Selecting Marine Picture Books from Perspective of Readability and Vocabulary size

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Abstract

To increase marine literacy among people of all ages and at all levels has become a crucial Marine Policy goal for the Ministry of Education in Taiwan. With the development of marine education, Taiwan can become a modern oceanic country and simultaneously promote aesthetic taste and refinement. Lacking adequate Chinese language teaching and learning marine education materials, English educators in Taiwan should consider seeking help from English picture books. Studies on the effects of literature-based curriculum suggest the advantages of implementing picture books in science courses. Accordingly, it may be very beneficial for EFL teachers to be aware of the criteria for selecting readable English picture books for Taiwanese students, as well as knowing how to enhance students’ appreciation of children’s literature and art related to marine science.

Five purposes are listed in this paper. The first one is to illustrate the rationale of selecting marine picture books for Taiwanese students by tallying EFL readability index and measuring their vocabulary size. Second, the researcher enumerates two marine picture books which are readable for EFL students. Third, the appreciation of these marine picture books is discussed. Other viewpoints regarding the contradictions between scientific facts and children’s literature will also be clarified. Finally, suggestions for both instructional practice and future studies will be provided for EFL teachers, educators and administrators.

Key words: Marine picture books, EFL readability, children literature, vocabulary size.

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I. Introduction

The Ministry of Education (MOE) drafted the White Paper on Marine Education Policies in order to define its development goals and strategies for marine education in Taiwan (2007). It is hoped that the development of marine education will help Taiwan become a modern oceanic country of aesthetic taste and refinement. This act aroused educators’ concern over oceanic issues. Marine education had been a fairly new domain for schools at all levels, and now seminars and workshops held by the Ministry of Education and the Bureaus of Education around Taiwan have begun to facilitate school teachers to teach marine knowledge and ocean spirit through content-based courses—that is, to integrate marine knowledge with current subjects such as Language arts, Math, English, etc.

As the aim of the change which the MOE hopes to instill is at the socio-cultural level, new education must begin at the earliest reasonable age. Studies of the effects of literature-based curriculum suggest the advantages of implementing picture books in science courses for young learners. If it can be shown to be an effective pedagogical tool, a picture book used to enhance the content focus in language arts should serve as a good model for educators. Therefore, it has become crucial to increase marine literacy among people of all ages and at all levels by providing students with quality picture books about marine knowledge. The MOE’s objective of increasing awareness of marine life among older students may be achieved relatively easily by inserting appropriate material into science curricula. To effectively teach children, however, will be more difficult, and will require high quality picture books to attract their attention and impress their young minds. However, as presently we are lacking adequately high-quality marine education materials in locally available Taiwanese books, English educators might want to consider seeking some helps from English picture books. Accordingly, it is necessary for EFL teachers to be aware of the criteria for selecting appropriately readable English picture books for young Taiwanese students and know how to use them not only to enhance students’ appreciation of children’s literature and art, but also to meet the government’s goal of instilling awareness related to marine science.

The researcher considers it both feasible and suitable to incorporate marine issues into English teaching using picture books. By doing so, students will be able to get knowledge and understanding of the oceans, cultivate their love for the sea, and establish proper values while also learning English. This will enable the realization of simultaneously fostering Taiwanese citizens’ international and local perspectives regarding marine issues.

This paper has five main purposes. The first one is to illustrate the rationale of selecting marine picture books for Taiwanese students by tallying books’ EFL readability index and measuring their vocabulary size. Second, the researcher enumerates two marine picture books which are readable for EFL students. Third, the appreciation of these marine picture books will be discussed. Other viewpoints regarding the contradictions between scientific facts and children’s’ literature will also be clarified. Finally, suggestions for both instructional practice and future studies will be provided for EFL teachers, educators and administrators.

II. Children’s Literature & Picture Books

literature can be good for acquiring literacy, for expanding the imagination, and for dealing with issues or for coping with problems. Scholars claim that an ideal way to educate through vicarious means is through literature, and if our goal is to educate about marine issues, then we must seek “to find and read to children the best stories of the sea” (Bagrall, 1981). The bountiful benefits of children’s literature have been confirmed in numerous studies. For example, Yoo (1997) shows that children’s literature can help children share pleasure, personal experiences, and cultural heritage. Experiencing children’s literature is also valuable for promoting children’s language development (Chomsky, 1972).

