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ตามที่ท่านได้ส่งบทความวิจัย เรื่อง “The Integration of King Rama IX’s Philosophy and characteristics of 21 st-century youth to Improve Undergraduates Majoring in Teaching Science” ในงานการประชุมวิชาการระดับชาติและนานาชาติ “ราชภัฏวิจัย ครั้งที่ ๖ ราชภัฏ ราชภัคดี: สืบสานศาสตร์ พระราชาสู่การพัฒนาท้องถิ่นอย่างยั่งยืน” The 6<sup>th</sup> Rajabhat University National and International Research & Academic Conference (RUNIRAC VI) นั้น

ในการนี้ มหาวิทยาลัยราชภัฏจันทรเกษม จึงขอตอบรับการเข้าร่วมงานราชภัฏวิจัย ครั้งที่ ๖ และขอให้ท่านมานำเสนอบทความวิจัยดังกล่าว ระหว่างวันที่ ๑๗ - ๑๘ สิงหาคม ๒๕๖๓ ในรูปแบบออนไลน์  
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ผู้อำนวยการสถาบันวิจัยและพัฒนา ปฏิบัติราชการแทน  
อธิการบดีมหาวิทยาลัยราชภัฏจันทรเกษม

สถาบันวิจัยและพัฒนา

โทรศัพท์ ๐ ๒๙๔๒ ๖๘๐๐ ต่อ ๙๐๐๑-๙๐๐๙

The Integration of King Rama IX's Philosophy and Characteristics of 21<sup>st</sup>-century youth to  
Improve Undergraduates Majoring in Teaching Science

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### Abstract

The objectives of this research were 1) to enhance students' understanding of Local Science subject through instructional design activity; 2) to improve students' integration skills; 3) to investigate students' satisfaction toward instructional design of Local Science subject. The samples of this research, selected by purposive sampling method, were 54 General Science major sophomores, Faculty of Education, Kamphaeng Phet Rajabhat University. The research instruments were the handouts of Local Science subject, questionnaires asking for understanding contents on Local Science subject, lessons and learning activities evaluation forms, and activities satisfaction questionnaires.

Significantly, the results indicated that the levels of knowledge of the samples after participating in Activity-Based Learning Model of Local Science subject were at a high level ( $\bar{X} = 4.12$ ,  $SD = 0.03$ ). The results of questionnaires asking for understanding contents collecting at the end of the research ( $\bar{X} = 4.23$ ,  $SD = 0.67$ ) were higher than those of the questionnaires collecting at the beginning ( $\bar{X} = 3.62$ ,  $SD = 0.87$ ). The samples developed instructional design and learning activity management system for Local Science subject in groups. After that, they were evaluated and the results showed that their scores were in the range of 33 – 39.5 out of 50 which were 70-79% and were at good and excellent levels. Besides, they were able to design Local Science lessons, arrange school activities, make videos in order to present local wisdom. The samples' satisfaction toward Activity-Based Learning Model according to learning style, learning process and procedure, the stage of teaching (instruction and training) and the stage of activities planning was at a high level.

**Keywords:** Characteristics of 21<sup>st</sup>-century youth, integration, King Rama IX's Philosophy, Undergraduates Majoring in Teaching Science

## 1. Introduction

H.M. King Bhumibol Adulyadej developed and bestowed the philosophy for anyone who would like to apply the philosophy to their utilization especially for Education. Firstly, Educational Institute Development, there was the integration of 'Philosophy of sufficiency Economy' and other aspects of 'The King's Philosophy to curriculum development and the development of instructional model. Secondly, Teacher Professional Development, there were the development on professional ethics for teachers, the development of teaching techniques and the development of educational media innovation. Thirdly, Learner Development, students were promoted to acquire knowledge, to improve their thinking skills, and to be able to work critically which could result in promoting students' interpersonal skills and ability to live with others. (Solkosoon and Pothisaan, 2018)

