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A SYSTEM FOR TRAINING ENGLISH ORAL REACTION – THE JUNIOR LEVEL OF TAIWAN ENGLISH QUALIFY

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Abstract. *For the human need of communication, the oral have displaced the body language. After a long time passed, the simple expression of vocabulary and tone evolved into a complicated language. Now, one quarter of the world's population use English language as the mother tongue. Researches show that Asian students who take an oral test expect the result to be very positive, when in actual practice the format poses a real difficulty. The report of the Language Training and Testing Center of Taiwan indicates the number of people who pass the oral examination are few than the others, and that the main factor in failing is in "answering the question", so training English oral reaction is an important issue. This study is based on a problem-posing approach. Through an interactive voice response system, the learner spends several minutes in practicing orally every day. Via implementing the proposed system, our oral reaction training will become more efficient.*

Keywords: English oral reaction

1. **Introduction.** According to the ETS (Educational Testing Service, U.S.A.), the report shows the test is too difficult, especial the oral examination [1]. Therefore, the oral training is an important issue.

There are some studies for improving oral ability as follows: Lee and Huang [7] applied fuzzy set theory to judge oral answer accurately. Parault and Parkinson [15] proposed that sound symbolism is a word property that influences the learning of unknown words. Hayes-Harb et al. [2] proposed the intelligibility data were also considered in relation to various temporal-acoustic properties of native English and Mandarin-accented English speech in effort to better understand the properties of speech that may contribute to the inter-language speech intelligibility benefit.

Therefore, in this study, we based on the problem-posing approach, action learning and interactive voice response to build up an oral reaction training system. Via this system, we can transfer the oral material into voice mail and store the reply message. When the reply message transferred to text, and then could automatically produce degree via our judgment system. By the judgment system for training, our oral reaction training will become more efficient.

2. **The Proposed System Architecture.** In this section, we present an oral reaction training system based on fuzzy inference, as shown in Figure 1.

There are five modules in this system, namely, material record module (MRM), access control module (ACM), voice transfer module (VTM), grade module (GM) and time control module (TCM).

The functions of these five modules are as follows:

(1) Teaching material record module (MRM) – MRM records the teaching material.

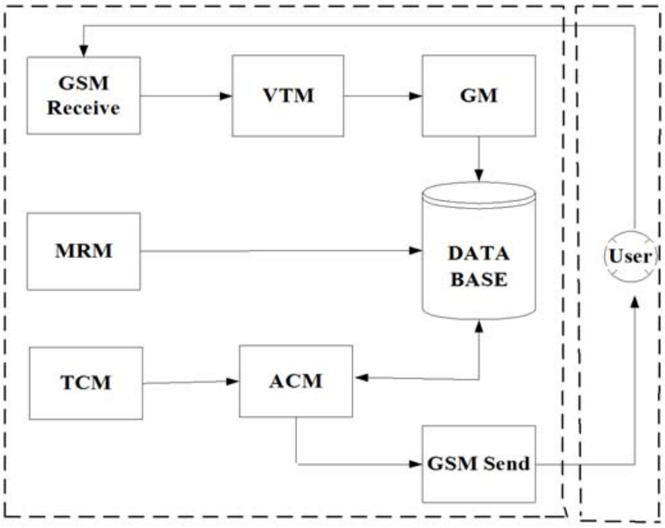

FIGURE 1. The architecture of the proposed system

(2) Access control module (ACM) – ACM transfers the teaching material record into the voice mail and send a short message to learner.

(3) Voice transfer module (VTM) – VTM f transfers the replying voice record to be text. Teacher depends on rules to inference the elementary vocabulary.

(4) Time control module (TCM) – TCM records time of transfer teaching material and time sent by short message service (SMS).

(5) Grade module (GM) – GM determines the situations of vocabulary by fuzzy inferences, and grades the text through the scoring system and records in the data.

3. **System Judging.** Oral exam adjusts standards based on fluency, comprehensibility and accuracy [3]. In this study, we focus on the accuracy of content as follows:

(1) Accuracy and appropriateness of content: if talking issues are closely interrelated to the content then it gets the point.

(2) Scoring standard: the closer interrelation between talking issues.

(3) Talking issues relation degree constructing method: in accordance with the database of the elementary talking issues of GEPT (General English Proficiency Test, Taiwan), expert who is professional in this field sets up the relation dimension between talking issues, such as, the relation degree of family with members of family is 1, but it will be different from the perception by different experts.

