Improving Elementary Students' Environmental Education Using Dual Interactive Teaching Models

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Abstract: Learning from living with it's subtle and tine aspects are an important startup of Bionic Science in early child's education. Our research team tries to design and create an educational system to help students learning from nature to nature and explore the power of technology in everyday life. By exploring the theme of urban bugs' eco-development, characteristics, habits, and further convey the concept of prevention to personal health education. Our teaching kits has two highlight features, firstly, the high quality of 3D visual effects, and another is the application of Augmented Reality (AR) app to create the "Immersive" "Interactive" and "Imaginative" learning experience.

Keywords: eLearning, Science Education, Fire Ants, eBook, AR

1. Introduction

In this experimental project, we adopted "Fire ant's ecology journal" as our topic. The teaching model is exploring the bioscience content with an Augmented Reality (AR) app in their hand-held devices first and then read an interactive eBook individually before class. Students/ learners will explore, learn and discover more about Fire Ants in their own campus, which is called "Exploratory Process of Learning".

This teaching models provides; (1) a new interactive e-book with the high quality and unique 3D visual effects and voluntarily interactive learning systems to accomplish "Interactive electronic picture-book in hand-held device" (2) an uploaded app into App Store and make this educative information more popularized from providing this learning material for free in the future. (3) using animations to explain the abstract ecological ideas, and also make it easier for teachers to teach. (4) an unique learning experience for students by using up-to-date technology.

After interviewing with fire ant experts, the contents of interactive e-book content showed the first perspective view as students' to explore fire ants' ecological system. It contained the notion of eusocial insects, the way ants after giving birth; marriage phenomenon flying ants work division status, eating, and death so on interesting ecological phenomenon to introduce eco-ants.

2. Literature Review

2.1 The Flipped Classroom

The method of flipped classroom is inverted typical cycle of traditional teaching where students gain first exposure to new material before class. Students will take more responsibility for their own learning. Significant learning opportunities can be gained through facilitating active learning, engaging students, guiding learning, correcting misunderstandings and providing timely feedback using a variety of pedagogical strategies. Nowadays, this method has been extensive promoted globally and more

discusses have been proposed, such as Dr. Mariappan Jawaharlal who is a professor of Mechanical Engineering California State Polytechnic University, Pomona. He established that the key of making the teaching method successful is "IF students review the material before the class. This will happen only if the content is interesting." (Jawaharlal, 2015) He has been pointed out the dark side of fantasy, more and more teachers to produce a lot of teaching contents for flipped teaching method, indeed the quality and the pervious core content is being used or not that is difficult to proved. Therefore, how to design an interesting teaching material can be the further issue to new generation education.

2.2 The Flipped Flipped Classroom

In 2013, Graduate School of Education, GSE proposed the most recently studies about "Before reading or watching videos, students should experiment first". The researchers showed that when the order was reversed, students' performances improved substantially.

3. Result and Discussions

According to GSE's result, we have been tested our teaching kits in Partial township kids who were fifth grader elementary students as 28 participants. The lesson structure (Figure 1) were that, each participants have 20 minutes to pass and complete 5 questions in the campus by "FindAnts" app (Figure 2) firstly. Secondly, all of participants went through the Interactive eBook (Figure 3) to learn and find out the answers of those questions for another 20 minutes. Thirdly, participants shared their learning and discussed then with teachers in the classroom. So far the data is not big enough yet, it may be too soon to conclude it now. The further teaching program will continue for more partial township kids in Taiwan, and the learning outcomes of these new teaching set will build up for the further modification and product renewing.
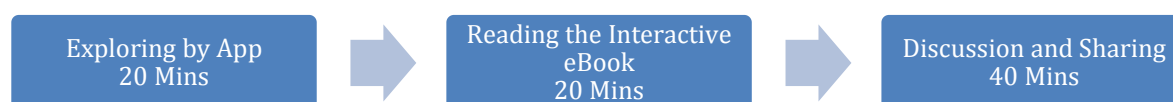
Exploring by App 20 Mins	→	Reading the Interactive eBook 20 Mins	→	Discussion and Sharing 40 Mins

Figure 1. The lesson structure for our teaching sets.

Figure 2. The icon image of App.

Figure 3. The cover image of eBooks.

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