Nowadays, instructional model should be created to promote self-directed learning through applying Learning by doing and Active learning approaches to instruction. Learners would be promoted to learn to do everything, in the classroom, by themselves and acquire knowledge or skills through direct experiences and environment by carrying out their tasks. Learning in this way could also help improve their thinking skills and they could learn to handle every circumstances happened in the classroom by themselves which could be defined as the

ways of students-centered style of learning. In addition, teachers can add and apply 21<sup>st</sup>-century skills including learning and innovation skills, life and career skills and information, media and technology skills in classroom activities. Active learning, moreover, helps learners develop their analytical and synthetic thinking and they will eventually be able to evaluate information from any new circumstances. It encourages students' motivation and lifelong learning skills which drive them eager to learn habitually. (Pakdeejit, 2014) According to 21<sup>st</sup> century education, there are some challenges for preparing students for 21<sup>st</sup> century survival which is an important social changing trend in this era. It affects living in modern society thoroughly so teachers should create a suitable instructional model which could assist improve our students' life skills by promoting learning skills that can strengthen students' knowledge, abilities, and essential skills. As Vicharn Panich (2012) mentioned that instructional models should be improved in order to encourage effective and lifelong learning and they should consist of modern and effective aspects for promoting students' learning. For instance, Sripatum University refers this as Activity Based Learning, can be defined as an instructional model emphasized on developing learning through various types of classroom activities and practices which are suitable for each subject. Project Based Learning, Problem Based Learning, Experiential Learning, and Work Integrated Learning are included as well.

According to the article "Enhancing Learning Skills of Learners in 21<sup>st</sup> Century Through Outdoor Education" by Oranuch Lintasiri (2017), outdoor education helps enhance learners' classroom learning experiences that influences and promotes students to gain more knowledge, understanding, and skills and also promotes good attitudes and awareness of environment. Besides, outdoor education is interdisciplinary which integrates many sciences for enhancing learning experiences and improving essential skills including observation, questioning, critical thinking, problem solving, communication, collaboration, and creative thinking. It also helps encourage learning experiences and higher-order thinking skills which are referred as a major concept of learning and living in 21<sup>st</sup> century. In addition, outdoor education promotes learning motivation and instills good manner of lifelong learners.

Also, Kamphaeng Phet Rajabhat University is responsible for strengthening local communities especially producing and training teachers and educational personnel. With good morality, quality, and national and international standards, the university still produces graduates with knowledge, skills, and abilities of critical thinking, problem solving, creativity, and communication. Using Activity Based learning as an outdoor education in Local Science subject with science-major undergraduates could help them understand the contents better and they would be able to integrate knowledge they learn to create lesson plans and classroom activities for Local Science subject and they could hold activities responding to local community needs.

## 2. Objectives

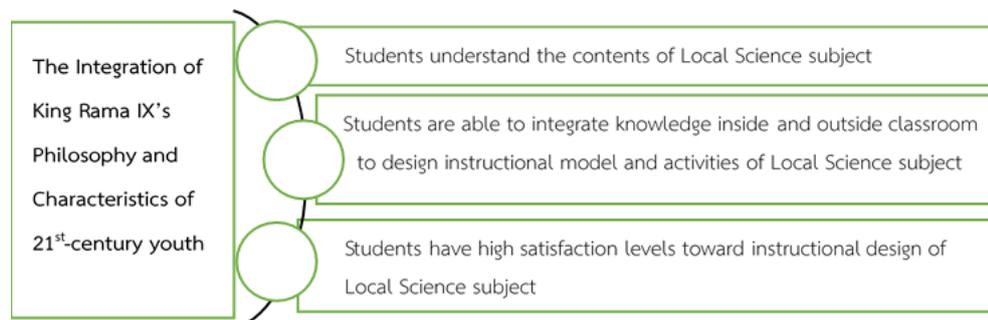
This research declares the objectives as follows:

- 1) To enhance students' understanding of Local Science subject through instructional design activity
- 2) To improve students' integration skills by integrating knowledge in the classroom and knowledge outside the classroom to design instructional model and activities of Local Science subject in order to serve school demand
- 3) To investigate students' satisfaction toward instructional design of Local Science subject