So the system adopts the fuzzy environment to run out the reasonable and more approximate to the actual result. Fuzzy set theory was introduced by Zadeh [18] to deal with problem in which vagueness is present, linguistic value can be used for approximate reasoning within the framework of fuzzy set theory [19] to effectively handle the ambiguity involved in the data evaluation and the vague property of linguistic expression, and normal triangular fuzzy numbers are used to characterize the fuzzy values of quantitative data and linguistic terms used in approximate reasoning.

With regard to fuzzy decision-making problem, Lee [4] applied fuzzy set theory to evaluate the aggregative risk in software development under fuzzy circumstances. Lin and Lee [9-11] presented facility site selection model using fuzzy set theory. Lin and Lee [12] presented a new fuzzy algorithm to evaluate the user satisfaction of software quality. Lin and Lee [13] presented the fuzzy assessment on sampling survey analysis. Lin and Lee [14] presented the two algorithms with the linear fuzzy linguistic for the group assessment.

The criteria ratings of relations between talking issues are linguistic variables with linguistic values $V_1, V_2, \ldots, V_5$, where V_1 = very high, V_2 = high, V_3 = middle, V_4 = low and V_5 = very low. The triangular fuzzy number representations of the linguistic values are shown in Table 1.

TABLE 1. Triangular fuzzy numbers of the criteria of relations

Rating of relation	*Triangular fuzzy number*
V_1: *very high*	$\tilde{V}_1 = \left(0, \frac{100}{6}, \frac{200}{6}\right)$
V_2: *high*	$\tilde{V}_2 = \left(\frac{100}{6}, \frac{200}{6}, \frac{300}{6}\right)$
V_3: *middle*	$\tilde{V}_3 = \left(\frac{200}{6}, \frac{300}{6}, \frac{400}{6}\right)$
V_4: *low*	$\tilde{V}_4 = \left(\frac{300}{6}, \frac{400}{6}, \frac{500}{6}\right)$
V_5: *very low*	$\tilde{V}_5 = \left(\frac{400}{6}, \frac{500}{6}, \frac{600}{6}\right)$

The membership functions that criteria rating of relations are shown in Figure 2.

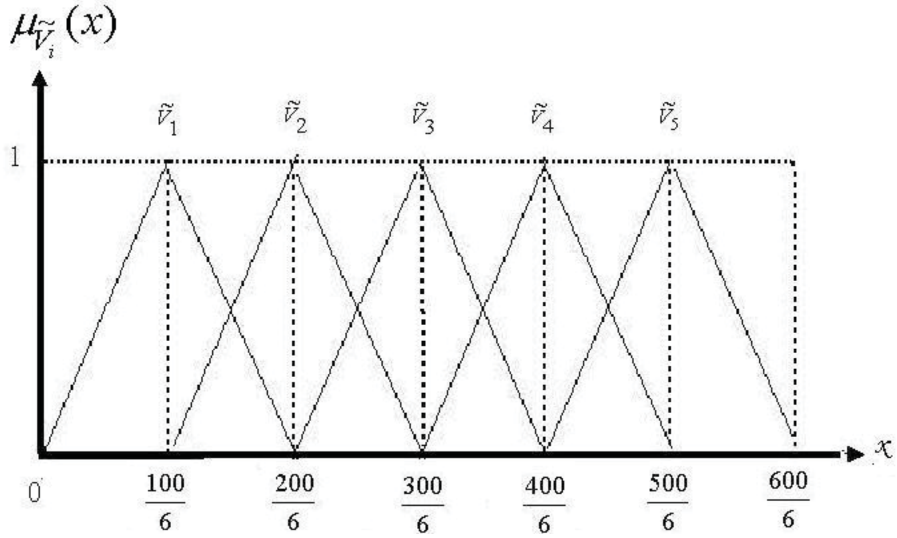

FIGURE 2. The membership functions that criteria rating of relations

The system sets up the relation degree from 0 to 1, and establishing five rules of fuzzy inferences are shown in Table 2.

