The effect of the Mozart music on learning anxiety and reading comprehension on Chinese storybook reading

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Abstract: Reading ability is the basic skill to enhance the competitiveness of the national economy. Through a large number of reading content, students can develop high-level thinking skills. Anxiety is an import factor to affect students' learning when they are reading materials. Some studies found suitable music can reduce people stress feeling. In order to investigate the effectiveness of music on learning, this study used Mozart music in a reading process with Chinese storybook. The results show that Mozart music has an impact on the improvement of students' reading comprehension. However, we also found that the Mozart music couldn't reduced the students' learning anxiety in our study.

Keywords: Mozart music, Learning anxiety, Reading Comprehension, Chinese storybook, Elementary school student

1. Introduction

The national reading ability is closely related to the competitiveness of the national economy and the cultural level. Enhancing students' reading ability has become a key policy of all the countries in the basic education stage. The appraisal report of the 2009 Programme for International Student Assessment (PISA) presented that the ranking of Taiwan students' reading literacy slipped to 23 in 2009 from 16 in 2006, and lost in Shanghai, Hong Kong, Singapore and Japan on the overall performance in Asia (Perkins, Moran, Cosgrove, & Shiel, 2011). The result shows that other Asian countries are committed to enhance reading ability of their students. It is crucial that Taiwanese government needs to face squarely the problems of reading-related issues in education.

Chall (1983) divided the development of children's reading into six stages which are divided two parts that are the former third-grade "learning to read" stage, and elementary school after the fourth grade "learning from reading" stage. The main task of the former is to learn how to read, and the latter is to learn a variety of knowledge by using reading as a tool. For the elementary school students after the fourth-grade, they will have more opportunities to handle a large messages and resources, if they can correctly and efficiently learn through reading and develop high-level thinking skills. Moreover, Chall (1996) proposed the developmental stage of reading ability, and the sixth grade students of elementary school correspond with the third stage, reading for the new, to absorb knowledge by reading. Students in the stage read more vocabularies and quickly accumulate a large of words to increase the prior knowledge. If the students failed to understand the reading content, they may reduce the opportunity to capture the new knowledge, and thereby affect learning academic performance.

Reading is one part of language learning. Arnold (2000) addressed that anxiety plays an important position in language learning. The research shows that the mild anxiety is able to stimulate learning. However, the high anxiety significantly reverses the learning, and interfere the thinking process of students.

Using music to relieve anxiety has been confirmed in areas of medical research, and the types of music include the classic music, the new century music, and the popular music (Cooke, Chaboyer, Schluter, & Hiratos, 2005; Lee, Henderson, & Shum, 2004). These studies have proved that the music has the effect of reducing anxiety and has an impact on learning. Rauscher et al. (1993) pointed out that

Mozart's music can briefly enhance students' spatial reasoning ability. Dosseville, Laborde, and Scelles (2012) found that the learning performance of the students by listening music was better than that of the students without listening to music. Therefore, reading with using background music to help learning may be an important factor. Based on those studies, the aim of this study is to explore the impact of using Mozart music for elementary school students' reading on the learning anxiety and reading comprehension.

2. Research Methods

2.1 Participants

In this study, 33 senior-grade students (19 males and 14 females) in elementary school in south Tainan were recruited to participant the learning task. The participants had no experience of reading the learning materials in the learning tasks, and some students had the learning disability or the students who did not finish the experimental procedure, their experimental data were invalid and were eliminated. Therefore, 31 experimental data were used for analysis, which included 18 males and 13 females.

2.2 Experimental tools

The learning materials were two articles in the format of Chinese expository prose from Taiwan government (MOE, 2011), and their titles were "The Glacier" and "The Rock Climbing". First article (The Glacier) with a total 1,206 words, the average words per sentence was 10.95 words, and the word frequency was 99.42% within the 5,021 Chinese common words which have been reported in an elementary school survey of common words (MOE, 2000). Second article (The Rock Climbing) with a total 1,199 words, the average words per sentence was 11.1 words, and the word frequency was 99.58% within the same set of common words. The use of an above level text was to ensure that students would read such a text were proper their word recognition ability, thus preventing a ceiling effect in word recognition for less or better readers.

After the end of each article, a test unit was used to test the reading comprehension of the article. Reading comprehension test of each article had a total score of 18 points, these two reading comprehension tests were used as experimental tools to measure students' reading comprehension. According to the item difficulty results of the two articles range from 0.6 to 0.7, means that the item difficulty level of the two articles is medium-easy.

