

**EFFECTIVE SPELLING STRATEGIES FOR STUDENTS WITH DYSLEXIA IN HONG KONG  
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*This study examines the effectiveness of five spelling strategies used to teach junior secondary school students with dyslexia. Participants were 30 secondary school teachers in Hong Kong. The teachers commented on five spelling strategies: the phonological strategy, an integration of phonological and orthographical strategies, the rule-based strategy, the visual-imagery strategy and teaching spelling with other skills. The study compared teachers' opinions and suggestions given in the literature. Results indicated that the five strategies have both strengths and weaknesses. The strategies are complementary; therefore, integration is suggested. Implications are discussed in the context of spelling strategies and measures of teaching junior students with dyslexia.*

Traditionally, children with special needs such as learning difficulties were often seen as a group of *disabled students* who needed to be catered for separately in order to learn (Crawford, 1998; Mitchell & Chen, 1996; Zhang, 2010). However, since the formulation of the Code of Practice on Education by the Equal Opportunities Commission in 2001, students with special learning needs have had the same opportunities as their average counterparts to receive non-discriminative normal education in mainstream schools (Cheung & Hui, 2007; Sin, 2001; Yuen & Westwood, 2001). An important implication of this formulation is that teachers now face the challenge of handling students with mixed abilities in a class. As a result, not only have extra strategies been implemented aimed at helping students with special educational needs in school, but also, the Education Bureau has provided courses on special educational needs for teachers in general and special schools.

Dyslexia is one of the most common learning difficulties found among Hong Kong students. According to the Jockey Club in Hong Kong (2006), dyslexia accounts for over 80% of specific learning difficulties cases. The general symptoms of dyslexia include difficulties regarding motor or perceptual skills, language skills, early literacy or pre-reading skills, reading skills and writing skills (Rief & Stern, 2010). Davis and Braun (2010) pointed out that it is difficult to define the symptoms of dyslexia since those with dyslexia do not have exactly the same set of symptoms. Although there are different points of view concerning the symptoms of dyslexia, it has been shown that one thing that learners with dyslexia have in common is problems in spelling. Such problems in spelling always receive attention because they are often persistent and may affect learners for a long time. The problems worsen if learners are not taught how to improve their spelling techniques as the gap between their reading and spelling abilities increases with age (Bruck, 1990; Høien & Lundberg, 2000). The International Dyslexia Association (2008) outlined the drawbacks and difficulties with spelling of learners with dyslexia: (a) individuals with dyslexia have conspicuous problems with spelling and writing, in spite of being capable in other areas and having a normal amount of classroom instruction and (b) though many individuals with dyslexia learn to read fairly well, difficulties with spelling (and handwriting) tend to persist throughout life, requiring instruction, accommodations, task modifications, and understanding from those who teach or work with the individual.

Spelling is a very complex process as it includes many sub-processes, involving phonological,

morphological, semantic and orthographic skills (Hoiem & Lundberg, 2000). Generally, for many learners who learn English as their second language, learning to spell is systematic. Many students can learn to spell through repeated practice, dictation, oral practice and recitation. Nevertheless, learners with dyslexia often need special instruction and training in learning to spell as they may have difficulties in using sound-letter correspondence rules in spelling correctly when compared to young adults without disabilities (Horn, Leicht, & O'Donnell, 1988). Since traditional teaching approaches are not suitable and sufficient there should be more tailor-made and effective strategies for teaching children with dyslexia.