### 3. Scope of research

The scope area was in Kamphaeng Phet Rajabhat University and Nakorn Chum, Kamphaeng Phet. The scope of content was to study and analyze the context of local learning resources, to study body of knowledge or any knowledge which were cooperated with local sectors including teachers, students, local philosophers and/or local Administration Organization, to gather information and to design plans, to follow the plans, to evaluate, analyze and make conclusion, to design instructional model of Local Science subject, to pilot the designed instructional model, to evaluate and improve the instructional model until gaining the completed instructional model. The samples of this research were 54 General Science major sophomores, Faculty of Education, Kamphaeng Phet Rajabhat University.

### 4. Conceptual framework of research



#### Research Instruments and Research Instruments Efficiency

##### Research Instruments

1. the handouts of Local Science subject
2. Local Science Lesson Plans
3. pre-tests and post-tests on Local Science subject
4. activities satisfaction questionnaires.

##### Research Instruments development and Evaluation

1. The handouts of Local Science subject were evaluated by 3 specialists consisting of 8 lessons: lesson 1 Local Science, Lesson 2 Local Wisdom, Lesson 3 Learning Enquiry, Lesson 4 Study and Analyze the context of local learning resources, Lesson 5 Planning and Field Work Studying of Local Wisdom, Lesson 6 Designing lesson plans and Evaluating efficiency of lesson plans of Local Science subject, Lesson 7 Knowledge Management and Utilization from Local Wisdom, and Lesson 8 Designing Innovation from Local Wisdom.

2. The handouts of Local Science subject were designed according to the model of Jittrakarn Ekkamolkul (2006) as follows:

1. The Basic Education Core Curriculum
2. For the process of curriculum analysis, there was the analysis of elements and content structures and appropriate teaching time range in order to evaluate the contents of the subject and to suitably order innovation presentation. Learner analysis was done to examine various types of learner characteristic and to identify learning objectives.
3. There were the design and creating lesson plans focusing on topics and contents for each lesson, teaching hours, and methods and classroom activities used in each lesson.

4. Lesson plans were consisted of:

4.1 Subject grouping, school levels, topics, teaching hours, contents, expected learning outcomes, terminal objectives, enabling objectives, teaching process, pre-teaching activities, learning activities, teaching materials and resources, and assessment and evaluation.

4.2 elements of lesson plan instruction of Local Science subject including teacher's guidebook (explanation of Local Science subject lesson plans) shown as follows:

4.2.1 teacher's guidebook : instruction for both teachers and students describing how to use lesson plans of Local Science subject

4.2.2 learning materials for students: sets of instruction cards, sets of content cards, sets of activity card, sets of question cards, and sets of answer key cards.

4.2.3 Teaching materials: teaching materials and materials for experiments, etc.

4.2.4 Answer sheets

4.3 Handbooks of suggestions for teachers

4.4 Other things to prepare in advance

4.5 Classroom management

4.6 Students' guidebooks

The lesson plans were evaluated by 3 specialists in science who are a senior professional level teacher, a university instructor, and a specialist in science field.

3. Depending on IOC, the 5-rating scale questionnaires asking for understanding contents from 8 lessons of Local Science subject was evaluated by 3 specialists. The result was between 0.66 to 1.00.

4. Depending on IOC, the 5-rating scale questionnaires asking for satisfaction of classroom activities was evaluated by 3 specialists. The result was between 0.66 to 1.00.

## 5. Methodology

There are four procedures including:

**L (Learning):** learners would learn contents of the subject in group which can be described the process as follows

1. Lecturer explained course description, course contents, classroom activities, and assignments.

2. Lecturer explained the use of Project Based learning (PBL) in Local Science subject by integrating the research "Effects of using Activity-Based learning as Outdoor Education in Local Science subject for Science major students"

3. Lecturer explained the contents of the subject according to the handouts of Local Science subject.

4. With seniors who performed pretty well last academic year, knowledge sharing activity related to field study was hold in order to study and analyze the context of learning resources in local community, to do knowledge capture, and to design and create lessons.

