

Using the Interactive Whiteboards to Teach Picture Books the Case of Taiwan

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Abstract

Since literacy is essential for learning, one of the main purposes of elementary school is to enhance students' literacy skills. In many countries, it's quite common to use an interactive whiteboard in class, and Taiwan is no exception. The purpose of this study was to determine the effectiveness of using an interactive whiteboard to teach picture books. A mixed-method approach was used in this study. Interactive whiteboards were used to teach picture books to four classes at an elementary school. A pre- and post-test were used to evaluate the increases in the vocabulary of the students. Furthermore, the four participating teachers were interviewed to determine their views on using an interactive whiteboard to teach picture books. The results indicate that using the interactive whiteboard in the lower grades increases the students' interest in reading at school and improves their level of literacy. Based on the results, some suggestions are provided for schools.

Keywords: electronic whiteboard, picture book, literacy, Taiwan

1. Introduction

The Programme for International Student Assessment (PISA) carried out by the Organisation for Economic Co-operation and Development (OECD) in 2001 shows that the better one's reading ability, the easier it is to collect and comprehend information. Indeed, literacy is essential for full participation in modern society. Interactive whiteboards are now regularly used in some schools. The purpose of this study was to determine the effectiveness of using an interactive whiteboard to teach picture books. The research questions were as follows: Does applying the interactive whiteboard to teaching picture books enhance the literacy of the students, especially for low-achievers? How does the reading behavior of students in the lower grades change when the interactive whiteboard is used to teach picture books? What influence does the use of the electronic whiteboard have on how teachers teach classes in life education? What practical approaches are available for helping teachers to cooperate with professional groups, share their teaching experience, and promote reading education in schools?

With an array of interesting illustrations, picture books readily attract children's attention, and are thus highly suitable for enhancing reading ability in the first years of elementary school. One of the results of steady advances in digital technology is that many children's picture books are now available as e-books, a multimedia format which is increasingly familiar to children. So, just how effective are electronic picture books for enhancing the literacy of students at the primary level? In many countries, it's already quite common to use interactive whiteboards in class. For instance, developed countries, such as Britain, the United States, Austria, Singapore, and Japan, routinely invest significant amounts of money to improve educational facilities, including interactive whiteboards (Lewin, Somekh, & Steadman, 2008). Also, research has found that the interactive whiteboard helps motivate students to learn (Harlow, Cowie, & Heazlewood, 2010; Torff & Tirota, 2010). In recent years, interactive whiteboards have also become common in Taiwanese classrooms. The purpose of this study was to determine how effective interactive whiteboards are for teaching picture books.

Traditional picture books are limited to the text and illustrations, while electronic picture books also have audio, video, and animation. Undoubtedly, such multimedia make picture books more vivid and attractive to children (Korat & Shamir, 2006). Schwier and Misanchuk (1993) divide the way students interact with a book into three levels: reactive interaction, proactive interaction, and mutual interaction. When students use ordinary electronic books, they tend to only accept the stimulation passively—reactive interaction. However, by using an interactive whiteboard to teach an electronic picture book, the teacher helps the students to engage in the material—proactive interaction. Meanwhile, not only is the interaction between the teacher and students increased, but also the interaction between the students themselves—mutual interaction (Miller & Glover, 2010). There are three main reasons why students like the electronic whiteboard. The first reason is that the interactive whiteboard is versatile and integrates the Internet, educational software, videos, etc. Secondly, it is a multimedia format. Most important of all, students find the interactive whiteboard fascinating. In addition, teachers can provide interpretations and additional information on vocabulary as required. Simultaneously, teachers can link to websites and search for images which further their comprehension of a picture book (Hall & Higgins, 2005). The studies mentioned above found that students are fond of being taught with the interactive whiteboard; however, none of these studies examined the effects of using the interactive whiteboard on learning.