#### *Literature review*

Over the past decades, a great deal of research has been completed for spelling deficiencies of learners with dyslexia. Different researchers have recommended different strategies. The most common suggestion for teaching children with dyslexia how to spell is to teach step-by-step. Many frameworks have been developed with reference to this strategy. Amtmann and Berninger (2003) recommended systematic and structured learning steps. In their intervention study, they categorized the spelling problems into several types in order to raise students' phonological awareness, to teach the rules and principles in English and to implement repeated practice. In another study, Mercer and Mercer (2005) divided the words into nine competencies, and they also stated the reasons why the words were categorized in this way and suggested the sequence of teaching these English words. According to the International Dyslexia Association (2008), there are, in general, three types of words: phonological, orthographic and morphological. However, teaching spelling should not only be based on these three categories. Following, the most commonly used strategies will be discussed. The strategies that have been suggested by different researchers are: (1) the phonological strategy (Berninger & Amtmann, 2003; Nunes & Bryant, 2009; Swerling, 2005), (2) an integration of phonological and orthographical strategies (Berninger & Amtmann, 2003; Pressley, 1999; Swerling, 2005), (3) the rule-based strategy (Darch & Simpson, 1990; Moats, 2005), (4) the visual-imagery strategy (Sears & Johnson, 1986), and (5) teaching spelling with other skills (Berninger & Amtmann, 2003; Berninger, Vaughan, Abbott, Begay, Byrd, Curtin, Minnich & Graham, 2002; Swerling, 2005).

#### *Phonological Strategy*

Some researchers have pointed out that having problems with phonological awareness may be one of the challenges that face children with dyslexia (Martin, Pratt, & Fraser, 2000). Therefore, it is recommended by some that the phonological strategy (teaching phonological relationships) is the most effective method in raising dyslexic students' phonological awareness so as to improve spelling (e.g., Martin, Pratt, & Fraser, 2000). The phonological relationships of words refer to the relationships between the pronunciation and the letters in spelling English words. There have been numerous studies emphasizing the importance of phonological knowledge development in helping learners develop their spelling skills (e. g., Berninger & Amtmann, 2003; Nunes & Bryant, 2009; Swerling, 2005; The International Dyslexia Association, 2008). In some cases, knowledge of phonological relationships is thought to be the most important type of knowledge, and should even be taught first in spelling lessons. The International Dyslexia Association (2008) maintained that students should learn how to pronounce the target word before trying to link the sound and letters and before learning the morphological features of the target word. It has also been suggested that knowledge of letter-sound relationship is the most basic kind of knowledge required for good English spelling (Swerling, 2005). However, some researchers (e. g., Sears & Johnson, 1986) have maintained that the auditory strategy (which focuses on syllabication and pronunciation) is the least useful method as poor spellers tended to be bound by rules of letter-sound relationships. Therefore, these researchers do not suggest using the auditory strategy to teach spelling as the pronunciation and syllabication might confuse learners.

#### *An integration of Phonological and Orthographic Strategies*

At the same time, many authors have confirmed the importance of using phonological and orthographic strategies together (Berninger & Amtmann, 2003; Pressley, 1999; Swerling, 2005). While the phonological strategy aims to teach the letter-sound relationships, the orthographic strategy refers to the method of accessing words' specific orthographic patterns accurately and quickly (Klein & McMullen, 1999). According to Hoiem and Lundberg (2000), the orthographic strategy allows the reader to go directly from the word's orthographic representation to the word's sound and meaning. In other words, orthographic representation is an abstract image of how the word is spelled.

When the orthographic strategy is applied, students are taught to distinguish between a word and a homophonic non-word, and between two homonyms when the context is given. Martin, Pratt and Fraser

(2000) conducted a study on whether phonological and orthographic strategies should be used with particular age groups, and they confirmed that there was a need to use both phonological and orthographic strategies together because alphabetic orthography is necessary to the development of phonemic awareness, regardless the age and the level of the learners (Martin, Pratt, & Fraser, 2000). Although Pressley (1999) pointed out that the use of the orthographic strategy probably depended on phonological decoding skills, Martin and colleagues confirmed the value of using both strategies. Therefore, it was suggested in Martin, et al.' study (2000) that phonological and orthographic strategies should be adopted together in order to teach students decoding and spelling providing a balance between both decoding methods to prevent students from over-relying on orthographic coding which is suggested to be a coding strategy.

