

Development Learning Achievement in Computer Subject Using Scratch Programming Language in Teaching Management for Pratom 6 students, Demonstration School, Suan Sunandha Rajabhat University

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ABSTRACT

Development learning achievement in computer subject by using Scratch Programming Language in learning management for Pratom 6 students, Demonstration School, Suan Sunandha Rajabhat University had an objective for developing learning achievement in computer subject by using Scratch Programming Language in learning management. The group of this research was Pratom 6 students in three classrooms, academic year 2018. The purposive sampling was used for selecting one classroom with twenty-six students as sample group. The data was analyzed by using average \bar{x} , standard deviation (SD), Efficiency of Process and Efficiency of Product E_1/E_2 as specified criterion at 80/80 and T-test for dependent sample for Scratch Programming Language lesson plan.

The research found that:

1) Efficiency of process in using Scratch Programming Language in learning activity, The Wolf, for Pratom 6 students, Demonstration School, Suan Sunandha Rajabhat University was 81.44/88.85 which was relevant to specified criterion as 80/80.

2) Effectiveness index in using Scratch Programming Language in learning activity for Pratom 6 students, Demonstration School, Suan Sunandha Rajabhat University was 3.62 for before learning and 8.69 for after learning which showed that the students gained knowledge and self-development. With the comparison of pre-test and post-test scoring, it found that post-test scoring was higher than pre-test scoring at .05 level of significance.

3) The result of analysis of satisfaction in learning activity, The Wolf, for Pratom 6 students, Demonstration School, Suan Sunandha Rajabhat University found that It encouraged the students' self-creativity. The menu and tools were easy to use. The classroom atmosphere was great and fun. The step-by-step activity could be applied to their daily life. Average \bar{x} index was in the highest at 4.827 and standard deviation in ability of using Scratch Programming Language was at 0.365.

Keywords: Learning achievement, Scratch programming language, Pratom 6 students, Demonstration School, Suan Sunandha Rajabhat University

INTRODUCTION

The current teaching concepts mix the basic knowledge and unique skills of children in order to make them become successful. Since students focus on innovative and critical thinking and instructors have integrated knowledge about subjects and keep developing media, education innovations must attract the students and make them involve with their surroundings. With computer graphic skills, animation programs are developed. The instructors must also use their knowledge and try to study complicated animations. To create animations for the children, simple principles and tools must be used.

On 31st January 2016, Barack Obama, the president of the United States of America, announced the Computer Science for All Project for providing opportunities to all American students to study Computer Science in order to develop the skills for being “creators” in the digital economy instead of only being consumers.

Obama mentioned that “Computer Science” will become basic skills for everyone. The U.S. government would provide the budget of 4 billion dollars in order to develop Computer Science teachings in schools and the supporting budget for the National Science Foundation (NSF) in order to develop courses and train Computer Science instructors. This project of the U.S. government was also significantly supported in the IT industry by the famous people such as Bill Gates, Mark Zuckerberg and Jack Dorsey who created posts to admire this. Big companies such as Apple, Microsoft, Google, Facebook, Salesforce and Qualcomm also joined the project (Source: Whitehouse Blog, Whitehouse). For teaching activities, the population consisted of three classes of Grade 6 students in the academic year of 2018. The data were collected from the sample group selected by the purposive sampling method. The sample group was a class with 26 students. The statistics for data analysis are average score, standard deviation (S.D.), equipment performance calculation (E1/E2) with the criteria of 80/80, learning plan performance analysis with Scratch program and t-test for dependent sample.

The independent variable is the teaching materials with the Scratch programming language. The dependent variable is the academic achievement in Computer subject. The hypothesis is that the students who learn from the teaching materials will have the post-test academic achievement higher than the pre-test academic achievement. Scratch refers to the Scratch programming language, which learners can simply create tasks in the form of blocks that are connected together in order to create codes for commanding the program to run according to the scripts and the program allow the learners to interact with animated characters and play creative games. Academic achievement refers the students’ scores from learning the skills and their knowledge and understandings from the pre- and post-course tests that were created by the instructor(s) and about the lessons with clear evaluation guidelines. Quality tools were created for the Grade 6 students to learn processes and cooperation skills and develop creative thinking skills by creating the animation, the wolf.