TABLE 2. Rules of inference

Rule of number	*Relation*	*Relation degree*
1	*The relation of talking issues is very high*	*1*
2	*The relation of talking issues is high*	*0.75*
3	*The relation of talking issues is middle*	*0.5*
4	*The relation of talking issues is low*	*0.25*
5	*The relation of talking issues is very low*	*0*

4. **System Implementation.** In this section, we present the grade effectiveness analysis and actual experiment effectiveness analysis as follows:

(1) Analysis of grade effectiveness.

We invite English teacher to formulate twenty-five questions for a test, and to define the grade to three levels according to the difficulty. We also invite the other English teachers to define the relation degree between question and talking issues, and the score stander for our judgment system. The score stander range is the closed interval [0, 1]. Examples are shown in Table 3. Regarding an elementary grade class as the sample for the implementation, the system will mix the twenty-five questions with different levels, and examine each student five questions. Then we record the student's spoken answer on the recording device.

Table 3. The relation degree between talking issues

Talking issue number / *Question*	*I don't know*	*I take the bus*	*There are six people.*
Where do you live?	*0.25*	*0*	*0*
How do you go to school?	*0.25*	*1*	*0*
How many people are there in your family?	*0.25*	*0*	*1*

We transfer the recorded of spoken answer to text, and key in to the judgment system, the system will grade the text automatically according to the score stander. Examples are shown in Table 4.

Table 4. Recorded of spoken answer to text

Student number: RHQ008	
Question 1	*Who do you live with now?*
Answer	*My wife, my child*
Question 2	*How many languages do you speak? What are they?*
Answer	*Three, English, Taiwanese and Chinese*
Question 3	*What do you usually do in your free time?*
Answer	*Watching TV and using Internet*
Question 4	*What kinds of sports do you like? Why?*
Answer	*I like basketball and swimming, because it makes me health*
Question 5	*If you won lottery, what would you do?*
Answer	*I will be very very happy*

We invite English teachers to listen the recorder of spoken answers, and to grade the spoken answers by the content appropriateness.

In this research, in order to avoid the student knowing the questions affecting the examination results, we set the five questions promiscuous and averagely for each student. It is highest which appears frequency by the 4th question, the 15th question and the 22nd question in Level-1, Level-2 and Level-3 question banks. Therefore, we analyses the three question's record.

The results by statistics are as follows, Level-1: p (p-value) $= 0.044 < 0.05$ and Level-2: $P = 0.028 < 0.05$, the test showed the measure value's variance is very closely, there showed slight variation in the score between this system and the values given by teachers as shown in Tables 5 and 6.

Table 5. Level-1 correlations

			Q04H	*Q04M*
Spearman's rho	*Q04H*	*Correlation Coefficient*	*1.000*	*.889(*)*
		Sig. (2-tailed)	.	*.044*
		N	*5*	*5*
	Q04M	*Correlation Coefficient*	*.889(*)*	*1.000*
		Sig. (2-tailed)	*.044*	.
		N	*5*	*5*

* Correlation is significant at 0.05 Level.
(Q04H: Teacher grading of the 4th question,
Q04M: System grading of the 4th question)

Table 6. Level-2 correlations

			Q15H	*Q15M*
Spearman's rho	*Q15H*	*Correlation Coefficient*	*1.000*	*.723(*)*
		Sig. (2-tailed)	.	*.028*
		N	*9*	*9*
	Q15M	*Correlation Coefficient*	*.723(*)*	*1.000*
		Sig. (2-tailed)	*.028*	.
		N	*9*	*9*

* Correlation is significant at 0.05 Level.
(Q15H: Teacher graded of the 15th question,
Q15M: System graded of the 15th question)

From the results by statistics, Level-3: $P = 0.078 > 0.05$, the test showed the measure value's variance is not so closely as Level-1 and Level-2 as shown in Table 7.

Table 7. Level-3 correlations

			Q04H	*Q04M*
Spearman's rho	*Q22H*	*Correlation Coefficient*	*1.000*	*.704*
		Sig. (2-tailed)	.	*.078*
		N	*7*	*7*
	Q22M	*Correlation Coefficient*	*.704*	*1.000*
		Sig. (2-tailed)	*.078*	.
		N	*7*	*7*

* Correlation is significant at 0.05 Level.
(Q22H: Teacher graded of the 22nd question,
Q22M: System graded of the 22nd question)

(2) Actual experiment effectiveness

To assess the learning performance of the proposed oral reaction training system, this study recruited twenty-one freshmen that were majoring in the Department of Physical Education at Chinese Culture University. When they entranced into the university, they had to do an English examination to identify the ability of English, so we can make sure that all of they had failed in the elementary grade of GEPT.