#### *The Rule-based Strategy*

The rule-based strategy focuses on teaching the rules of English words. Some educators believe that this is the most effective method to teach learners with dyslexia to spell (e.g., Darch & Simpson, 1990; Moats, 2005). Some also maintain that the formation of rules in English is essential as there are various rules in spelling English words, such as inflectional and derivational morphemes, word structures and the features of prefixes and suffixes (e.g., O'Dwyer, 2006; Moats, 2005). Høien and Lundberg (2000) and Swerling (2005) stressed the importance of teaching morphological and grammatical knowledge about words. Nunes and Bryant (2009) emphasized the importance of teaching morphemes and suggested that teaching inflectional and derivational morphemes could help learners develop a systematic and structured spelling method. Similarly, Madshid (2008) in examining the influence of the first language on the second language (which was English), pointed out that the morphological strategy was the most useful method in training learners to spell as it addressed the difference between the learner's first and second language and the importance of morphological features of English. Darch, Kim, Johnson and James (2000) compared the rule-based strategy with the traditional spelling strategy and suggested that the rule-based strategy was the most effective when it was used with elementary students, while for other students, the rule-based strategy was in fact ineffective.

#### *The Visual Imagery Strategy*

Some researchers (Sears & Johnson, 1986; van Hell, Bosman & Bartelings, 2003) maintain that the visual imagery strategy is very effective in teaching students to spell. The visual imagery strategy uses visual images of words to aid memory. For example, the target word *run* is shown on the screen or through other methods, and students are asked to look at the word. After several seconds, the word will be covered and students try to write down what they have seen. The process is repeated until the learners are able to spell the word correctly. There have been some studies aimed at testing the effectiveness of this strategy. Sears and Johnson (1986) constructed a framework for visual imagery strategy in spelling and found that visual imagery methods were associated with better performance than auditory imagery (which focused on pronunciation) because spelling was a visual and individual activity. However, researchers such as Darch and Simpson (1990), who disagreed with this belief, emphasized that the visual imagery strategy was less effective based on the evidence of data collected from their research. They stated that the ineffectiveness of the strategy might have been due to the fact that it was not clear whether students were using the target strategy when they spelt the words.

#### *Teaching Spelling with Other Skills*

While some researchers believe that spelling should be taught individually, some suggest that it is more appropriate to teach spelling through reading or writing. Berninger and Amtmann (2003) illustrated four treatments (spelling only training, genre-specific essay composing training, combined spelling and essay composing training, and a contact control of keyboard training without explicit writing instruction) in training students with dyslexia to spell and to write. They discovered that *only the combined treatments of spelling and essay writing improved both spelling and composing skills* (Berninger & Amtmann, 2003; Berninger et al., 2002), while spelling only training enabled students to spell better in compositions.

In addition, some studies have indicated the dependent relationship between spelling and reading. Swerling (2005) pointed out that reading could promote spelling knowledge. He also encouraged independent reading to increase exposure to printed words and to help to promote spelling knowledge. Undoubtedly, learning to spell can have a positive effect on learning to read and write (Berninger & Amtmann, 2003; Høien & Lundberg, 2000; Mercer & Mercer, 2005; Moats, 2005) as students are able to understand the words in text if they can spell them. Also, if they know how to link the words with the sounds, they are able to understand the single words in order to understand the whole text. For learners with dyslexia, more explicit instruction and training is needed compared to their typical counterparts;

therefore, even if spelling is taught through reading or writing tasks, they still need separate and distinct instructions and guidelines in learning to spell.

In all, the above literature review includes comments on strategies such as the phonological spelling strategy, which focuses on teaching the phonological relationships between the pronunciations and the letters; an integration of phonological and orthographic strategies, which focuses on the sound-letter relationships and also the patterns of words; the rule-based strategy, which focuses on teaching the grammatical and morphological rules of English words; the visual imagery strategy, which emphasizes the visual treatment in memorizing the spelling of the words; and teaching spelling with associated skills such as reading and writing. Although there are sufficient references in the literature to spelling strategies used to teach students with dyslexia, all of these are based on Western contexts, where the target learners learn English as their first language. Therefore, this study focuses on giving an overview of the spelling strategies that the teachers in this study believed to be effective for secondary students with dyslexia who are learning English as a second language in Hong Kong.

### **Methodology**

A qualitative study has the potential to return rich information. Qualitative research also can approach a topic with open-ended questions and potentially discover variables that can later be studied quantitatively (McCracken, 1988). Therefore, a qualitative research approach was chosen for this study.

