# THE DEVELOPMENT OF LEARNING SCIENCE PRACTICAL PACKAGE WITH USING THE INQUIRY MODEL (5E) ON TOPIC OF SUBSTANCES AROUND US TO DEVELOP LEARNING ACHIEVEMENT IN SCIENCE SUBJECTS FOR GRADE 6 STUDENTS AT DEMONSTRATION SCHOOL OF SUAN SUNANDHA RAJABHAT UNIVERSITY

**Nungrutai Camhongsa***

*Demonstration School, Suan Sunandha Rajabhat University, Thailand
*Email: nungrutai.ca@ssru.ac.th*

## ABSTRACT

The purpose of this research were (1) to develop science learning practical package with using of the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students at Demonstration school of Suan Sunandha Rajabhat University to be effective according to the 80/80 criteria. (2) to compare the learning achievement pretest and posttest with practical package with using the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students. The sample group used in the research was 37 students in grade 6/1 of Suan Sunandha Rajabhat University Demonstration School, Semester 1, Academic Year 2023, which was obtained using the purposive selection method. The tools used in the research were (1) science learning practical package with using of the inquiry model (5E) on topic of substances around us. (2) learning Achievement test Basic statistics used in data analysis were the mean ($\bar{x}$), standard deviation (S.D.) and testing the hypothesis using dependent t-test.

The research results found that learning science practical package with using the inquiry model (5E) on topic of substances around us was developed with an efficiency of 83.25/83.75, higher than the criteria of 80/80. The learning achievement of students who studied learning science practical package with using the inquiry model (5E) on topic of substances around us for grade 6 students had a higher score posttest than pretest statistically significant at the .05 level.

**Keyword:** science learning activity set, inquiry method, academic outcomes

## INTRODUCTION

At present the world is changing and developing rapidly. In terms of economy, technology, communication, transportation, trade, and others, humans must adapt and develop into a population with the potential and quality to drive and develop the country further. It is important to prepare the new generation to have 21st Century Skills, including thinking skills, communication, collaboration, and creativity, as well as life and career skills. To be able to adapt to survive in a changing society which includes Having thinking skills, communication, cooperation, and creativity, including life and career skills. To be able to adapt to survive in a changing society, (Pornthip Siriphattharachai, 2561, page1) especially Development from upgrading Quality of education learning and development Preparation of the country in the field development of science Technology and innovation Focusing on supporting research and technology development Science is the culture of the modern world, which is a knowledge society which is in line with the Office of the Basic Education Commission, (2002) which has the aim of providing education to develop manpower in science and technology For self-reliance and increasing competency in international competition and creating a moral society. wisdom and learning (Ministry of Education,2560, page. 16) Analytical thinking is very important and useful in the

learning process. Because it helps students practice skills in various areas such as work skills, reading, writing, speaking, listening skills, communication skills, etc. It also helps students use reason to solve problems. think logically and is intelligent Because analytical thinking helps students develop their ability to learn throughout their lives.

Skill exercise books are a type of media that can be used to train students in scientific process skills. Because the training set allows students to study and research on their own. This allows students to practice additional activities after completing the content, students learn and able to develop scientific process skills as basic skills for living. It is also a basic skill for studying and gaining additional knowledge. And organizing learning activities using skill training kits is a type of technique that will help reform learning according to one's own interests. Do it yourself. until it can be summarized as new knowledge (Kaewudon Chuehan, 2545, page 3) corresponds to Moonkam & Moonkam (2002) that A skill exercise book is a type of teaching media that is a mixed media type and is the use of two or more types of media combined. It may be prepared for each unit of study according to the desired topics and experiences of each unit. Let students learn May be arranged as a set in a box. Consists of content, instructions, and worksheets for activities, corresponds to Thararat (2007) that skills exercise books are media or teaching innovations that help students learn by themselves. It creates skills in learning and seeking knowledge on one's own with teachers as advisors (Laiprasertporn N.& Youpensuk N, 2022) a study of science teaching using inquiry-based teaching was found to be a learning process that allows students to search for new knowledge on their own through the thinking process. and use the scientific process It is a tool for students to learn both in content and also develops thinking skills and student achievement to be higher.