Regarded as one category of children literature (Costello & Bagnall, 1981), picture books constitute a compound which reflects the “union of text and art that results in something beyond what each form separately contributes” (Wolfenbarger & Sipe, 2007, 273). Teachers can provide a wider variety of picture books to enhance their science curricula by incorporating picture books in content area classrooms. Picture book writers have often used the sea as a theme for children since “abstract concepts in science…can be given more concrete and visual connections to students’ experiences by using the visual examples, models, and diagrams in a picture book on the topic being presented” (Miller, 1998, p.377). A picture book employed to teach marine science in a classroom displays visual images to facilitate the learning of complex oceanic concepts and knowledge. The illustrations in a science-oriented picture book will help learners to, both literally and figuratively, “get the picture.” Also, a picture book used to teach marine science presents the possibility of inspiring research projects. To be more specific, picture books featuring biographies of celebrated scientists could lead to in-depth research projects in schools.

According to Fralick (1999), general considerations in selecting picture books include: (1) The teacher’s personal enthusiasm for the book; (2) the book’s ability to achieve the objectives of a particular lesson; (3) the book’s intensity of information, ability to meet high literary standards, and portrayal of diversity.

Based on the statement above, the majority of scholarly literature (Giorgis, 1999; Oleson, 1998) about using picture books with elementary or middle school students focuses on how the books are to be used. Picture books are seen as a type of children’s literature. Teachers who wish to incorporate picture books in content area classrooms focusing on the sea should select a wider variety of picture books to enhance their marine curricula. In addition, illustrations in picture books help students comprehend the text as it relates to the ocean.

III. Rationale for Selecting Marine Picture Books

When browsing for suitable and feasible picture books, a logical rationale for selecting one marine picture book over another to be used in a literature-based course is needed. Picture books, whether fiction or nonfiction may be considered appropriate texts for marine education. The contents of picture books related to marine science and ocean spirit which have been emphasized by the MOE will now be considered. Naturally, gorgeous illustrations and photographs in picture books will contribute to children’s comprehension of scientific knowledge and may also, if properly used by an experienced teacher, help students progress in English.

The brevity and simplicity of picture books make them ideal for facilitating the learning of literary devices in English. When selecting a text, picture books that have won awards such as the
Caldecott Award ¹, should be given primary consideration. In addition to the picture books of the sea, individual stories and poems which have a bearing on sea literature are considered.

The Flesch-Kincaid Grade level designation tool in Microsoft Word should be applied to select for a particular text (Gerrard, 2008), considering the readability of a picture book. In addition, the instructor could select distinct artistic style which were also representative of a particular genre or distinctive style of writing (Madura, 1998). Participants’ responses of the selected picture books should be taken into consideration as well (Gerrard, 2008).

For this study, The Mousehole Cat and Grandfather’s journey were selected by the researcher because they both were the Caldecott Award books and mentioned broadly in the precedent literature. For the appropriateness, readability of these books was computed first. Two senior high school students and two seventh graders were invited to participate in piloting these two selected books. All of them presented positive attitudes toward those books.

**IV. EFL Readability Index**

When discussing the selection of the best ability-appropriate English texts for students, readability has long been the crucial issue in numerous studies. According to Nation (2001), the basic concept involved in the analysis of texts is readability, which refers to the various aspects of a text that are likely to make it easy or difficult for a reader to understand and enjoy. Simple readability formulas focus on two variables: the frequency of a particular set of vocabulary and the length of the sentences in the text. In the early days of the modern educational movement, formulas were created and utilized to measure authentic texts to define their levels for native English readers. However, these formulas are likely to be inappropriate and invalid for EFL readers. Regarding this, various research has shown differing results (Brown, 1998; Greenfield 1999).

Regardless of those complicated formulas, Greenfields (2004) has developed the Miyazaki EFL readability index ² by computing average word number per sentence and average letters per word using Microsoft Word. Vierra (2004) states the procedure as follows:

To get these scores to show up on the screen, “first go to Tools (T); then go to Options (O). On the new menu, choose Spelling & Grammar. In the spelling section, choose check spelling as you type and always make suggestions. In the grammar section, choose check grammar as you type and check grammar with spelling and show readability statistics.” (p.73)

The reading ease score reflects “the word, sentence, and paragraph lengths and the number of “passive” grammatical constructions used in a text” (Vierra, 2004, p.72). The Flesch Reading Ease score (see Table 1), rates texts on a 100-point scale and may be applied to compare a matching number on the Miyazaki EFL readability index table. The matching number represents the readability of the picture book selected.

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¹ Caldecott Award. The Caldecott Medal is awarded by the American Library Association to the artist of the most distinguished picture book published that year.