This study involved 30 secondary teachers in Hong Kong. We attempted to investigate the effectiveness of spelling strategies used by teachers to teach junior secondary school students with dyslexia. The rationale was to discover whether the current situation in Hong Kong concerning teaching spelling to students with dyslexia is consistent with the situation and spelling strategies suggested by the literature. In this study, a total of 30 teachers were interviewed and asked to fill in a questionnaire developed by the authors. To test the content and concurrent validities of the questions, three teachers (who later did not participate in the main study) were asked to review and give suggestions for improving the pretest form of the questionnaire. Questions were then revised and retested until they were understood accurately by all of the pretest participants. Finally, the revised questionnaire was sent to two professionals for further review and refinement.

The main purpose of the interviews and questionnaire was to obtain detailed information about commonly used spelling strategies. Also, they were asked to comment on the spelling strategies suggested in the literature. All participants were experienced teachers of children with dyslexia in Hong Kong secondary schools. About 90% (26) of the teachers were aged from 25 to 50, experienced in teaching in mainstream secondary schools in Hong Kong and familiar with the special needs of children with dyslexia. Prior to the study, information regarding the purpose and nature of the study was disseminated among the teachers, and the issue of confidentiality was emphasized with all participants. In this paper, pseudonyms are used to protect the teachers' privacy.

The questions set the direction of this study:

1. What are the common spelling mistakes made by junior secondary students with dyslexia?
2. What are the teachers' opinions about the five selected spelling strategies (most commonly used strategies as indicated in the literature)?
3. How can the strategies recommended by the researchers be used to help junior secondary school students with dyslexia to spell?

### **Findings and Discussion**

Data gathered from the interviews were first transcribed to printed documents for more in-depth analysis. These data were combined with the data gathered through the questionnaires. Both sets of data were analyzed using coding analysis of similar comments to facilitate the grouping of like-responses. A process of data reduction, data display, and data analysis was used (Miles & Huberman, 1984).

#### *Questions One and Two: Results Determined by the Structured Interviews*

##### *The common spelling mistakes made by junior secondary students with dyslexia*

According to the results of the interviews, the teachers suggested some common spelling mistakes made by junior secondary students with dyslexia. These include:

- (1) mirror image such as *doy* for *boy*, *giq* for *pig*
- (2) omission of letters such as *bals* for *balls*
- (3) misspelling of vowel clusters such as *dit* for *diet*

(4) reversion of letters such as *sarcf* for *scarf*

Although only four types are mentioned above, there are more, which cannot be categorized. In other words, the mistakes made by the spellers with dyslexia are spontaneous. This reflects that students may have deficiencies in identifying phonological relationships. Also, they are confused about letters. The vowel clusters and letters which are not pronounced are difficult for students because they do not know how to spell the words when they hear the pronunciation. Some teachers pointed out that students with dyslexia do not make consistent mistakes. Therefore, teaching them spelling requires sufficient time and effective spelling strategies.

A majority of the teachers (75%) interviewed pointed out that students with dyslexia often have learning problems in both their native language and the second language. Therefore, students with dyslexia in Hong Kong often have problems in reading articles or identifying words in both Chinese and English. As a result, they need extra help in both aspects, and they may, in turn, become frustrated with all the knowledge that they need to learn. Most teachers (83%) advised dividing the target topics into smaller steps for ease of following and avoiding confusion.

*Teachers' opinions on the spelling strategies*

About 60% of the participants believed that it was most essential to raise students' phonological awareness and that the phonological strategy was the most effective strategy in teaching students with dyslexia how to spell. For these teachers, therefore, teaching students with dyslexia the phonological relationships between letters and sounds was of the highest priority. Two teachers (about 7%) addressed the importance of noting the learners' weaknesses in learning phonological relationships because these may be very difficult for young learners. If the target learners are more mature, however, it may be easier for them to learn the relationships and use them when they come across some new vocabulary. Also, one teacher, Miss Cheng, who had been teaching students with dyslexia for more than ten years in a Chinese as the Medium Instruction (CMI) secondary school, pointed out that it was vital for students to learn through the phonological strategy because English was very different from their first language—Chinese. In addition, the phonological strategy provides students with the foundation to *tackle* a new word. Mr. Chan, a teacher with three years' teaching experience in a CMI school, pointed out the importance of mentioning phonological relationships explicitly to learners with dyslexia because of their inability to relate sounds to letters.

