Answering Bee: A Pilot Study of Classroom Group Quiz Game

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Abstract: In this paper, the authors describe the group quiz game system, Answering Bee, which can be used in the classroom to explore the quiz game and its group learning interaction. Answering Bee system is available for four to six players for each group on the plate computer to have group quiz competition game. A pilot study adopted the quantity by the questionnaire of the learner pleasure was applied to understand the students' reaction and the system functions. Twenty senior high school freshmen are involved in this pilot study. The results indicate that the high interactive group students have the positive attitude toward concentration and social interaction when using the system but contrarily the high achievement group students get the positive attitude of the knowledge domain. Besides, the findings also figure out that the male is more acceptable than the female in the digital quiz game learning.

Keywords: Plate computer, group interaction, quiz game, assessment

Introduction

Using technology into the classroom is one of the current study issues, and it improves the current teaching model. Global alliance of one-to-one popularizes the conception of that every student has his/her own computer in the classroom [2]. The devices can connect to the Internet that can increase the students' right of access information and the interaction between teachers and students. The advantages of the mobile devices are innovative, portable, increasing the computing ability, durable and the high popular [5]. These advantages have affected the current situations in the classroom.

There are various activities in classroom, and assessment is one of the important items [1]. In the past, students took a test by using pens and papers. After finishing a test, teachers collected test papers and gave students the scores; students receive only the feedback, the score. However, score can't show what students have really learned. In addition, a large number of tests result in some pressure to students, and make students have low interest and motivation in learning and tests. Digital games have some characteristics of obvious goals, game rules, game condition, and entertainment [6]. These features engage a lot of students to spend ample time on gaming. This century is a "game generation" whose lives are already intervened by a lot of digital games. Therefore, how to combine assessments with games is an important guideline for research. Adopting game features in the tests may let the test become more interesting and improve the students' motivation for the test. Furthermore, teachers can access students' learning conditions by analyzing students' performance in the game, and to give appropriate scaffolding and support [4].

Assessment is an integral and ongoing means to find ways to improve learning and teaching and is the core body to assess need, measure growth and evaluate teachers, programs and curricula [8]. In this study, a group multiple choice game system named Answering Bee is

developed and used to explore the possibility of applying assessment to a game-based environment. By embedding the assessment into the group and competitive way to improve students' achievement [3], we can make it effectively and interesting to use the Answering Bee to be a tool of the assessment. Besides, by observing the process records and analyzing what students have participated in, we can find an appropriate way to suit to the learners to motivate and achieve students' performances.

1. Answering Bee System Design

1.1 User Interface Design

Figure 1 shows the Answering Bee system screenshots of which Figure 1-1 is the welcome screen, and Figure 1-2 is the player setting screen. There are two parts of the User Interface Design. The upper part of the screen (as the Figure1-3 & Figure1-4) shows the figure heads according to the numbers from one to six of logging in. Each figure represents an answering pupil. In front of each figure is a table to show the player's name and the start which symbols the code of answering each question. When the player gets the right answer, he/she gets one star; and vice versa, getting the wrong answer, he/she will be out of the game till accumulated three wrong answers.

| (1-1) | (1-2) |
| (1-3) | (1-4) |

Figure 1. Screenshots of Answering Bee System

The bottom part of the screen shows the question and its choices. The player can answer the questions by beating the choices. The right part of the bottom is the figure of the host with the facial expressions of joyful when the player gets the right answers to the questions and with the facial expression of disappointed when the player gets the wrong answers to the questions. The left part of the bottom part shows the facial expressions of the answering players with the happiness when having the right answers and with the annoyance when having the wrong ones. During the process, each one take turns answering the question. Three different of lights, brighter, shadow and black-and-white indicate the status of the players showing on the whole figure as the Figure 1-4. When the players are answering the

question, the figure shows brighter light; the left part of the bottom also shows the figure. While the player is off-line, the figure becomes the shadow color. And the loser will be showed by the black-and-white figure. The game will be lasted till all of the rest of the players are out till the last one, the survivor win the champion herein.

1.2 Game Flow and System Architecture

The game flow of Answering Bee composes of three steps. They are:
Step 1. Entering Game: Set the players number and enter the players' names and icons.
Step 2. Game Start: Every player owns three stars and takes turn answering the question by beating the Choices. When the player gets the wrong answer, he/she will lose one star. If the player gets the right answer, he/she will win one point per one question.
Step 3. Game Over: The game is lasting till the other players are out of the game; that is to say, he/she got the wrong answer accumulated three times. At last, the winner wins the champion because he gets the most right answers.