5. Students are divided into groups consisting of 6 members each. Each group chose local communities for field study. They then studied from various types of sources such as books, videos, online media, etc. They could choose learning resources and information according to their interests. After that, they analyzed and concluded their information through mind maps. Next, they presented their mind maps to the class and the lecturer gave them suggestions and advices. This could help promote self-directed learning to students so that they were able to plan and choose the learning materials independently. Writing a summary could help them review what they have just

learned. They could analyse and summarize their knowledge according to their understanding. They would be able to practice and improve their thinking and writing.

6. Students planned for their field study by dividing their responsibilities according to their proficiency.

7. Students went on their field study for searching for information and knowledge related to the contexts of local learning resources or learning areas associated with many organizations and people such as local teachers, students, undergraduates, local philosophers, and/or local administration organization. Then, they analyzed information and knowledge they collected.

8. From information and knowledge they collected and analyzed, students planned and designed their lesson plans related to local learning resources and presented to their classmates and lecturer to give some suggestions and comments.

**D (Discussion):** applying knowledge from L (Learning) procedure to classroom discussion which can be divided into two types including

1. Content creation by students: this was the process of working in groups. Each group would be called Owner which had their own interested topics in accordance with Local Science. Each group would present their topics to the classmates. They were required to plan and design their instructional model. Learning in this way could help promote students' collaboration and team work skills. They would be encouraged to design their learning and improve their thinking and self-directed learning.

2. Student discussion class: students had a discussion on the topics they learned. Each "owner" would lead the discussions. This could help promote more interaction. They would learn the value of knowledge and be able to express their own opinions. They also could take more advantages from knowledge they gained.

**E (Elaboration):** the process which lecturer encouraged students to enhance their knowledge and understanding of their concepts deeply and extensively. With the help from lecturer, students could be able to apply the knowledge from their field studies to design and create their lessons related to Local Science and they could hold activities in schools. This process could help promote students to create their own concepts, process, and skills.

**Q (Quiz):** the post-test after learning and discussion process. Each group with their own local science topics would make conclusion using various kind of techniques in order to evaluate how much their presentation and discussion were succeeded. The lecturer tested the students with 4-questions test and interviewed them about what they gained from learning and doing activities in Local Science subject. Students presented their answers in form of mind map. This can be said to be the process of approving students' knowledge and understanding which could lead the lecturer to improve in her teaching skills. It's also the process of collecting, synthesizing and interpreting efficiency of instructional model. Moreover, local wisdoms were promoted as lessons in Local Science subject through video presentation.

#### Research Analysis

After the data collection, the results from questionnaires asking for understanding contents and activities satisfaction questionnaires were analyzed by mean ( $\bar{x}$ ) and standard deviation (S.D.).

## 6. Results and Discussion (TH SarabunPSK 14 Point Point Bold)

The result of this research can be described as follows:

Students understand the contents of Local Science subject through Activity based learning as shown in

Table 1.

**Table 1 Evaluation of students' understanding and knowledge levels according to the contents of Local Science subject through Activity based learning**

Contents	$\bar{X}$	SD.	levels
<b>understanding and knowledge gained from learning through Activity based learning</b>			
1. Lesson 1 Local Science: definition of general science and local science, advancement in science and technology and their advantages, and innovations from local wisdoms.	4.09	0.62	High
2. Lesson 2 Local Wisdom: history of local wisdom, elements of local wisdom, types of local wisdom, importance of local wisdom, the origin of local wisdom, and local wisdom related to local science.	4.13	0.65	High
3. Lesson 3 Scientific Inquiry: definition of scientific inquiry, classification of scientific inquiry, scientific inquiry compared with original inquiry, general qualifications of scientific inquiry, inquiry cycle method, levels of scientific inquiry, the process of scientific inquiry, important factors which support teaching through scientific inquiry, scientific inquiry of scientists, and classroom inquiry.	4.13	0.68	High
4. Lesson 4 The Study and Analysis of local community contexts: definition of learning resources, importance of learning resources, types and characteristics of learning resources, applying learning process with local wisdoms and local learning resources, resources that help finding information of local wisdoms, the study of contexts of local learning resources, advantages of learning resources, how to convert knowledge from local wisdoms.	4.09	0.65	High
5. Lesson 5 Planning and Field Practice of studying local wisdom: principles of choosing field for field practicing, important things to know before starting field practice, the separation of elements of study, materials and tools used in collecting data, interview techniques, data collection, data evaluation, data analysis, how to be successful in field practicing.	4.17	0.67	High
6. Lesson 6 Designing, Creating, and Evaluating Local Science Lessons through IOC: how to design, create, and develop teaching and learning materials and resources, applying knowledge and local wisdom to create local science lessons, elements of local science lessons, how to evaluation local science lessons through IOC.	4.15	0.66	High
7. Lesson 7 Knowledge Management and Utilization of Local Wisdoms: knowledge management, knowledge management of local community,	4.13	0.61	High