Regarding the phonological strategy, 18 teachers (60%) suggested teaching regular words before irregular ones. However, they had different opinions about whether to teach students vowels before consonants in the early stages. About 23% stressed the importance of raising students' phonological awareness and suggested that teachers should teach students vowels first because of the importance of vowels in English. They might pick a certain vowel to focus on in each lesson so that students would have enough practice in using the target vowel. However, about 37% pointed out that students may find learning vowels very difficult as vowels are complicated and variable. For example, the vowel /e/ can be spelt as *e* in *bed* or *ea* in *head*. Therefore, according to Mr. Pang, who had taught in an EMI school for two years, the vowel-based rule may not be as helpful to students compared to the consonant-based strategy. Students should learn consonants first as consonants are in general more predictable and consistent in that students can hear the sound of the word and spell it relatively easily. At the same time, eighteen teachers (30%) agreed that it was important to scaffold the process of spelling and guide students step by step. However, a majority of the teachers (75%) also reported that some students with severe dyslexia may have problems in distinguishing consonants such as /b/ and /d/, and this may not be because of their lack of phonological knowledge, but rather their inability to distinguish the difference between the directions of these two consonants. Therefore, teaching consonants at the beginning can help students resolve their existing problems first, before they move on to learn more advanced knowledge, such as of vowels.

In addition, eighteen teachers (30%) believed that it was better to teach phonological relationships between sounds and letters before introducing morphological rules. They also suggested that teachers should adjust spelling lessons according to students' prior knowledge and need, teaching these rules only when it is necessary.

On the other hand, two teachers (about 7%) believed that the phonological strategy was useful, but not the most effective strategy, and should not be used in the early stage of teaching spelling. Miss Leung, an English language therapist, suggested that phonological relationships between sounds and letters may

sometimes make spelling even more difficult for some learners as they may become confused and distracted when the sound relationship is mentioned. Because of this, best practice is to discover students' difficulties in learning spelling so that further assistance can be offered and amendments be made.

Seven teachers (23%) suggested that the rule-based strategy was the most effective in teaching spelling. Mrs. Lee, a teacher who had been teaching in a CMI secondary school for more than fifteen years, emphasized the importance of teaching rules in teaching English. She stated that if rules such as inflection and derivation were taught, students would understand the way a particular word was formed and they would know how to spell it. After they had got used to the rules, they might know how to spell unfamiliar words by using the morphological rules. However, Mr. Chan pointed out that rules should only be taught in the later stages since rules can be complicated, and students may be confused if both phonological and morphological concepts are introduced at the same time.

Five teachers (17%) commented that to teach students with dyslexia how to spell effectively, an integration of the phonological and the rule-based strategies should be used. This is because both phonological knowledge and rules of the language are essential in learning English. Mr. Ho used an example to illustrate his idea: when students learnt words such as *unsure*, both phonological and morphological knowledge were required as they had to know that *un* was a prefix. To spell the word, they had to remember not only the prefix *un* that carried a negative meaning, but also the pronunciation of the whole word in order to spell it correctly. The magic *e* at the end was also an important feature of some English words that should be mentioned when teaching students spelling. Therefore, he maintained that to teach English to students with dyslexia effectively, the integration of different spelling approaches is essential.

None of the teachers suggested teaching spelling through the visual-imagery strategy. Some teachers argued that although the visual-imagery strategy could be easily adopted, it might only help students cope with short words. For example, if they have to learn words like *bag* and *cat*, the visual-imagery strategy may be useful. However, the method is not effective if students have to learn words such as *satisfaction* and *employment* as none of the features of the target words is mentioned. If students learn through this method, they may only recite or memorize the visual appearance of the word instead of knowing why it is spelt in this way. As a result, they may not know what to do when they come across new vocabulary. Therefore, the majority of the teachers (75%) agreed that when compared to the other four spelling strategies, the visual-imagery strategy was the least effective.