² Miyazaki EFL readability index. can be downloaded at: http://www.miyazaki-mic.ac.jp/faculty/jgreenfi/MEF LRI_table.pdf
V. Vocabulary Count through Range 32

“Words are the basic building blocks of language, the units of meaning from which larger structures such as sentences, paragraphs, and texts are formed” (Read, 2000, p.1). Nation and Meara (2002) claim that the most conservative manner of counting involves the use of lemmas. Accordingly, the words talk, talks, talked, and talking are members of the same lemma because they (a) share the same stem (talk), (b) include only the stem and its inflected forms (talks, talked, and talking), and (c) are all verbs. Nation (2001) points out that the use of lemmas as a unit of counting greatly reduces the number of units in a corpus. “A word family consists of a base word together with its inflected and derived forms that share the same meaning” (Read, 2000, p.84). For example, the word forms reads, reading, readable, reader, and readability can be seen as the members of a family headed by the base form read.

In order to compare the picture books for marine education with the General Service List of English Words (hereafter GSL word list), the software, RANGE323, released on 7 February, 2005, has been used in the present research to calculate the coverage and range of the word lists among different corpora. Three base lists are available. The first (BASEWRD1.txt) contains the most frequent 1000 words of English, the second (BASEWRD2.txt) includes the second 1000 most frequent words and is based on the General Service List of English Words by Michael West, and the third (BASEWRD3.txt) is the Academic Word List by Coxhead (2000). The program also allows users to add word lists. Results through RANGE 32 show the following three parts of vocabulary size:

1. Tokens (running words) are the total number of word forms in a text when an individual word that occurs more than once in the text is counted each time it is used (Read, 2000).

2. Word type: The number of word types is the total number of different word forms used in a text when a word that is repeated many times in the text is only counted once (Read, 2000).

3. Word family: A set of word forms sharing a common meaning (Read, 2000), comprising the base word along with its inflections and derivatives (e.g., stimulate: stimulated, stimulates, stimulating, stimulation, stimulant, and stimulative; Schmitt & McCarthy, 1997).

VI. Quality Books for Marine Education

In this section, two exemplary marine picture books are processed using Range 32 to make word lists and generate tables of word families. The first picture book is The Mousehole Cat (1990) written by Antonia Barber and illustrated by Nicola Bayley. First of all, the researcher typed each word in The Mousehole Cat into Microsoft Word file and checked the number of letters per word and words per sentence in order to match the readability index from

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3 RANG 32 can be downloaded at: http://www.vuw.ac.nz/lals/staff/paul-nation/RANGE32GSL.zip.
Miyazaki EFL readability index. The results showed that there are 81 paragraphs, 133 sentences 1.6 sentences per paragraph, 2193 words, 4.2 letters per word, and 16.4 per sentence in this book. Based on two key numbers, 16.4 and 4.2, it was found that the reading ease is 80.2. This represents a sixth grade level for native speakers of English (see Table 1 Flesch Reading Ease Index Table); however, the EFL readability index comes out to 55 using the Miyazaki EFL readability index table which suggests a level appropriate for senior high school students in an EFL setting.

By following the same criteria, the results of vocabulary size using the Range 32 system are summarized in Table 2. Using the Range 32 guidelines there are only 2205 words in this book whereas Microsoft Word says there are 2193. This discrepancy results because compounds and contractions cannot be identified by the Range 32 software. The results reveal that there are 642 types of words and 419 word families in this book. In addition, there are 112 words which are not included in any of the three lists. Those words are specific words such as pilchards (a type of fish), Mousehole (a place), and Storm-Kitten (compound word).

<table>
<thead>
<tr>
<th>WORD LIST</th>
<th>TOKENS/%</th>
<th>TYPES/%</th>
<th>FAMILIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>1721/78.05</td>
<td>382/59.50</td>
<td>293</td>
</tr>
<tr>
<td>Two</td>
<td>164/7.44</td>
<td>103/16.04</td>
<td>87</td>
</tr>
<tr>
<td>Three</td>
<td>58/2.2</td>
<td>45/7.01</td>
<td>39</td>
</tr>
<tr>
<td>Not in the lists</td>
<td>262/11.88</td>
<td>112/17.45</td>
<td>??????</td>
</tr>
<tr>
<td>Total</td>
<td>2205</td>
<td>642</td>
<td>419</td>
</tr>
</tbody>
</table>

In the second picture book, *Grandfather’s Journey* by Allen Say, there are a total of 569 words (234 word types and 173 families). Microsoft Word tells us there are 11.5 words per sentence and 4.2 letters per word. The EFL readability index is therefore 63, representing a reading level of 7th grade to 8th grade in Taiwan.