This study used a scale of learning anxiety to analyze the learning anxiety of participants. We revised leaning anxiety scale according to the two previous studies (Venkatesh, 2000; He, Cheng, & Liu, 2010). The scale consisted of 8 items of question that were used to access the score of students' learning anxiety when they finished each reading task. Responses to all questions were on a four-point Likert-scale, from 4 for strongly agree to 1 for strongly disagree, thus the score range of learning anxiety that from 4 to 32 and a higher score means less learning anxiety of a student. The Cronbach's α of this scale was 0.91, indicating that the scale has a good internal consistency.

2.3 Experimental design and procedure

In this study, we used equivalent-time-sample design to investigate both the students' learning anxiety and reading comprehension after all participants completed the learning task. The learning task with the background music was assigned to use Mozart's Sonata for two pianos K.448, and another task having without the Mozart music was the "silent task". In other words, all the participants completed the first reading task about fifty minutes, including reading the article "The Glacier", took a learning anxiety scale and a reading comprehension test. A week later, the participants completed the second reading task also about fifty minutes, including reading the article "The Rock Climbing" with using Mozart Sonata as background music, took a learning anxiety scale and a reading comprehension test. The experimental design was shown in Table 1.

Table 1. Experimental design

Task	Test	Time interval	Task	Test
T_1	O_1	X	T_2	O_2

Note:
X : The interval time is a week
T_1: All participants read material (The Glacier) without Mozart music
T_2: All participants read material (The Rock Climbing) with Mozart music
O_1, O_2: Test (learning anxiety scale, reading comprehension test of each article)

Figure 1 shows that learning task in the experimental procedure. Figure 1a shows the students in a Chinese storybook learning task, and Figure 1b shows that the personal computer and speaker were used to play Mozart's Sonata for two pianos K.488.

a. Learning task   b. Play Mozart music

Figure 1. Experimental procedure

3. Results and discussion

At the beginning of the experiment, 31 students participated in the learning task, and their experimental data were used for analysis, which included 18 males and 13 females. The experimental results are shown in Tables 2 and 3.

As shown in Table 2, we found that no significant differences between two tasks on the score of students' learning anxiety. It appeared that the Mozart music didn't affect the students' learning anxiety in reading Chinese expository prose.

Table 2. The t-test results on learning anxiety

Music	Learning tasks			t	d
	N	M	SD		
Mozart music	31	25.23	4.92	.575	0.06
Silence	31	24.90	5.33		

Note: The "N" representation of the number of participants. "t" means the t-test value. "d" means the effect size. "M" means the mean value and "SD" means the standard deviation.

As shown in Table 3, similarly, we found that the reading comprehension score for the Mozart music task was significantly higher than that for the silent task. It appeared that the Mozart music has the impact on the students' reading comprehension when they read Chinese expository prose. These experimental values are similar to the previous study that Mozart music has an impact on students' learning (Rauscher et al, 1993).

Table 3. The t-test results on reading comprehension

Music	Learning tasks			t	d
	N	M	SD		
Mozart music	31	9.90	4.03	6.047[***]	0.88
Silence	31	6.65	3.36		

Note: [***]p <. 001, the "N" representation of the number of participants. "t" means the t-test value. "d" means the effect size. "M" means the mean value and "SD" means the standard deviation.

Based on our finding, we found that Mozart music can greatly enhance students' reading comprehension performance which is consistent with the findings of the past research (Rauscher et al., 1993). Although the learning anxiety in the two background music groups was not significantly different, the learning anxiety in the Mozart music group is lower than that in the silent group. The result of learning anxiety may be associated with the formal curriculum of the elementary school in Taiwan. The high grade students in elementary school had the experience of reading program for several years so that the two groups' learning anxiety about the reading Chinese storybook task presented little differently. Our study focused on investigating the relationship between the Mozart music and the reading task with learning anxiety and reading comprehension. The reading curriculum in elementary school contains not only reading task but also reading test. Therefore, the future research will consider using Mozart music in the reading test to understand the impact of music on students' test anxiety. We hope a series of studies about Mozart music can help understand the effect of music on students' reading when they receive different situational tasks.

4. Conclusions

In this study, we investigated how music-related factors (Mozart music and silent) affect learning anxiety and reading comprehension in reading Chinese storybook by using 31 elementary school students in the learning tasks. Based on the experimental results, The results show that Mozart music has an impact on the improvement of students' reading comprehension. However, we also found that the Mozart music couldn't reduced the students' learning anxiety in our study. Thus, we suggest that students can read Chinese storybooks with Mozart music to help them effectively acquire knowledge. The limitation of this study is a small of students in this experiment. In the future research, we will consider some experiments with a greater number of students, and conduct more complete research to investigate the relationships between e-books and Mozart music.

Acknowledgements

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