Twenty seven teachers (90%) recommended that instead of teaching spelling with other skills, spelling should be taught separately. They said that the strategy of integrating spelling with other skills such as writing and reading skills can be employed after the students have acquired the basic techniques of spelling and are able to apply these techniques when encountering new words. At this stage, teaching spelling through reading and writing will come naturally.

Besides teaching strategies, the teachers also commented on the teaching elements that were needed to teach students with dyslexia. Miss Cheng stressed the importance of implementing interactive elements. For example, she used colourful flash cards and games during her lessons, and incorporated colourful objects and interesting songs to motivate students. As her students were reluctant to read, it was essential to provide something that might arouse their interest in learning English. Therefore, Miss Cheng believed that these elements were of great importance and should accompany the appropriate teaching strategy. Miss Mak's opinion was similar; she stated that although the students she was teaching were in junior forms, she treated them as primary school pupils, who needed a lot of excitement and stimulation. She therefore prepared a variety of interesting tasks and presentations to motivate learning.

It should be noticed that all teachers emphasized the importance of habit formation, regardless of the effectiveness of different strategies. They pointed out that no matter which strategy was being used, what was more important was helping students apply what they had learnt and develop good spelling habits through practice. As a result, they might learn how to decode and spell unfamiliar words. Therefore, teaching spelling is actually not only about the methods used to spell and to remember the words; what is most important is that students are able to use strategies they are most comfortable with to decode new words and to understand the formation of the words.

*Question Three: Discussion and Implications Concerning the Spelling Strategies*

*How can the strategies recommended by the researchers be used to help junior secondary school students with dyslexia to spell?*

Teachers indicated that the most commonly used and effective strategies for students with dyslexia were the phonological strategy, and the rule-based strategy. It also appeared that although different strategies were suggested by different teachers, it was noted that all teachers agreed that explicit introduction and explanation of the target vocabulary were needed. This echoes the idea mentioned by other researchers (e.g., Darch & Simpson, 1990; Høien & Lundberg, 2000; Pressley, 1999). These authors noted that explicit teaching of spelling was helpful to students with dyslexia in that the rules and components of a word could be explained and analysed. Since students with dyslexia may have difficulties in decoding words, they fail to use a particular method to spell the words, and so explicit instructions should be used. This is quite different from teaching other students because when one teaches students without specific learning difficulties, one does not need to focus on how to spell the words as students may know to divide the words into several components according to their pronunciation or their morphology.

Among the five strategies mentioned in the literature, the phonological strategy was considered the most effective by the majority (60%) of teachers interviewed. These teachers stressed the importance of the relation between sounds and letters in learning English. They also pointed out that learning to relate letters to sounds could help students acquire effective spelling skills. Repeated drilling on such aspects could encourage students to form the habit of paying attention to the sounds and then relating the sounds to the letters. As a result, they might be able to spell independently. This idea is in line with the suggestions in the literature. According to Swerling (2005), the most basic kind of knowledge required for good English spelling involves phonic knowledge, or knowledge of common letter-sound relationships.

Although the phonological strategy was believed to be the most effective strategy in teaching spelling to students with dyslexia, there was a lack of consensus with regard to what kind of words should be taught first, or whether vowels or consonants should be taught first. Indeed, there is no certain answer to such questions. Swerling (2005) examined the effectiveness of spelling strategies in teaching students with specific learning difficulties and suggested that some common irregular words should be taught in the earliest stage of spelling because irregular words such as *of*, *what* and *were* were commonly used in generating a complete sentence. However, if the phonological strategy is employed, the decision about what words should be taught first and together should be based on the words' phonological features rather than on their usage or frequency of occurrence in making sentences. The choice should also be made according to the learner's level. Paying attention to the learner's language proficiency level is necessary so that teachers can adjust their steps and method of teaching according to the students' needs. Swerling (2005) and Moats (2005) advised that consonants should be focused on first if the students have a lower level of language proficiency because introducing vowels may confuse them as vowels involve more complicated letter-sound relationships because of the greater variations and unpredictable patterns. It was also suggested by Moats (2005) that vowels, especially diphthongs, were more complex, and most learners with dyslexia make mistakes in spelling words involving vowels clusters such as /aiə/ in *society*. Therefore, to begin, teachers may focus on similar consonants such as *bay*, *day*, *may*, *pay* and *gay*, if students are of lower language proficiency or with more severe dyslexia. Decoding analogies such as these can complement the phonological strategy so that students can learn accordingly, as suggested by Pressley (1999) and Høien and Lundberg (2000). In addition, easy words should be taught before the more difficult ones so that teachers can scaffold the target knowledge and students can learn step by step.

