Research on Teaching Reform of Japanese Pronunciation Based on Voice Visualization Software— Taking Jingdezhen Ceramic Institute as an Example

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Abstract: With the teaching concept upgrading and teaching technologies development, the quality and quantity of Japanese teaching have been remarkably improved in in recent years in colleges and universities. The voice visualization software can make up for the deficiency of traditional pronunciation teaching and point out the pronunciation points clearly in the automatically generated spectrogram. The teaching practice in shows that Jingdezhen Ceramic Institute shows that the adoption of the voice visualization software can effectively enhance students' Japanese pronunciation score. We consider the test scores as the dependent variable y and the utility time of voice visualization software as the independent variable x. The polynomial fitting result of x and y is: $y = 2.1559x^2 - 2.8368x + 76.893$. The more time the student makes use of the voice visualization software, the good academic performance of Japanese pronunciation he will have under normal circumstances.

1. Concept and Advantages of Voice Visualization Software

Vision is the most efficient way for human to acquire information. The hearing sense is the following approach. Moreover, the information accessed by the combination of vision and hearing is more than the information accessed by the single sensory. The traditional pronunciation teaching only can let the student have the auditory perception, leading to an unsatisfied teaching effect. The basic function of voice visualization software is to annotate and analyse the speech signals. After recording the audio files with voice visualization software, a variety of language maps can be displayed according to requirements. It has great advantages in the voice assistant teaching, speech correction, speech autonomous learning. The voice visualization software can be downloaded free of charge. Compared with other commercial voice software, it has incomparable advantages.

Voice visualization software can complement the visual perception effectively. In terms of the vowels, when teaching the phonemes, the abstract pronunciation essentials and the similar pronunciation imitation are very difficult for students to learn. They cannot make the standard pronunciation and specify where the mistake is. The voice visualization software can provide a set of intuitive instructions through the analysis spectrogram of visual speech. The software is simple and convenient with the clear and accurate graphical feedback information. Therefore, it can be used as a wide range of voice analysis software for Japanese learners. After simple training, students can discover pronunciation problems and correct them by using their own software. Teachers can also put forward some specific solutions to improve the teaching effect and efficiency according to the results of students' pronunciation assessment by the voice visualization software.

2. Application Effects of Voice Visualization Software in Japanese Pronunciation Teaching

2.1 Comparison between the Class using Voice Visualization Software and the Traditional Class

We take the Japanese major students in Jingdezhen Ceramic Institute as the research object in this study. There are 29 students in class 1 of the Japanese major and there are 30 students in class 2 of the

Japanese major. We adopt the voice visualization software in class 1 and the traditional teaching mode in class 2 to teach the Japanese pronunciation. The learning process is pluralistic and the students' academic performance is influenced by many factors. We should ensure all the other conditions are same except the teaching model. The training program, teaching materials, teachers and the final exams are all the same in class 1 and class 2. The scores of the final examination of class 1 (using the voice visualization software) and class 2 (traditional model class) are shown in Table 1. The number represents the identification number of every student in each class.

Table 1. Japanese pronunciation scores of class 1 and class 2

Class 1		Class 2	
Number	Score	Number	Score
001	90	001	88
002	88	002	86
003	75	003	77
004	78	004	80
005	90	005	66
006	83	006	73
007	92	007	90
008	73	008	82
009	78	009	80
010	77	010	77
011	82	011	77
012	78	012	82
013	79	013	71
014	72	014	80
015	77	015	70
016	93	016	72
017	72	017	75
018	81	018	69
019	78	019	87
020	79	020	90
021	92	021	73
022	78	022	89
023	84	023	74
024	89	024	66
025	74	025	69
026	71	026	81
027	73	027	67
028	90	028	71
029	85	029	76
		030	76

We calculate the mean and standard deviation of the scores of class 1 and class 2. The results are shown in Table 2.

Table 2. Mean and standard deviation of scores in class 1 and class 2

	Class 1	Class 2
Mean	81.1	77.1
Standard Deviation	6.9	7.3

From Table 2, we can know that the mean score of the thirty students taught in the traditional

model in Class 2 is 77.1. However, the mean score of the twenty-nine students adopting the voice visualization software in Class 1 is 81.1. Obviously, the teaching performance using the voice visualization software is better than that of the traditional model. In terms of standard deviation, the standard deviation value using the voice visualization software is lower than that of the traditional class, which shows that the voice visualization software can effectively reduce the instability of the test scores.