The experiment's purpose is to verify whether the student's anxiety of English speaking has been improved or not. So, we will do oral anxiety pretest before the experiment. After we finished the experiment, we did a survey about student's anxiety of English speaking.

About the anxiety of English speaking, we focus on the twenty-one students and take two examines, one was before the oral training; the other was after the oral training.

According to the elementary speaking material of GEPT, we recorded thirty seconds voice file for the training material, the reference is shown in Table 8. The MRM functions of system record the teaching material that is shown in Figure 3.

TABLE 8. The example teaching material

Teaching Material	*Example*
1	*We all know one year has four seasons. There are Spring, Summer, Autumn and Winter. Please answer below question. What's your favorite season? Why do you like it?*
2	*We all know many transportation vehicles. Take a bus tools, ride a bicycle tool, walk tool, take a subway, ride a motorcycle tool. Please answer below question. How do you go to school?*

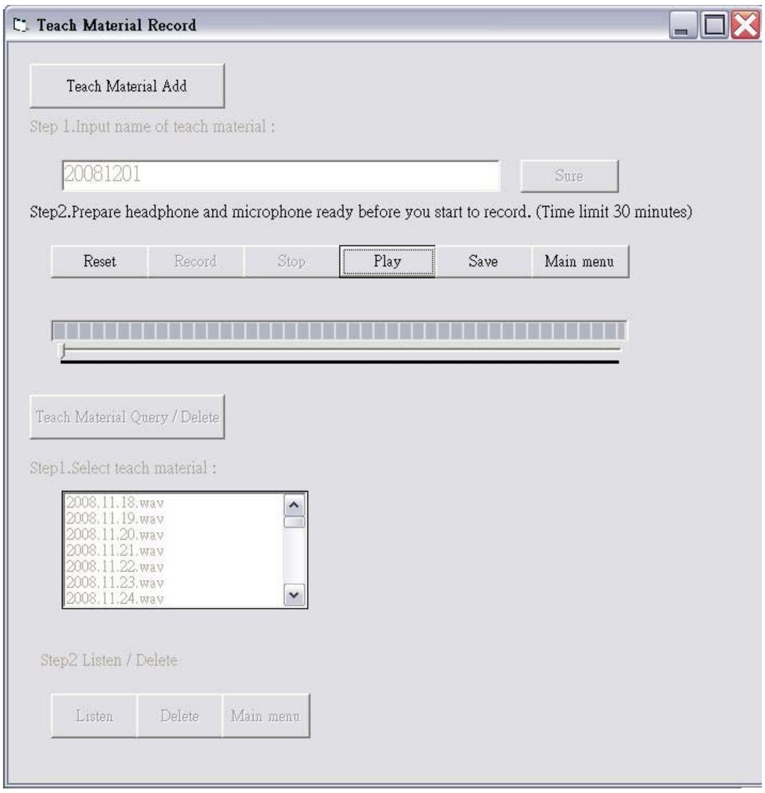

FIGURE 3. The MRM functions of system record the teaching material

In those thirty experiment days, we change the training material, which just spent thirty seconds, every day, and send a message to inform the statement of judgment to those students and to remind those students to listen the next training material. The ACM functions of system transferring the teaching material record into the voice mail and send a short message to learner that is shown in Figure 4.

The student can use his mobile phone to receive the SMS of system's judgment. Shown in Figure 5. When students receive the SMS, he will know how about his answer of the yesterday's question, and prepare to call the system's assigned phone number to listen the new question today.

