On-line Assessment of Learner's Interest and Comprehension

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Introduction

Teachable agent (TA) is an effective way to motivate learners by involving learners in active teaching process (Kim et al., 2005). However, in order to enhance motivation and maintain interest more optimally, the learner's ongoing changes of interest and comprehension level should be assessed accurately and adaptive interface should be provided. This study demonstrates an example of on-line assessment of learner's interest and comprehension during interactive learning process.

Experiment

Method

87 fifth graders (48 males, 39 females) participated in the experiment. All participants were asked to fill in questionnaires of self-efficacy and mastery goal orientation. Then, participants were informed how to use TA program for 20 minutes and they were instructed to use TA program at least 20 minutes per day for ten days. During using TA program, participants taught an agent about 'rock and rock cycle', and the duration and frequency of learner's responses were collected. After the experiment, their level of interest and comprehension were measured. Participants were divided into four different groups depending on the sores of self-efficacy and mastery goal orientations (e.g., high self-efficacy and high mastery goal). Using collected log data, correlations between user responses and both interest and comprehension were explored by each group. Then, several responses highly correlated with both interest and comprehension were used as predictor variables of multiple regressions.

Results

As the result of multiple regressions, various responses from different groups were found to be good predictors of their interest and comprehension. Independent variables appeared in the order in which they were entered into the model.

In high mastery goal and high self-efficacy group, two independent variables such as frequency of reteaching, and frequency of responding correct answers significantly explained 32% of the variance in interest ($R^2=.32$, $F=6.07$, $p<.01$). In addition, three independent variables such as duration of using full map, frequency of putting in new concept, and frequency of logging in the program explained 40% of the variance in comprehension. In high mastery goal and low self-efficacy group, 53% of the variance in interest ($R^2=.53$, $F=5.72$, $p<.05$) and 68% of the variance in comprehension ($R^2=.68$, $F=10.69$, $p<.05$) were independently explained with two different independent variables. In high mastery goal and high self-efficacy group, one independent variable significantly explained 35% of the variance in interest ($R^2=.35$, $F=5.30$, $p<.05$), and one independent variable significantly explained 37% of the variance ($R^2=.37$, $F=5.80$, $p<.05$) in comprehension. Lastly, in low mastery goal and low self-efficacy group, the various independent variables significantly explained ($R^2=.58$, $F=2.29$, $p<.05$) 58% of the variance in interest, and 54% of the variance ($R^2=.54$, $F=6.41$, $p<.001$) in comprehension.

Conclusion

This study confirmed that learners' behavior patterns acquired from log data could be good predictors of learner's level of interest and comprehension in actual performance on KORI program. It is recommended to assess the changes on learner's interest and comprehension through the key behavioral indicators in real time so that adaptive interfaces for each learner can be provided to enhance their interest and comprehension.

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References

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