OBJECTIVE

1. To create the teaching materials for creating tasks from the application with Scratch programming language in order to produce the animation, the Wolf, by the Grade 6 students of the Demonstration School of Suan Sunandha Rajabhat University
2. To evaluate the students’ pre- and post-test academic achievements in Computer subject by using the programming language
3. To evaluate the students’ satisfactions towards the programming language

MATERIALS AND METHODS

1. The population consisted of the 78 Grade 6 students in the Demonstration School of Suan Sunandha Rajabhat University in the academic year of 2018 that could use Scratch programming language and had never used the programming language.
2. The samples included a class of 26 Grade 6 students in the school who were selected with the purposive sampling method.

RESULTS AND DISCUSSION

The Scratch programming language was used for teaching the students with the lessons. The analysis results were presented by the researcher(s), respectively.

Table 1: the analysis of the effectiveness of the learning plans using the Scratch programming language for creating the animation, the Wolf, with the criteria of 80/80 The effectiveness is 81.44/88.85

(n=26)

The number of the students	Process Effectiveness (E1)	Result Effectiveness (E2)
26	81.44	88.85

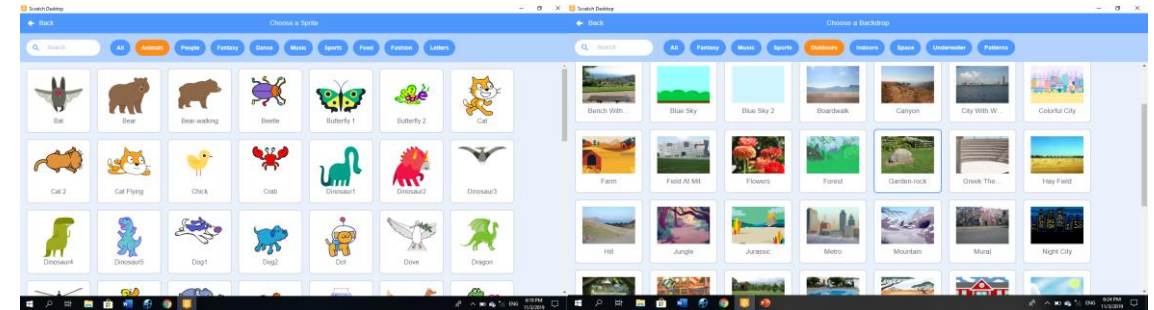
Table 2: the evaluation of the academic achievements in Computer subject of the Grade 6 students in the Demonstration School of Suan Sunandha Rajabhat University using the Scratch programming language. The students' pre- and post-course achievements are 3.62 and 8.69. By comparing their pre and post-test scores, the students' post-course scores are significantly higher than the pre-course scores at the significance level of .05

Test	\bar{X}	S.D.	\bar{D}	t
Pre-test	3.62	0.85	5.08	21.04*
Post-test	8.69	0.88		

Regarding the results from analyzing the satisfaction evaluation forms for using the Scratch programming language in the teaching activities, the mean and standard deviation of the programming skills are at the highest level ($\bar{X} = 4.827, SD = 0.365$). It is found that the behavior with the highest mean is the creative training for applications. Scratch is a teaching material with simple processes.

Figure 1

The researcher instructing and explaining the Grade 6 students in the Demonstration School of Suan Sunandha Rajabhat University about the menus and components for the Scratch programming language
Source: Computer Room No. 1635, 3rd Floor, the Demonstration School of Suan Sunandha Rajabhat University



