
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<tr>
<td>Training Session 5</td>
<td></td>
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</tbody>
</table>

The characters were divided into 5 groups. Each group consists of 8 characters. A session of 45 minutes was used to teach each group of characters. Students were assessed at the end of each teaching session. Reading aloud test was conducted individually and the writing test was conducted in groups.

Pre-test

Students were individually asked to read aloud the characters in Figure 1. The characters were individually written in flash cards. Then, the investigator read aloud these characters to the students in groups. Students were required to write down every character that the teacher read aloud in front of them.
Procedure

A number of 40 characters were used for instruction. The procedure is described as below:

1. Teacher used the CD to show the targeted character to the participants. Participants were requested to listen carefully to the story of the targeted character.
2. Teacher showed the character again to the students. The silent version of the CD was used. Only pictures were shown. Participants were asked to repeat the story of each character.
3. Teacher gave the word cards to participants. Participants were asked to trace the character with their fingers on the word cards while listening to the story.
4. Participants were asked to repeat the story orally while tracing the character with fingers.
5. Participants were asked to listen to the instruction from the teacher and write down the targeted character on a piece of white paper.

Criteria for assessment

Correct responses:
- Correct responses in Dictation and Reading-aloud.

Incorrect responses:
- Dictation
  - Visual errors: wrong strokes
  - Phonological errors: homophone confusion
  - Semantic errors: replacement with another character with the same meaning or category.
  - No responses
- Reading-aloud
  - Visual errors: confusion with other characters with similar or near similar graphic features
  - Phonological errors: homophone confusion
  - Semantic errors: confusion with other character with the similar or near meaning or category.
  - No responses

Result

Table 1: Means of the Number of Responses in Dictation

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct responses</td>
<td>9.17</td>
<td>36.67</td>
</tr>
</tbody>
</table>
There is a significant improvement of participants in the performance of the dictation activity. In the pre-test, the children made 9.17 mean correct responses. The multi-sensory training programme, which emphasized the recognition of internal graphic structure of the characters, increased the mean correct responses to 36.67. This result suggested that the multi-sensory method was effective for teaching children with dyslexia to dictate Chinese characters. Another significant result is that the participants made no semantic errors after the training. In the pre-test, participants made errors, like as as as as or as . This is due to the fact that participants were asked to repeat the story of each character and tell the investigator orally about the make-up of the story. The over-learning of the stories of the characters is useful to participants to memorize the detailed components of the characters. It is not a surprising result that they made fewer semantic errors in this study.

Table 2: Mean of the Number of Responses in Reading-Aloud

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct responses</td>
<td>19.16</td>
<td>35.67</td>
</tr>
<tr>
<td>No responses or irrelevant responses</td>
<td>14.33</td>
<td>2.67</td>
</tr>
<tr>
<td>Orthographic errors</td>
<td>2.33</td>
<td>0.17</td>
</tr>
<tr>
<td>Phonological errors</td>
<td>1.50</td>
<td>1.00</td>
</tr>
<tr>
<td>Semantic errors</td>
<td>2.67</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Performance in reading-aloud improved significantly as well. The comparison of pre- and post-tests showed that the mean number of correct responses increased from 19.16 to 35.67. The error analysis showed that participants made much fewer orthographic and semantic errors in the post-test. The training focused on the analysis of the internal components of the target characters also assisted children to perform much better in their reading–aloud activities.

Results of this study indicated that techniques of multi-sensory and computer-assisted learning as well as the awareness of the composition of Chinese characters can assist children with dyslexia to read and write more effectively. In fact, over-learning is also important for students with dyslexia to learn to read and write. Children in this study benefited from using the silent version of the CD to repeat the story of the character orally. It is hoped that this study would give some hints for teachers to design their teaching programmes for children with problems in reading and writing.

References