Most teachers' teaching still uses themselves as the center for organizing teaching and learning activities. And having students carry out activities according to teachers' teachings causes problems in the quality of education, causing the need to change the learning process. If the teacher uses the traditional teaching style It may result in learners becoming bored. Don't understand the lesson Teaching to solve such problems. Organizing learning activities that help students could practice scientific process skills correctly is Students should be organized to participate in learning activities according to the scientific process as much as possible, starting from planning for learning management. hands-on practice Performance record Summary of work results and presentation of work as for teachers, they should play an important role in organizing activities by facilitating or encouraging students to truly learn the scientific process. In addition, a variety of learning activities should be organized corresponds to (Tisana Khaemmanee,2558, page. 141) organizing learning activities that emphasize the current inquiry process involves teachers organizing activities to stimulate students to ask questions. used the idea and take action to seek knowledge by yourself to bring to conclusions where the teacher is the facilitator for the students. Science is a subject that is quite difficult. Makes students not understand the content. Using skill training kits is another tool to help develop science process skills. Improve academic performance and stimulate students' excitement. Learning occurred very well. Because training allows students to practice This is because the training sets will help you practice frequently and repeatedly, resulting in durable learning. which follows Thorndike's law that practice often, it will lead to durable learning. It affects science teaching and higher ability to solve problems in daily life.

From the reasons mentioned above, the researcher There is an interest to do the development of learning science practical package with using the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students at Demonstration school of Suan Sunandha Rajabhat University, hoping to get an innovative training set that it is effective and can be used to develop student achievement in science subjects to a higher quality.

## RESEARCH OBJECTIVES

1. To develop science learning practical package with using of the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students at

Demonstration school of Suan Sunandha Rajabhat University to be effective according to the 80/80 criteria.

2. To compare the learning achievement pretest and posttest with practical package with using the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students.

## RESEARCH HYPOTHESIS

1. Science learning practical package with using of the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students at Demonstration school of Suan Sunandha Rajabhat University has efficiency according to the criteria of 80/80.

2. The learning achievement of students who learned with practical package with using of the inquiry model (5E) on topic of substances around us, posttest was significantly higher than pretest, with a statistical significance of .05.

## RESEARCH SCOPES

### 1. Population and sample group

1.1 population is grade 6 students at Demonstration School of Suan Sunandha Rajabhat University, Semester 1, Academic Year 2023, 2 classrooms, total 74 students.

1.2 The sample group was 37 students in Grade 6/1 of Demonstration School of Suan Sunandha Rajabhat University, Semester 1, Academic Year 2023, selected by purposive sampling.

### 2. Scope of variables

2.1 The independent variable is a science practical package with using of the inquiry model (5E) on topic of substances around us.

2.2 The dependent variable is the learning achievement of students who studied with the science learning practical package with using of the inquiry model (5E) on topic of substances around us.

## RESEARCH METHODS

Science learning practical package with using of the inquiry model (5E) on topic of substances around us. Using a single group study design with pretest and posttest (The One-Group Pretest-Posttest Design) with the following research tools.

### 1. The tools used in the research include:

1.1. Science learning skills training set combined with the use of the inquiry model (5E) on substances around us.

1.2. Lesson plan Science subject Learning unit on substances around us, looking for content validity and index of consistency (IOC)

### 2. Tools used to collect data include:

Learning achievement test on Surrounding Substances is a multiple-choice test with 4 options, 40 questions, to be given to Grade 6 students to use in pretest and posttest learning achievement tests by using a science learning practical package with using of the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students.

**3. Data collection**

3.1 Pretest using learning achievement test created by the researcher.

3.1.1 Teach with a science learning practical package with using of the inquiry model (5E) on topic of substances around us to develop learning achievement in science subjects for grade 6 students then students proceed with the learning activities and complete the test at the end of the book.

3.1.2 Take the scores of all students from the test at the end of the skill training set and find the average. and calculate the percentage from the total score This is the efficiency of the process (E1) of the science learning practical package with the use of the knowledge inquiry model (5E) on substances around us that the researcher has developed.

3.1.3 When students have completed the science learning practical package with using of the inquiry model (5E) on topic of substances around us, students will take a test to measure learning achievement on the topic of substances around us (multiple choice). 40 questions

3.1.4 Took scores from the learning achievement test on substances around us (multiple choice) with 40 questions were examined to find the average and calculate percentages from the full score. This is the efficiency (E2) of the science learning practical package combined with the use of the knowledge inquiry model (5E) on substances around us that the researcher has developed.

3.2 Comparison of learning achievement pretest and posttest study with the science learning practical package combined with using the knowledge inquiry model (5E) on the topic of substances around us. Take the scores obtained from the before and after tests. The experiment was used to calculate the average and standard deviation Test the difference between the average scores after studying and before studying. Using t-test statistics (Dependent Samples)

**4. Data analysis**

4.1 Analyze the effectiveness of the science learning practical package combined with using the knowledge inquiry model (5E) on the topic of substances around us of Grade 6 students to find the specified criteria of 80/80 using the formula E1. /E2 Statistics used are average percentage.

