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Developing Digital Game Based on the Conception of Insects (DGBI) to Test Elementary Student's Insect Conceptions

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ABSTRACT
The purpose of this study is to promote elementary school student's conception and interest of insect. In this study, we device a digital game, which possessed scientific and fun, base on the conception of insects (DGBI), then can use it to test elementary school student's conception about insect.

The DGBI materials creating pattern use as the ADDIE model. First step is to analyze the DGBI materials. We analyze student's alternative conceptions of insect and what the teaching staff needs to teach in the section of insect, and then we develop three teaching units, namely the —Bugs Adventure‖, —Legs and Wings "and" Mouthparts and feeding habits‖.

Second, design the DGBI. Making DGBI has a clear teaching aim, multi-learning strategy like conception puzzle, computer simulation and conception mapping etc, an artistic and convenient operating media interface and a learning content that is easy to understand by the words and video in the DGBI materials.

Third, develop the DGBI. Developing DGBI includes making animation component and composing animation component, these animation components makes 94.4% of students prefer to use DGBI materials to learn the conceptions of insect, especially the constructional detail magnify function and interactive game design in the teaching materials increase the student's learning interest.

Forth, implement DGBI. We invite Two national college professors and four senior science teachers to use DGBI, and then we interview them to collect the testing amendments, and corrected it.Fifth, evaluate DGBI. We use quasi-experiment design and questionnaire survey to evaluate DGBI. In the quasi-experiment design, we select 111 students for four classes in an elementary school in New Taipei City and ask them to use DGBI, and then we tested them by the —Insects Conceptions test‖. We found that after using the DGBI materials, the student's post-test scores (13.64) is higher than the pre-test scores (7.55), and there are significant differences (t = 16.47,p = .00)and helps the student to establish the correct concept of insect.. In the questionnaire survey, we ask 6 elementary school teachers to write down the —digital materials quality certification evaluation form‖ after using DGBI. The teachers think that DGBI has an organizational integrity of the insect teaching material. When using DGBI, they can teach the insect unit as a game, and student can learn the insect unit on student's own initiative, which allows students to study the conceptions of insect step-by-step.

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