Teaching picture books with an interactive whiteboard helps to enhance students' learning and motivation. By doing so, it also improves students' academic performance and concentration (Murcia, 2008; Terreni, 2010; Wall, Higgins, & Smith, 2005). Talley, Lancy & Lee (1997) found that preschoolers who had read electronic picture books at home demonstrate more willingness to read. Furthermore, electronic picture books improve preschool literacy. Korat & Shamir (2006) found that the students who read and play with electronic books have a higher level of literacy than those who learn by reading conventional story books. Similarly, Doty, Popplewell & Byers (2001) found that the academic performance of early adolescents who read electronic picture books is better than those who don't. However, no significant differences have been found in the comprehension and oral description ability of students who read electronic picture books and those who read traditional picture books.

The interactive whiteboard helps develop student creativity, and has a good effect on course instruction and the process of learning (Wood & Ashfield, 2008). Kelley (2012) found that use of an interactive whiteboard helped to improve secondary student's performance in algebra. The interactive whiteboard clearly has a positive effect on teaching and learning; nevertheless, before utilizing it in a course, a teacher needs to first understand how to effectively apply it to a given teaching activity.

These studies found that using the interactive whiteboard enhances the learning of preschool and secondary students. However, few studies have examined whether their use enhances the literacy of students in the lower grades.

Related studies in Taiwan suggest that combining the interactive whiteboard with instruction is likely to enhance students' learning motivation and attitude (Lu & Chen, 2008; Huang, 2009; Lin, 2010). Through the use of animation, the interactive whiteboard quickly and vividly conveys messages, thereby enhancing children's comprehension, imagination, and willingness to read.

Students find that using the interactive whiteboard in class quickens the tempo, making the lesson more interesting and exciting (Levy, 2002). The interactive whiteboard is a kind of colorful and concrete learning tool that teachers can use to instantly highlight information with different colors, at the same time satisfying students' thirst for lots of images. Further, the interactive style of the interactive whiteboard motivates students to learn (Glover & Miller, 2001; Kennewell & Beauchamp, 2007).

Glover & Miller (2001) found that when students use the interactive whiteboard to share their ideas with each other in class, they are likely to pay more attention, because it shows the results of their discussion briefly and clearly, making it easier to find and correct mistakes. Moreover, the use of the interactive whiteboard to present diverse information is attractive to students and enhances their concentration. It also increases students' interest in learning and supports their construction of knowledge (Hall & Higgins, 2005; Schmid, 2008; Slay et al., 2008; Wall et al., 2005). Students hold positive attitudes toward the interactive whiteboard, while teachers can use it to create a lively learning environment and make learning activities more exciting (Gatlin, 2004). Therefore, students find that the interactive whiteboard helps them to comprehend the concepts that the teacher explains; it also motivates teachers to be more enthusiastic and creative in their teaching (Selwyn, Potter, & Cranmer, 2009; Wood & Ashfield, 2008).

Up to the present, no studies have been done on the use of the interactive whiteboard to enhance reading ability in mixed approach. However, since the whiteboard is interactive, allows learners to practice repeatedly, and

includes diverse kinds of multimedia stimuli which can be adjusted to match the students' ability, the interactive whiteboard is likely to assist first graders in reading and recognizing terms.

2. Research Methodology

2.1 Research Site and Participants

This study was carried out at an elementary school located in the south of Taiwan. In this school district, most students are from working class families. The total number of students at the school is around 500, about 50 of whom are raised by their grandparents or have a mother who recently immigrated from abroad. Also, some of the students' parents seldom read with their children, and such low-achieving students tend to have a limited vocabulary and little interest in reading.

Many teachers at the school are young and highly educated. Among the 32 teachers, about 1/3 have a master's degree and 1/3 are attending graduate school. Such teachers are well disposed to accepting new modes of teaching. The school endeavors to mold its curriculum planning and school culture into an example of school-based community and a community-based school. The research participants consisted of the students in four first-grade classes. After the school administrators presented the idea of using the interactive whiteboard to teach picture books, the teachers engaged in discussions, chose some picture books, and then designed their teaching materials using the interactive whiteboard. They also designed the pre- and post-tests for evaluating the students' literacy levels.

2.2 Research Methods

This study examined the influence using the interactive whiteboard in class has on students' literacy level and reading behavior. The former was measured by analyzing the students' scores on a pre- and post-test. The latter was determined by observing the changes in the students' reading behavior over a long time, for which purpose in-depth interviews were conducted with the teachers. Therefore, a mixed-method approach was used to gather the data.

