Module7 Research Article Summary

1.REFERENCE

A Surrogate Competition Approach to Enhancing Game-Based Learning

2. INTRODUCTION

Competition is an essential game element which emphasizes the process of social comparison where the student performance is exposed and compared. This exposure process sometimes opens students to hurtful or negative influences such as under confidence.

Various models were proposed to decrease these negative effects. Two such models are **anonymous competition** in which a scheme is provided to diminish negative impacts resulting from a face-to-face competitive context and the other model is **group competition**
in which competition is integrated into small group cooperative activities.

The present work proposes the concept of surrogative competition where there is no direct competition between individual students. In particular, each student player is allocated a substitute and the competition takes place between these substitutes. The present study tries to answer the question : "**What are the influences of surrogate competition on student learning in a game-based environment in terms of motivation, achievement, and belief?**" To address this question, two sub questions are invested by performing two experiments corresponding to each sub question respectively. Experiment One is primarily concerned with answering the first research subquestion : "How does surrogate competition affect students' learning motivation and learning achievement?". Experiment Two is concerned with answering the second research subquestion : "How does the surrogate affect students' views of the competition?"

Competition is regarded as a promising scheme for student learning. Two systems have been designed to help students master computational skills based on the popular Bingo and Mahjong games: EduBingo and AnswerMatching. As part of EduBingo game, students seek to answer questions faster than other peers in the domain of basic math which uses competition as part of a question-and-answer game. The results showed that most students improved their accuracy within the limited time provided for answering. As part of AnswerMatching game, students compete against peers who have been matched to have similar ability which applies competition to create an

equal-opportunity context. The results showed that students' perceived performance and self-efficacy were thus enhanced.

Researchers succeed in incorporating group structure with competition to support student learning. The Teams Games Tournament (TGT) allows students to work together as a learning group to compete against other groups. The Distributed WEST system allows students to compete against each other with the help of agents.

Recent studies show that the use of competition may also generate negative influences. Students' intrinsic motivation decreased while solving puzzles during competitions.To overcome this negative influence, the present work proposed the surrogative competition. When a surrogate mechanism is integrated within a competition, firstly it might increase the student's level of motivation and secondly, it might offer students more flexibility in developing positive beliefs on learning effort.

3. METHOD

EXPERIMENT ONE

Conditions

My-Pet-My-Arena Version 1

The My-Pet-My-Arena system consists of three related components. The first is a nurturing component which serves the purpose of developing students' attachment to their pets. The second component is the learning where the students demonstrate improved learning to earn "virtual coins" that allow them to buy food or medicine for the pets. At the same time, they may also obtain a higher "effort" value for the surrogate that will be used in the competition; this is accomplished through the third component—competition. The competition component is designed to promote students' positive belief in the role of effort in competition.

My-Pet-My-Arena Version 2

In addition to the learning, nurturing, and competition components of Version 1, an avatar component is used in the version-2.The component offers the function of customizable avatars to make the students feel that these avatars are representing them within the virtual world. This feature has been added to increase the engagement and feelings of being a master.

Participants

This study used a between-subjects quasi-experimental design with three elementary school classes randomly assigned to use one of the three systems. The number and gender proportion of participants in each class was similar.

Measures

Learning Systems: To address the first sub question, three versions of the learning system are used in this experiment. The first version (the control version, CG) presents learning materials only which has no creation or use of surrogates or competition The second version is the experimental My-Pet system (EG1), which is a subsystem of the My-Pet-My-Arena Version 1. The third version is the complete My-Pet-My-Arena Version 1 (EG2), which consists of learning material, My-Pet subsystem, and My-Arena subsystem.

Achievement Test: The achievement test consists of three parts: word-identification, word-sequencing, and idiom-apply, each having 20 questions.

Motivational Questionnaire: A questionnaire was used to collect data about the learners' experience in easy manner. The motivational questionnaire consisted of four subscales: Attention, Goal, Enjoyment, and Challenge and each subscale consisted of four items based on five-point Likert scales.

Procedure

Each group used four 30-minute sessions to learn Chinese idioms in a computer laboratory over a period of 5 weeks. The timing of these sessions (i.e., on which day and at what time during the day) was predetermined. The achievement test was conducted prior to the first session. At the end of these four sessions, the achievement test was immediately administered again as a posttest, and the motivational questionnaire was employed to collect student feedback.

EXPERIMENT TWO

Conditions

The first experiment only examined the benefits of surrogate competition in the learning environment. The second experiment investigates whether the surrogate competition would bring positive effects as direct competition while alleviating the negative effects.

Participants

This study used a between-subjects quasi-experimental design with three elementary school classes randomly assigned to use one of the three systems. The number and gender proportion of participants in each class was similar.

Measures

Two Different System Versions: Two systems were developed to address the second research question. The first was the My-Pet-My-Arena Version 2, which exemplifies surrogate competition in a way similar to what was done in Version 1 and the second system was the My-Competition system, which is similar to the other systems but implements a form of direct competition

Attribution Questions: Two attribution questions were used to contrast students' attributions concerning each intermediate outcome in two groups. Each question provided four options, and the participants chose the one reflecting their perceptions.

Procedure

Each group was given two 50-minute sessions to use the system over a period of 2weeks. At the beginning of the session, participants were told that they could use the system freely. During each session, each participant participated in the competition approximately 6 to 10 times to increase the validity of the collected data. After the competition, both groups were required to answer the attribution questions.

4. RESULTS AND DISCUSSION

EXPERIMENT ONE

The results revealed that the scores of the posttest were all higher than those of the pretest in the three groups. These results suggest that students' learning achievement was improved in all three versions of the system. The surrogate competition component invited the participants to observe and compare their learning progress against each other, which motivated them to make improvements

EXPERIMENT TWO

The results reveal that students in the CG tended to attribute their results toward effort made in improving learning, regardless of winning or losing. My-Competition system involved the representation of avatars to enhance their presence and participation

5. CONCLUSIONS

The first sub questions concludes that surrogate competition assists students in perceiving the sense of goal, enjoyment, and challenge and it also improves students' achievement. The second sub question concluded that the surrogate competition supports students' development of positive attitudes toward competition.

The results from this study also provide design implications in the area of computer-human interaction. Using others or virtual characters as surrogates improves interaction between individuals, which in turn reflects the significance of character-mediated communication.