2.2 Relationship between Score and Utility Time of Voice Visualization Software

Aimed at studying the relationship between the utility time of voice visualization software and the Japanese pronunciation scores, the author launched a relevant survey. We combine the utility time in every day and the final examination score to get the Table 3.

Table 3. The utility time of voice visualization software and Japanese pronunciation scores of every student

Class 1		
Number	Score	Time
001	90	2.5
002	88	3.0
003	75	0.8
004	78	2.5
005	90	1.7
006	83	2.9
007	92	3.0
008	73	0.5
009	78	0.5
010	77	0.7
011	82	2.0
012	78	1.1
013	79	1.2
014	72	2.5
015	77	1.9
016	93	2.9
017	72	1.3
018	81	2.5
019	78	2.2
020	79	0.9
021	92	3.5
022	78	1.5
023	84	2.0
024	89	3.0
025	74	0.5
026	71	2.3
027	73	1.5
028	90	2.5
029	85	2.5

We draw the scatter diagram of utility time of voice visualization software and Japanese pronunciation score of every student, and then do the polynomial fitting. The results are shown in Figure 1.

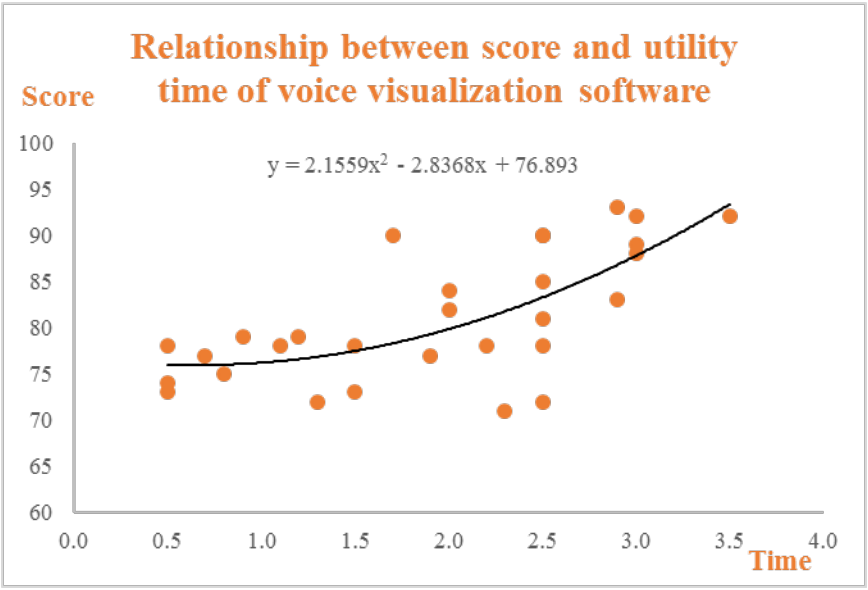

Figure 1. Relationship between score and utility time of voice visualization software

When we consider the test scores as the dependent variable y and the utility time of voice visualization software as the independent variable x. The polynomial relationship between x and y is:

$$y = 2.1559x^2 - 2.8368x + 76.893$$

According to the mathematical knowledge, in the interval of [0.66,+ ∞), the score of Japanese pronunciation will increase with the prolong of the utility time of voice visualization software in general.

That is to say, in the interval of [0.66,+ ∞), the more time to use the voice visualization software, the better test results will be obtained. As the 0.66 hour can be seen as the minimum utility time for students to use the software, we can say that the more time to use the voice visualization software, the good academic performance the students have under normal circumstances.

3. Conclusion

This paper explores the difficulties of Japanese pronunciation teaching and verifies the important role of the voice visualization software through empirical study. The adoption of the voice visualization software can effectively enhance students' Japanese pronunciation scores by making up the visual shortage of the traditional pronunciation teaching model. The teaching practice shows when the utility time of voice visualization software is in the interval of [0.66,+ ∞), the score of Japanese pronunciation will increase with the prolong of the utility time of voice visualization software in general.

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