

## *Augmented reality in primary science classroom*

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### **Abstract**

Teaching science in 1<sup>st</sup> grade students is a great experience, we both try to transfer science contents and also integrate some essential skill for using in class; writing and reading. Implementing Augmented Reality (AR) in science class is a lot of benefits, one important thing is making learners' experience more engaging. Two modules on living or nonliving things and ecosystem had been developed in our science AR classroom. The alphabet cards were used to be the tangible interactions by spelling the name of living or nonliving things and combine some to create their own ecosystem. Experiments were performed with local primary schools. Results suggest that AR is effective in maintaining high levels of motivation among children, and also has a positive impact on the students' writing, reading and science learning experience.

Keywords: Augmented reality, Tangible interfaces, Collaborative learning

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## Introduction

Teaching science in early primary school is one of the challenge work because we should let them understand the science content and let them read and write the science content that they have learn in the right way also. The new digital landscape in Thailand which is influencing and challenging conventional delivery modes in education. Augmented Reality (AR), is a live direct or indirect, view of a physical, real world environment by using computer generated sensory input such as sound, video, graphics or GPS data. Which is one of the newest technologies explored in edutainment, making learners' experience more "engaging".



Figure 1: Students can explore the meaning of the word by using AR application.

## Objectives

To find out the result of learning after using AR primary science classroom in the content of organism non-organism and ecosystem.

## Participants and course settings

A group of 25 first grade students from Ban Maad School, Ubon Ratchathani, Thailand took part in this study. During the first term of 2015. Chosen by the purposive sampling.

## Methodology

Researchers used Quai- Experimental Research which is one group pretest – Posttest Design (figure 2)

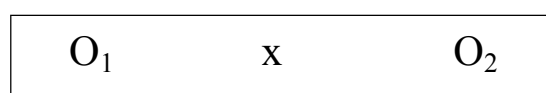


Figure 2: one Group pretest – Posttest Design.

The experiment was in the first term of year 2015 by starting the 1<sup>st</sup> week with the test of reading, writing and the content of organism non-organism and ecosystem by dictation, reading one by one with teacher and paper quiz. And start the 2<sup>nd</sup> – 4<sup>th</sup> week

with learning science content with AR by using their own tablet to identify the words that they created by spelling the alphabet and vowel cards (figure 3) and finding the word cards which the same meaning of the picture they painted in their ecosystem (figure 4). Then on 5<sup>th</sup> week we took a test of reading, writing and the content of organism non-organism and ecosystem by dictation, reading one by one with teacher and paper quiz again. Finally we surveyed of the parents' satisfaction feedback which using questionnaire in general questions to find out the motivation of learning in reading, writing and science content after their child learnt with AR, the questions associated with a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree'.



Figure 3: The words that students created by spelling the alphabet and vowel cards.



Figure 4: Students painted their own ecosystem and put the word which the same meaning of the picture they painted.

## **Research Findings**

During the class with AR, researcher found that students had more interested, more concentrate in the content and wanted to learn by using AR by themselves. They were happy and wanted to learn more about content of science with AR also. Our findings are supported by findings of other 3D IVR studies (e. g., Passig & Miler, 2014).

The improvement of writing and reading skill stem from the possibilities embedded within this technology which presents abstract concepts to a concrete, visual, three dimensional experience and directly meaning of the word. when analogies are presented to children by means which they are familiar with and which they think concretely significant; they deal with them successfully (Goswami, 1992; Halford, 1993).

## **Results**

AR is effective in maintaining high levels of motivation among children, and also has a positive impact on the students' writing, reading and science learning experience. Average score of reading skill before they used AR was 4.04 after the AR lesson their average score was 9.08, the average score of writing skill before they used AR was 3.76 after the AR lesson their average score was 9.12 and the average score of the science content before they used AR was 7.98 after the AR lesson their average score was 9.06. The parents' satisfaction feedback was the highest.

## **Conclusion**

Augmented reality is one of the tools that can engage kids to have more interesting in primary science content and reading and writing skill also. AR is effective in maintaining high levels of motivation among children and has a positive impact on the students' learning experience, especially among the weaker students. (Rubina, 2008). Some kids who wrote the general word correctly, tried to make new words after they finish the basic one such as they tried to spell the common name of fish not only write down the word "fish".

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