Contents	$\bar{X}$	SD.	levels
knowledge transfer, how to utilize local wisdom, how to develop local wisdom, and local wisdom preservation			
8. Lesson 8 Local Wisdom to creating innovation: value added on local wisdom, creating innovation from local wisdom and sustaining Thai local wisdom, local wisdom and sustainable education, and the protection of local wisdom	4.09	0.62	High
<b>Average</b>	4.12	0.03	High
<b>Advantages of</b>			
9. Using PBL in teaching helps promote content understanding.	4.02	0.71	High
10. Students are able to apply knowledge inside classroom and knowledge inside classroom to other subjects.	4.34	0.67	High
11. Students are able to <u>transfer</u> knowledge inside classroom and knowledge outside classroom.	4.23	0.67	High
12. Students are able to apply knowledge inside classroom and knowledge outside classroom to design and create learning activities and local science lessons which serve the needs of schools.	4.28	0.68	High
<b>Average</b>	4.22	0.14	High
<b>Evaluation on classroom activities through Activity Based learning (ABL)</b>			
13. Students understand the contents of the subject <u>before</u> learning through ABL.	3.62	0.87	High
14. Students understand the contents of the subject <u>after</u> learning through ABL.	4.23	0.67	High

#### Knowledge gained from learning in the subject

Overall, the result from the questionnaires revealed that their understanding and knowledge gained from learning through Activity based learning is at a high level ( $\bar{X} = 4.12$ ,  $SD = 0.03$ ). The lesson with the highest mean was lesson 5 (Planning and Field Practice of studying local wisdom) which was  $\bar{X} = 4.12$ ,  $SD = 0.67$  followed by lesson 6 (Designing, Creating, and Evaluating Local Science Lessons through IOC), lesson 2 (Local Wisdom), lesson 3 (Scientific Inquiry), lesson 7 (Knowledge Management and Utilization of Local Wisdoms), lesson 1 (Local Science), lesson 4 (The Study and Analysis of local community contexts), and lesson 8 (Local Wisdom to creating innovation).

#### Advantages of learning through Activity based learning

Students thought that there were advantages from learning through Activity based learning and the overall result from the questionnaires was at high level ( $\bar{X} = 4.22$ ,  $SD = 0.14$ ). Students' satisfaction on "being able to apply knowledge inside classroom and knowledge outside classroom to other subjects" was at the highest level ( $\bar{X} = 4.34$ ,  $SD = 0.67$ ) followed by "being able to apply knowledge inside classroom and knowledge inside classroom to design and create learning activities and local science lessons which serve the needs of schools", "being able to transfer knowledge inside classroom and knowledge outside classroom", and "using PBL in teaching helps promote content understanding".

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**Evaluation on classroom activities through Activity Based learning (ABL)**

The result stated that students' understanding on contents of the subject **after** learning through ABL ( $\bar{X} = 4.23$ , SD = 0.67) was higher than **before** learning through ABL ( $\bar{X} = 3.62$ , SD = 0.87).

The integration of knowledge inside classroom and knowledge outside classroom of the samples for designing and creating local science lessons and designing classroom activities can be shown as in Table 2.