2.2.1 Quantitative Data

The quantitative data was gathered through the five pre- and post-tests and the questionnaire. First, the teachers choose 30 words from the picture books to be the test material; these 30 words are frequently used, but not taught in the Mandarin textbook. Next, a test was conducted for each group and the leader of the group put a check mark on the correct pronunciation. The test was designed by the same teachers who created the electronic picture books.

Besides conducting the pre- and post-tests, a half-open questionnaire was used to obtain the students' opinions on the use of the interactive whiteboard for teaching picture books. The questionnaire was divided into two parts: (1) 11 close-questions were used to obtain the students' opinions of the class design and teaching activities. (2) Two half-open questions were used to determine the students' attitudes about learning.

2.2.2 Classroom Observation and Interviews

Each class was observed three times, focusing on the teacher's teaching procedures and the students' responses and level of attention. The individual interviews were held shortly after the observation.

Semi-structured interviews lasting 30–60 minutes were carried out with each teacher without a fixed schedule. Moreover, four group interviews were carried out, each lasting 60–90 minutes, in which the researcher observed and evaluated the interaction of the teachers. Through these observations and interviews, I gathered information on the changes which took place in the students' reading behavior and their attitudes towards reading.

3. Research Results

3.1 The Teacher Team

A teacher team was formed at the school for facilitating the innovative use of information technology to enhance the literacy of the students. The team designed electronic teaching materials and videos of the teaching procedures and placed them on a teaching platform for use by the other teachers at the school. Moreover, the team designed interactive games based on picture books and placed them on the school's website for convenient access by other teachers. The students enjoy these teaching activities designed by teachers, and can also read the picture books and do the learning activities by themselves.

T1: The students like to listen to the stories . . . and they also like to play the games. The last part of the lesson is the game. They look forward to playing the games after class. (1000607)

The flash cards with pictures are effective at keeping the students' attention.

T2: Yes. Next are the words! I think that students like to see the pictures. (10006014)

T1 found that students like listening to the stories while reading the picture books, which is rather like watching a movie. Also, the distinctive voices in the picture books helps keep the students interested. Using the interactive whiteboard to teach picture books is a way of blending technology with teaching, and this helps to promote interaction between teachers and students. Moreover, additional learning activities can be added at any time. Through the classroom observation it was found that the students were enthusiastic about participating in class. It was also found that by cooperating and sharing their teaching materials, the teachers not only lightened their burden, but also enhanced their expertise.

3.2 Enhancing the Students' Literacy

Five picture books were used to measure the students' literacy levels.

Table 1. The pre- and post-tests of the literacy level of the higher-achieved group

Test	Book 1	Book 2	Book 3	Book 4	Book 5
Pre-test	92.46%	83.20%	90.87%	91.60%	91.12%
Post-test	98.12%	92.70%	97.13%	97.68%	96.84%
Difference	5.66%	9.5%	6.08%	6.26%	5.72%

By comparing the results of the pre- and post-tests, it can be seen that after using the interactive whiteboard the students' literacy level improved for each of the five picture books. The differences were between 5.66% and 9.5%.

For the students in the lower-achieving group, the increase in literacy level was much higher. The differences were between 7.59% and 12.96%.

Table 2. The pre- and post-tests of the literacy level of the lower-achieving group (under PR33)

Test	Book 1	Book 2	Book 3	Book 4	Book 5
Pre-test	86.43%	77.40%	87.20%	82.96%	83.41%
Post-test	94.13%	90.36%	94.60%	91.44%	91.00%
Difference	7.7%	12.96%	7.40%	8.48%	7.59%

3.3 More Positive Learning Attitudes

Compared with the traditional way of teaching picture books, use of the interactive whiteboard enhances teaching creativity. Most students enjoy using the interactive whiteboard to read picture books; they feel less pressure in these classes and look forward to them.

T3: "Ok, now we are going to listen to the picture book story," the teacher said. When the students know that it's time for the picture book class, they become rather excited. (1000614)

"The students are highly active in the picture book class, unlike in the other classes," one of the teachers, T3 said. Because of their fondness for this class, the students urge the teacher to start teaching at once.

One teacher (T4) reported that some of the students came and told her that they liked the picture book class and that this enhanced their interest in reading.

