

Development and Evaluation of a Digital Vegetation Interaction Game for Children

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Abstract. In this study, we develop a new digital sugoroku game that portray the phenomenon of vegetation succession in a forest. The results of the experimental evaluation showed that the game was effective in stimulating the interest of the students who participated in the game.

Keywords: Interaction game, Digital sugoroku, Environmental learning, Vegetation succession

1 Introduction

In the field of science education, because Games can provide fun-fill learning environment, there is plenty of previous research on the subject of introducing digital games to support learning [1] [2]. In this study, we develop a new digital board game to support learning related to the phenomenon of vegetation succession, which can provide fun-fill learning environment regarding the complicated topics in the field of environmental learning.

2 Design and Development of the Vegetation Interaction Game

The vegetation succession game is a digital sugoroku board game that works with Adobe AIR (Adobe Integrated Runtime). We used Mt. Rokko located in the outer reaches of Kobe city in Japan, as a background for this game.

Figure 1 is the main window of the digital game. 6 pieces represent 6 characteristic plants that grow in the Mt. Rokko region. The surrounding part of the board is the grid area of the sugoroku board. In the central part, there is an event cards area a direction window to move pieces, and a visualization window to show vegetation succession according to the progress of the game. We set the event cards to correspond to the kinds of disturbances.



Fig. 1. Main window of sugoroku board

3 Evaluation of the Vegetation Interaction Game

To evaluate the effectiveness of the digital game in students' learning about the concept of vegetation succession in a joyful way, we conducted an experimental evaluation in a university in Japan. The subjects comprised 18 graduate and undergraduate students who don't major in botany.

A questionnaire survey including 4 items was conducted after the experiment. The subjects were asked to answer the questions using a 4-point scale that ranged from "I think so" to "I don't think so." It took about five minutes for each subject to answer the questions. The results show that for the item "I learned in a joyful way," the positive evaluation significantly outnumbered the negative ($p < .01$). Further, it was revealed that for the items of understanding of the disturbance, positive evaluations significantly outnumbered the negative ones ($p < .01$). These results show that this game was effective in supporting the students' interest and learning in a joyful way.

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