The effectiveness of the phonological strategy is especially evident among learners with dyslexia in Hong Kong who learn English as a second language. A big difference between English and Chinese is that Chinese is a logographic writing system, while English is an alphabetic one. Drawing students' attention to the phoneme-grapheme relationships can help students familiarise themselves with the writing system. On the other hand, the drawbacks of the phonological strategy should be noted: students cannot use the strategy to cope with all English words as some letters are not pronounced in certain words, such as *k* in *knife* and *h* in *hour*. Consequently, the phonological strategy alone is not adequate in teaching students with dyslexia spelling.

It was found that all the 30 teachers believed that the rule-based strategy was important, but inadequate alone to teach spelling effectively. Some teachers pointed out the importance of teaching morphological rules in English. However, it should be noted that learners with dyslexia need explicit and extra instructions in learning. Darch and colleagues (2000) examined the effectiveness of the rule-based

strategy and found that even if students knew the morphological features of words, they failed to spell the prefixes and suffixes, or even attached these features in the wrong place. Therefore, even if morphological features are taught, teachers still need to find a way to teach students to spell the segments of the target vocabulary.

To some extent, the rule-based strategy is more complex because it requires students to have a deeper understanding about the language, other than the phonological features. Researchers like Darch and Simpson (1990) mentioned that the rule-based strategy may sometimes be difficult to apply for students with learning difficulties. Therefore, it is recommended that teachers should implement the rule-based strategy based on the students' level, with the goal not to confuse the students, but to provide them with extra information and assistance in spelling.

The visual imagery strategy was believed to be the least effective strategy as the effects of visual imagery strategy are rather short term, while phonological and rule-based strategies have more long-term effects on learners. Therefore, if the aim is to enable students to form the habit of decoding in order to spell, the visual imagery strategy, in this aspect, fails to help. It is effective if students are required to spell short words using their short-term memory, but students with dyslexia may fail to recall the words after a short period of time because of their insensibility in letters and sounds. The visual imagery strategy is supported by some researchers such as Sears and Johnson (1986), who pointed out that spelling is a visual activity in which a visual structure in learning is at work, and they concluded from their research that maybe a mental picture is also worth a thousand pronunciations. However, in real practice, students with dyslexia rely on orthographic or phonological decoding, and the morphological features to spell. Therefore, teaching students to pay attention to the visual structure of the words is too random and not effective in teaching students to spell.

More importantly, teachers stressed the problems of whether or not students apply the spelling strategy when they encounter new vocabulary. This was also suggested by Darch and colleagues (2000) that students with specific learning difficulties did not use appropriate strategies when spelling words. As a result, teaching spelling may become ineffective as students do not know how to apply the strategies when they encounter new words. Therefore, as teachers, it is important to help students to form the habit of decoding in order to spell. Ellis (1997) explained the importance of forming habits with reference to behaviourist learning theory, stressing the idea that learning took place when learners had the opportunity to practice making the correct response to a given stimulus. Repeated practice and drilling may be needed to emphasize the importance of decoding a word in order to spell it. Habit forming can be done by having conventional spelling, as suggested by Berninger and Amtmann (2003). Continuing assessment and intervention may also help students with dyslexia, so teachers would need to include more guided practice when a strategy was first introduced so that learning disabled students could efficiently apply strategies when working independently (Darch & Simpson, 1990). Therefore, teaching children with dyslexia spelling is not a short-term pedagogy, but one which may last for a prolonged period.