3.4 Narrowing the Gap between the Students and the Books

This kind of course can motivate the students' reading interest and ability. Before the picture book class was taught with the interactive whiteboard, many students were uninterested in reading books with lots of new words. Afterwards, however, the students could read the printed books on their own and learn the new words.

T4: Yes. They became more willing to read the words. Before, because they were not good at reading, they disliked reading the words and only looked at the pictures. Now, after using the interactive whiteboard to teach the picture books, they can gradually read those new words. This is helpful to their reading and makes them more and more interested. (1000602)

After the class, the students actively sought out the picture books in the bookcase in the corner of the classroom, or borrowed books from the library to do more detailed reading. Due to the experience of reading the electronic picture books, the students were inspired to read the same books together after class. In addition to the improvement in their reading ability, the students also learned the enjoyment of sharing.

T4: Right. Sometimes they will read a book together. When someone finds a fun and interesting book, they like to read it together; the better students teach the others. This is also an effective way to learn. (1000602)

When the students found one of the picture books taught in class elsewhere, they became excited.

T3: They sometimes tell me that they found the same book in the library . . . When they find the book, they excitedly run over and say, “This is the same book we read in class!” I guess the students like reading. (1000614)

3.5 Applying the Content of the Picture Books to Life Education

After teaching the picture books, the teachers applied the appropriate concepts in them to teach related lessons.

T2: On one occasion the school was promoting water conservation, but the students still wasted lots of water. Thus, I emphasized the importance of water conservation with picture book 3, Mottainai Grandma, and the students began to self-reflect about their wasteful behavior in daily life. (1000608)

T1: The students can play the interactive games after class. This gives them a deeper impression of the words, and it reinforces the concept of taking turns.

When the study was finished, the members of the teacher team decided to continue their work in teacher professional development. These teachers found that the picture book classes also had much influence on the other subjects they taught.

T3: We found that the students like to actively participate in expressive games and acting. The interactive materials produced by the digital media are especially good at catching the students' eyes. In the future, the digital media can be integrated into the teaching of other subjects, which will enhance the students' motivation to learn. (1000614)

4. Discussion and Conclusion

In this study a teacher team was founded for carrying out a creative teaching program. After using the interactive whiteboard to teach the five picture books, the students' reading comprehension was enhanced by over 6%. The reading comprehension of the students with lower reading achievement (under PR33) progressed by about 10%. Thus the use of the interactive whiteboard to teach picture books resulted in more improvement for students in the lower-achieving group. However, determining whether the students' overall academic achievement was enhanced, as was found by Doty et al. (2001), will require additional research.

Furthermore, in this study it was found that the attitude of the students became more positive because they enjoyed the relaxed atmosphere of the picture book class. This agrees with Talley's (1994) finding that preschoolers who read electronic picture books at home demonstrate more willingness to read. When students learn more words, they are more willing to read. After students become familiar with the content of an electronic picture book, they become interested in reading the printed version of the same book at school. Moreover, the students share the stories with their classmates, and students with a higher reading level teach the other students. Further, teachers can apply the content of the picture books to life education. This agrees with the findings of Lu and Chen (2008), Huang (2009) and Lin (2010), that combining the interactive whiteboard with instruction is likely to motivate students and thereby enhance their willingness to read, improve their comprehension, and extend their imagination.

5. Limitation and Recommendations

This study shows that applying the interactive whiteboard to teaching picture books is effective in enhancing the literacy of students in the lower grades, especially for lower-achieving students. Using the interactive whiteboard to teach picture books can enhance students' interest in reading. The research is based on a mixed-method approach, which is a combination of pre- and post-test, observations and in-depth interviews. The authors

applied this approach in four classes in a school of Taiwan. Since the samples of this study were limited and the substance of a qualitative research is not to refer the findings to all cases, thus the limitation of this study is that the results and findings can only explain students' reading behavior and attitude in the similar context of Taiwan. Some future research implications are generated as the suggestions that schools can encourage their teachers to establish a professional development community of promoting the incorporation of interactive whiteboards into creative teaching and curriculum design. Additional researches were needed to determine whether or not similar results can be found amongst students in higher grades.

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