**VII. Appreciation of Marine Picture**

These two picture books have each won the Caldecott Award and may be regarded as high quality children’s literature. The first book, *The Mousehole Cat*, is full of figurative languages, such as metaphor, simile, and personification. It also gives the reader a fairly well-rounded picture of the typical life in a little harbor in England and shows the fear of the fishermen when encountering a terrible storm.

As for the second book, the ocean spirit of Japanese immigrants to the United States is highlighted. For example, it is pointed out that long before World War II, the important transportation for ocean crossings was steamships instead of airplanes. The story tells how the main character, Grandfather, was brave enough to spend three weeks on a steamship and was astonished by the endless ocean. Liao, the writer of Ocean literature in Taiwan, views *Ocean spirit* as promoting attitudes such as being positive, adventurous, painstaking, vigorous, and aggressive toward problems encountered. He continues to explain that we, living in a small island, do not have choices to avoid challenges, pressures, and dangers. With limited natural resources, therefore, we must bravely face challenges. Crossing the Pacific on a steamship, the main character in *Grandfather's Journey* presents his ocean spirit to explore the new world. He discovered that the more he traveled, the more he longed to see new places.
Table 3 Vocabulary size of Grandfather’s journey

<table>
<thead>
<tr>
<th>WORD LIST</th>
<th>TOKENS /%</th>
<th>TYPES /%</th>
<th>FAMILIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>503/88.40</td>
<td>185/79.06</td>
<td>153</td>
</tr>
<tr>
<td>Two</td>
<td>27/ 4.75</td>
<td>19/ 8.12</td>
<td>18</td>
</tr>
<tr>
<td>Three</td>
<td>3/ 0.53</td>
<td>2/ 0.85</td>
<td>2</td>
</tr>
<tr>
<td>Not in the lists</td>
<td>36/ 6.33</td>
<td>28/11.97</td>
<td>??????</td>
</tr>
<tr>
<td>Total</td>
<td>569</td>
<td>234</td>
<td>173</td>
</tr>
</tbody>
</table>

VIII. Contradictions between Scientific Facts and Children’s literature

In education, the contradictions between scientific facts and children’s literature should be taken into consideration. When selecting marine picture books we, as teachers, should pay attention to the scientific facts presented. However, too much scientific information may make the texts too difficult and therefore unattractive for EFL readers. Moreover, some plots in fictional stories may pose controversial issue for educators. Some may regard more colorful plots as richly imaginative, whereas others may consider them mere nonsense and inappropriate for children. Another controversial point is whether all Caldecott Award books truly are good-quality children’s literature. Some best sellers, in fact, might be neither scientific picture books nor good-quality children literature.

VIII. Conclusion and Suggestions

In conclusion, marine picture books which may be considered most readable for Taiwanese students should be selected by educators and teachers who can easily follow the rationale and selection criteria mentioned in this paper. Considering the EFL readers’ English proficiency, Miyazaki EFL readability index formulated by Greenfield (1999) is applicable when evaluating picture books for marine education. The instruments such as Range 32 and Microsoft Word readability measurement are suggested for English teachers because they are both useful and handy. Even though only two picture books are introduced in this paper, English teachers are encouraged to seek out additional marine picture books and examine their suitability using these instruments. Furthermore, contradictions between scientific facts and children literature should be taken into account when selecting picture books for marine instructions.

References


**Picture books cited**


以可讀性與字彙量觀點選擇海洋繪本

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摘 要

為各個教育階段設計海洋文學教材，是台灣海洋教育政策中最重要的一環。隨著海洋教育的推動，台灣成為富有藝術氣息的海洋國家。然而，缺乏適合的海洋教育教材，英語教學者試著從英語繪本來尋找可讀性高的教材。許多文學融入教學的研究指出，運用繪本於科學教育的成效卓著。因此，英語為外語的學者和教師們，有必要了解有關為台灣學生選擇可讀性高的英語繪本的規準，和如何提昇學生欣賞海洋教育類的兒童文學作品。

本文的目的有五項：首先，說明為台灣學生選擇可讀性高的英語繪本的規準。第二，研究者列舉二本可讀性高的海洋繪本。第三，海洋繪本欣賞與討論。第四，討論對於海洋科學與兒童文學之間的矛盾與爭議。最後，對學者、教師和行政人員提出教學實務和未來研究的建議。

關鍵詞：海洋繪本，英語為外語之可讀性，兒童文學，字彙量。