The above comments show the drawbacks of different strategies in teaching students with dyslexia spelling. Undoubtedly, the phonological strategy is effective in teaching students to relate sounds to letters, but it fails to explain words which involve silent letters. The rule-based strategy succeeds in teaching students to separate the words into segments according to their morphological features, but it may fail to address the spelling problems that the students have. Students may end up learning the rules, but not knowing where to put the morphemes. To help students with their spelling skills, extra instructions are needed. The visual-imagery strategy focuses on the visual features of the words and can be easily adopted. However, it is not a structured and systematic strategy that students can apply individually. Consequently, the implication is that no strategy can stand alone in teaching spelling effectively, and an integration of strategies is recommended because the strategies complement each other. Therefore, teachers can help students in forming the habit of applying the phonological strategy and, at the same time, teach students the rules that they can use when spelling. Høien and Lundberg (2000) pointed out that spelling included many sub-processes, involving phonological, morphological, semantic and orthographic skills. To tailor-make the teaching process, it is advisable that phonological and morphological strategies be applied in an integrated way. The two strategies can work as complementary to each other to be used in explaining word formations to students. It will be the most useful if the intervention in teaching spelling aims at explicitly teaching children different levels of sub-syllabic segmentation, and training them in the acquisition and effective use of multiple decoding strategies (Lovett, Barron, & Benson, 2003).

While the focus of the literature on this topic is often the implementation of spelling strategies, the teaching elements involved in real practice should also be stressed. For example, students with dyslexia may be discouraged by the long words and passages they are asked to read. Therefore, attractive visual aids should be used in order to attract their attention and arouse their interest in learning. The use of pictures is essential as *people with dyslexia are visual and multi-dimensional thinkers* (Davis & Braun, 2010). By using pictures and objects in teaching spelling, teachers can utilize the students' strengths in learning, which can help students improve their confidence in learning.

To set appropriate learning goals and learning focuses for each lesson, teachers should prepare well before the lessons, observe the students' learning behaviours and reactions in the lessons and reflect after the lessons. Doing so may allow teachers to adjust their teaching strategies accordingly based on the level of the students and their learning progress.

#### *Limitations*

The current research has some limitations. First of all, the scale of the research is not large, as only 30 secondary school teachers in Hong Kong were interviewed. As a result, it is impossible to identify all effective strategies used for teaching spelling to students with dyslexia.

The strategies suggested were applied to students with dyslexia in general; individual differences were not considered. To find out the most effective strategy in teaching children with dyslexia spelling, learning styles and preferences, language proficiency and learning habits should all be taken into account so as to conduct the most suitable and most effective strategy to teach.

#### **Conclusion and Implications**

Like many other parts of the world, in Hong Kong, most students with dyslexia study in general education schools. As they have special needs in learning, extra assistance should be offered. Campbell, Soler and Reid (2009) suggested that students with dyslexia work and learn with their average counterparts so that those who encounter difficulties in learning may improve their self-esteem and also their confidence in learning. However, while special organized and structured treatment programmes have been proposed by many researchers, it is believed that extra learning sessions offered only to students with dyslexia are essential so that teachers can more closely follow the students learning progress.

Spelling is a complex process, which involves different skills at the same time when a word is spelt. In this study, 18 of the 30 participants (60%) agreed that the phonological strategy was very important; seven (23%) proposed the use of the rule-based strategy; and five (17%) recommended an integration of phonological and rule-based strategies. The teachers, at the same time, pointed out both the strengths and weaknesses of the strategies. They also suggested that the phonological strategy, the rule-based strategy and the visual imagery strategy cannot stand alone effectively. Findings of this study indicate that an integration of the strategies help students learn to employ different strategy to spell different words. Helping students to form a habit of decoding words systematically can bring the biggest benefits to students, especially those with dyslexia because they have deficiencies in referring sounds to letters and in decoding. At the same time, teachers should be able to offer immediate response and feedback to students, to scaffold the teaching steps as well as to assist them in their learning journey.

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