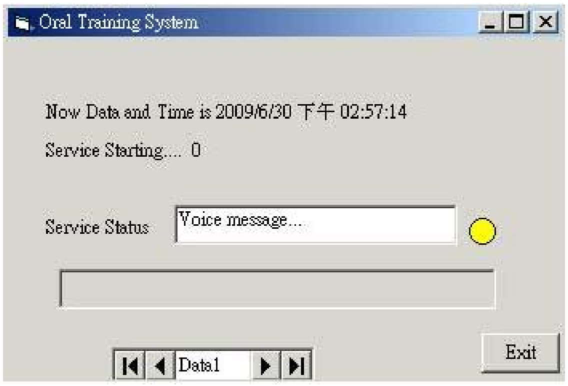

FIGURE 4. Voice message send

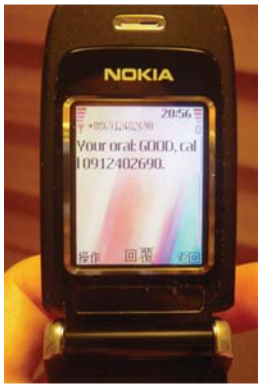

FIGURE 5. Voice receive SMS

The teacher can use the GM functions of system determining the situations of vocabulary by fuzzy inferences, and grades the text through the scoring system and records in the data is shown in Figure 6.

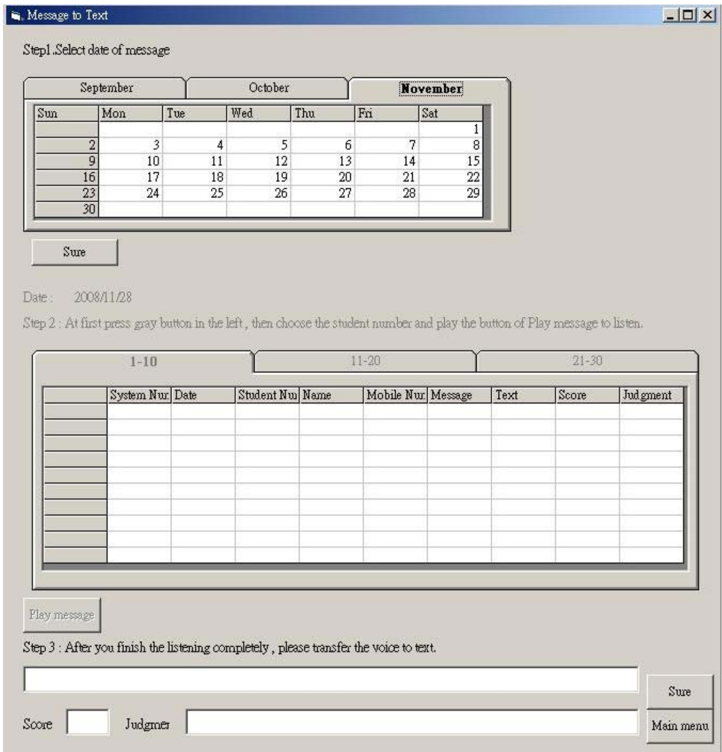

FIGURE 6. Voice message records

After we finished the experiment, we compared with statistic result which two times examines.

Depend on the result of statistics, pretest mean = 54.857, Std. deviation = 4.127, posttest Mean = 45.381, Std. deviation = 7.117, the test showed that the posttest's oral anxiety mean is low than the pretest's oral anxiety mean. Refer to the Table 9.

Depend on the result of statistics, Correlation = –.606, $P < 0.05$, the test showed that the pretest and posttest had obvious relation. Depend on the result of statistics, Mean = 9.33, t = –4.27, $P < 0.05$, the test showed the measure value's variance was large. The oral anxiety had obvious improvement. Refer to the Table 10.

Table 9. Paired samples statistics

		Mean	*Number*	*Standard deviation*	*Standard error mean*
Pair 1	*Pretest*	*54.8571*	*21*	*4.12657*	*.90049*
	Posttest	*45.3810*	*21*	*7.11671*	*1.55299*

Table 10. Paired samples test

		Paired Differences		*T*	*DF*	*Sig. (2-tailed)*
		Mean	*Std deviation*			
Pair 1	*Pretest and posttest*	*–9.47*	*10.16*	*–4.27*	*20*	*.000*

5. **Conclusions.** The proposed system for training English oral reaction of the junior level of Taiwan English qualify is very useful for improving the English oral reaction. Moreover, we made some comments about this system.

(1) The system judgment is more accurate on basic level (Level-1 and Level-2) than the others. Also, this useful system can promote learner's English interest to study, improve learner's English-speaking reaction ability effectively and help learners to pass the GEPT smoothly.

(2) Reduce the anxiety of English speaking. In this study, twenty-one of low English level students used the oral reaction training system for thirty days. After the training, the anxiety of English speaking average is lower than before. It proved the oral reaction training system to be helpful to reduce the anxiety of speaking English for the low level's students.

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