4.2 Analyze differences between pre-test and post-test scores using t-test (Dependent Samples).

4.3 Analyze the effectiveness of the 40 items learning achievement test by Analyze the difficulty and power values classified by item.

## RESEARCH RESULTS

The results of the efficiency analysis (E1 / E2 ) of the science learning skills training set combined with the use of the inquiry model (5 E) on the topic of surrounding substances for Grade 6 students according to the 80/80 criteria. It was found that the students took a post-test with the science learning practical package combined with using the knowledge inquiry model (5E) on the topic of substances around us and received an average score of 33.30 out of a total of 40 points, calculated as a percentage (E1 ) 83.25 and the learning achievement test on substances around us (multiple choice), 40 questions, received an average score of 33.50 out of a total of 40 points, calculated as a percentage (E2) 83.75. The efficiency of the science learning practical package combined with using the knowledge

inquiry model (5E) on the topic of substances around us for Grade 6 students is higher than the specified standard of 80/80.

The results of the analysis of learning achievement comparing pretest and posttest using the science learning practical package combined with using the knowledge inquiry model (5E) on the topic of substances around us in grade 6 are shown as follows table 1.

**Table 1 Analysis of academic achievement comparing pretest and posttest.**

| Test | N | $\bar{x}$ | S. D | t | sig |
|---|---|---|---|---|---|
| Pretest | 37 | 23.40 | 4.15 | 19.75 | .00 |
| Posttest | 37 | 34.33 | 2.42 | | |

The level of statistical significance at the .05 level

From Table 1, it was found that students who studied with the science learning practical package combined with using the knowledge inquiry model (5E) on the topic of substances around us had higher academic achievement after studying than before. With statistical significance at the .05 level, the mean pretest was 23.40, standard deviation was 4.15, and the mean score posttest was 34.33, standard deviation was 2.42, respectively.

## DISCUSSION OF RESEARCH RESULTS

The purpose of this study was to investigate the effectiveness of a science learning skill training set combined with the inquiry model (5E) on the topic of substances around us in improving the academic performance of Grade 6 students in science subjects. The results showed that the use of this training set was beneficial, and there were several discussion points raised during the study for Grade 6 students had an efficiency of 83.25/83.75. This means that students received an average score after studying using the science learning skill training set together with using the inquiry model (5E) on the subject of substances around them. They received an average score of 33.30 out of a full score of 40 points, calculated as a percentage (E1) 83.25 and the learning achievement test on substances around us (multiple choice) with 40 questions received an average score of 33.50 out of a total of 40 points, calculated as a percentage (E2) 83.75, the efficiency of the collaborative science learning skill training set. with the use of the knowledge inquiry model (5E) on substances around us Grade 6 students, higher than the standard 80/80 set, consistent with the research of Suchada Phorchaiyarat (2015: 61) that conducted a study on the Development of academic achievement and analytical thinking ability of grade 10 students on the topic of inheritance of genetic characteristics through scientific inquiry learning. The results of the study found that Efficiency of the process and post-learning achievement of the learning management plan. The average value was 83.25/83.75 meeting the standard criteria of 80/80 percent.

Comparison of pre-study and post-study academic achievement using a science learning skill training set combined with the use of inquiry formats. Knowledge (5E) about substances around us of students in Grade 6. The mean score before the study was 23.40, the standard deviation was 4.15, and the mean score after the study was 34.33, the standard deviation is 2.42, indicating that students' Academic achievement after studying was significantly higher than before studying at the .05 level, line with the set assumptions. This is due to the said learning skill training set. has developed as a process that Contains content that is difficult and suitable for Grade 6 and can be applied in everyday life. This is consistent with the research of Naphatthon Buachun and Supattra Thanomwong (2016, pp. 157-166) who conducted a comparative study of academic achievement in science learning. Using exercises to enhance skills on force and movement. of grade 7 students, it was found that the academic achievement in science subject matter force and motion of students in Year 1 of secondary school after studying with skill-enhancing exercises Higher than before studying with statistical significance at the 0.05 level.

## RECOMMENDATIONS

**Recommendations for applying the research results**

1. Teachers should understand the teaching method according to the inquiry process (5E). Study the manual of the learning skills training set. To be able to explain to students clearly.

2. Setting the time for organizing activities is very important. This is because some activities require practice and searching for information. Teachers must manage their time well so that they can continue teaching.

**Recommendations for further research**

1. This research model should be used. to use in research using other content at other grade levels as appropriate.

2. There should be a design to bring in other learning formats. together with a skills training set to develop all-round process skills


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