Choose a sprite

backdrops



Code a sprite

Choose an extension

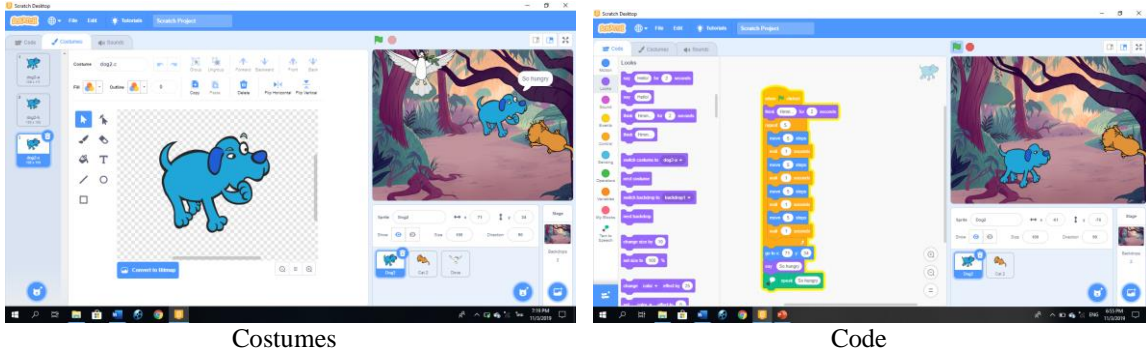
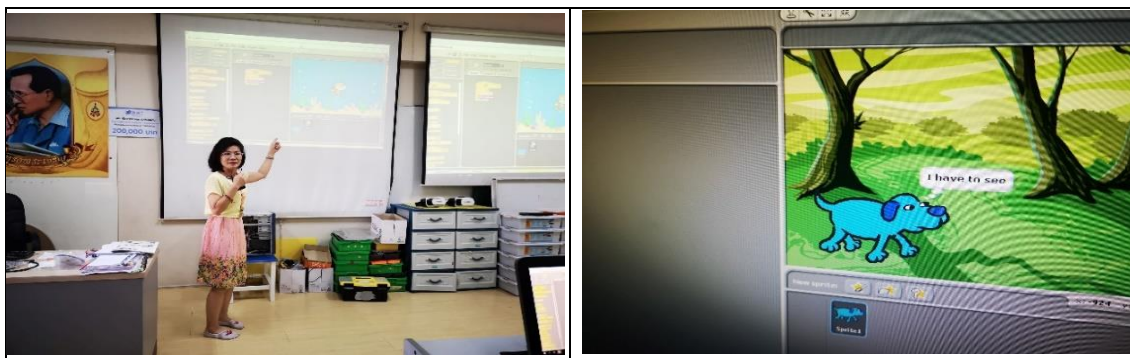


Figure 2

The students learning the Scratch programming language in a classroom of the Grade 6 students in the Demonstration School of Suan Sunandha Rajabhat University
Source: Computer Room No. 1635, 3rd Floor, the Demonstration School of Suan Sunandha Rajabhat University





CONCLUSION AND FUTURE WORK

It was found that the effectiveness of the teaching activities with the learning plans with the Scratch programming language in the forms of blocks in the lesson of creating tasks for the Grade 6 students in the Demonstration School of Suan Sunandha Rajabhat University was 81.44/ 88.85. This met the planned criteria, and the implementations were done according to the procedures and improved according to the expert(s)' suggestions.

The development of innovation management processes in the classroom In basic education institutions with quality management by Dr.Sudarat Srima (2012 : 149) Suan Sunandha Rajabhat University and Wassana Traiwattanathongchai (2000 : 3), who studied and developed the computer lessons that were modern and encouraged person centered learning with entertainment and excitements since the learners had to learn the computer lessons and then they would instantly know their progresses in order to develop their thinking skills, understandings and problem solving skills according to the National Education Act, B.E. 2542, which focuses on encouraging all learners to naturally learn and develop themselves with all of their abilities (The Office of the Education Reform Subcommittees. 2000 : 9)

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REFERENCES

- [1] Kidanan Malithong. 2000. Educational Technologies and Innovations. Bangkok: Audio Visual Education, Faculty of Education, Chulalongkorn University
- [2] Ministry of Education. (2008). The Basic Education Core Curriculum B.E. 2551 (Revised B.E. 2560) :the Manual for Learning Science, the Basic of Science and Technologies (Calculation Science) Technological Knowledge (Calculation Science)
- [3] Sudarat Srima and Watchara Sangkho.(2012 : 149) The development of innovation management processes in the classroom In basic education institutions with quality management , Suan Sunandha Rajabhat University
- [4] Supawan Lekwilai (1996 : 128) Wassana Traiwattanathongchai (2000 : 3). The Academic Achievements from Cooperative Learning with the Jigsaw Technique Affecting the Achievements and Attitudes towards Thai Subject of the Grade 6 Students in Ban Lat kachoe School (Kururatchoowit) Sakon Nakhon Graduate Education Journal, Sakon Nakhon Rajabhat University, Year: 9, Volume: 42, Pages: 163-171, Year: 2012
- [5] <https://scratch.mit.edu/> the document for the STEM Education with the Scratch Programming Language of TPST