Figure 2 shows the five major parts of the Answering Bee. They are start game, ranking, setting, about us, and exit.
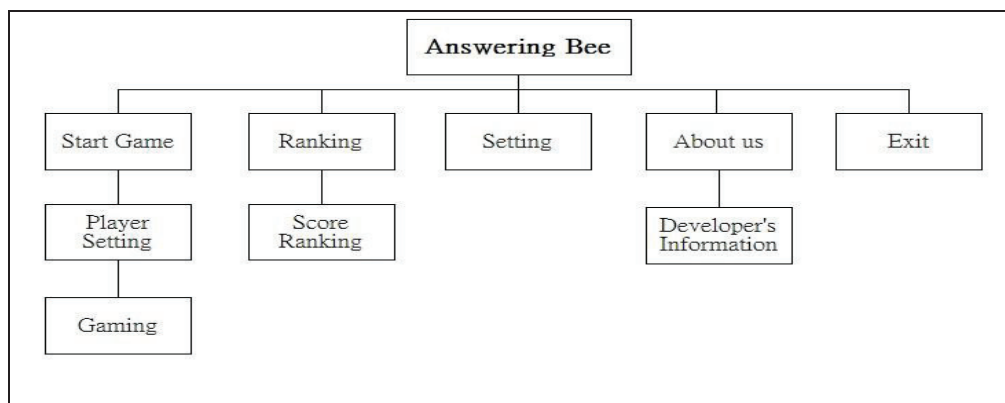

Figure 2. Answering Bee Framework Diagram

The details of the functions are elaborated below:
1. Start Game: Press the button "start" to enter the playing screen. And then set the number of players and each player's name, and choose the item bank.
2. Ranking: The ranking is recorded in the database based on all of the players. Whenever the game is over, the players' scores will be updated.
3. Setting: Teachers set the classes that are ready to play the games and questions in advance and students are open to select the item banks according to students' levels and preferences.
4. About Us: Some developers' information likes contacting ways.
5. Exit: Leave this system.

2. Pilot Study

For understanding students' reaction and system function, a pilot study was conducted. Twenty freshmen of Department of Computer Science at a vocational school in Chiayi County located in southern Taiwan were involved in this pilot study. Among them, twelve are male and eight are female. These students, aged sixteen, who are familiar with using

computers, not good at English, and low society background are the volunteers to be the participants and they are grouped to two according to their class performance and interactions by their English teacher who has taught them for one semester. A post-test pleasure questionnaire revised from Su (2006) was adopted. The Answering Bee system developed by our team was installed on two plate computers and applied for the pilot study, and one video recorder was used to tape the students' interactions.

2.1 Procedure

There were three steps in this practice, including "Warm Up," "Playing," and "After Activity." Below is the introduction of each step.

1. Warm Up: The participants are introduced how to use and practice the Answering Bee and are divided into the male (six ones) and the female (four ones).
2. Playing: These two groups play the Answering Bee system with two tablets simultaneously for two times.
3. After Activity: The players fill out the questionnaire.

This experiment is by convenience sampling and divided into two groups, one is high achievement and the other is high interactive; the former plays digital games is less than four times per month and for the average less than one year, and the later plays five to seven times per week for the average for three to five years.

2.2 Preliminary Results and Discussions

Some results were obtained by the questionnaires unfolded in six facets of the learner pleasure which are 1) concentrating, 2) feedback, 3) controlling the game, 4) immersing the game, 5) social interaction and 6) knowledge domain. This study uses five-item Likert-type scale that attempts to estimate the level of learner pleasure as the following: one point for very disagree, two points for disagree, three points for neutral, four points for agree, five points for very agree. The results indicate the positive values of Answering Bee, quiz game assessment as on the Table 1. The statements of the questionnaire are below:

There are two aspects have a remarkable result. The average scores of social interaction in high interaction group were 3.82 and higher than the group of high achievement (3.62). On the other hand, the average scores of knowledge domain in high achievement group were 3.82 and higher than the group of high interaction (3.66).

Table 1. The Results of the Questionnaire of the Learner Pleasure

Item	High Achievement	High Interaction
Concentrating	3.62	3.82
Feedback	3.90	3.97
Controlling the game	3.82	3.80
Social interaction	3.62	3.82
Immersing the game	3.64	3.68
Knowledge domain	3.82	3.66

Finally, the study analysis by the gender by T-Test and indicates that the male has more pleasures than the female no matter what he/she belongs to the high achievement or the high interactive one as the Table 2.

Table 2. T-test of Gender Differences in Two Groups

	Gender	Average	D	T	f	P
High Achievement	Male	4.12	.635	2.503	8	.037[*]
	Female	3.13	.560			
High Interaction	Male	3.95	.784	1.030	8	.333
	Female	3.51	.346			

p<.05

The questionnaire is to investigate the degree of the learning pleasure. Table 1 reveals several interesting issues of high interaction and high achievement, and gender differences. The results reveal that the high interaction students' concentration and social interaction were higher than the high achievement students, but the high achievement students had higher level of the knowledge domain than the high achievement students. The gender makes it different to play the quiz game and indicates that the male with a higher passion than the female.

3. Conclusions

The main purpose of Answering Bee is to alter the form of the assessment by groups to hope to decrease the defeats of the traditional tests and increase the features of the interactivity of the game-based learning. In the near future, the study plans to improve the feedback function to add more features into Answering Bee to make it more active and more fun. Furthermore, Answering Bee is not limited to English subject only, others subjects will be available. Besides, there are two aspects of the Answering Bee for the teachers and the learners. For the learners, this system will record their answering conditions in the database as to analyze their answering weaknesses as well to observe their learning achievements. For the teachers, teachers can realize what students have achieved and learned and then instruct the individualized learning according to each student's weakness and strengthens to motivate and achieve students' performance. Also, another system supplying teacher to add, delete and modify item bank on line will be constructed.

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