**Table 2** Evaluation Scores of Creating Local Science Lessons and Designing Classroom Activities in schools

(The samples were divided in groups)

Group no.	Local Science Lessons / schools	No. of members	Evaluation (Scores)			
			Local Science Lessons (20)	Classroom Activities in schools (20)	Videos (10)	Total Scores (50)
1	cooking Pad Thai in Suphap style, Nakorn Chum / Kamphaeng Phet Kindergarten School (Baan Nakorn Chum)/ Prathom Suksa 4	6	18	11	8	37
2	making peanut sausage, Nakorn Chum / Kamphaeng Phet Kindergarten School (Baan Nakorn Chum)/ Prathom Suksa 3	6	16	14	9	39
3	making peanut sausage, Nakorn Chum / Wat Phra Borommthath School / Prathom Suksa 6	6	16.5	10	8	34.5
4	making fermented old tea leaves, Nakorn Chum / Kamphaeng Phet Kindergarten School (Baan Nakorn Chum)/ Prathom Suksa 5	6	17	11	5	33
5	making Chakangrao grass jelly / Wat Khu Yang School/ Prathom Suksa 5	6	19	9	7	35
6	Buddha Image Amulet Creation, Nakorn Chum / Chakangrao School	6	17	12	7	36

Group no.	Local Science Lessons / schools	No. of members	Evaluation (Scores)			
			Local Science Lessons (20)	Classroom Activities in schools (20)	Videos (10)	Total Scores (50)
7	Banana Stalk Carving, Ban Pak Khlong Tai, Nakorn Chum/ Wat Phra Borommathat School/ Prathom Suksa 5	6	17	11.5	6.5	35
8	Kite making, Ban Songtham / Ban Songtham School/ Prathom Suksa 4	6	18	14	9	41

According to table 2, the result stated that the samples' scores were in the range of 33 – 41 out of 50 which were 70-79% and were at good and excellent levels. All of them were able to create local science lessons, manage classroom activities, and introduce local wisdoms through video presentation. Eight lessons the samples designed consisting of 1) cooking Pad Thai in Suphap style, Nakorn Chum, 2) making peanut sausage, Nakorn Chum, 3) making Kanom Tua Pab, Nakorn Chum, 4) making fermented old tea leaves, Nakorn Chum, 5) making Chakangrao grass jelly, 6) Buddha Image Amulet Creation, Nakorn Chum, 7) Banana Stalk Carving, Ban Pak Khlong Tai, Nakorn Chum, 8) Kite making, Ban Songtham.

Students satisfactions through Activity based learning will be shown in Table 3.

**Table 3** Students satisfactions through Activity based learning of Local Science Subject

Contents	$\bar{X}$	SD.	Level
<b>The Procedures and process of Teaching</b>			
1. Procedures and process of instructional model help students understand contents easily.	3.89	0.52	High
2. Procedures and process of instructional model are suitable.	3.91	0.58	High
3. Procedures and process of instructional model are various.	4.02	0.71	High
4. Procedures and process of instructional model are beneficial.	4.15	0.78	High
<b>Average</b>	<b>3.99</b>	<b>0.12</b>	<b>High</b>
<b>The Procedures and process of transferring knowledge</b>			
5. Teachers are able to transfer knowledge.	4.06	0.70	High
6. The contents in the lessons were related to those in the training course.	4.09	0.78	High
7. There was good time management which was appropriate to the contents.	4.00	0.66	High
8. There were Q&A sessions and sessions of giving suggestion.	4.09	0.65	High
<b>Average</b>	<b>4.06</b>	<b>0.04</b>	<b>High</b>

The Procedures and process of activity planning			
9. Procedures and process of activity planning were easy to understand.	4.02	0.71	High
10. Procedures and process of activity planning were suitable.	4.15	0.69	High
11. Procedures and process of activity planning were various.	3.89	0.63	High
12. Procedures and process of activity planning were beneficial.	4.13	0.61	High
<b>Average</b>	<b>4.05</b>	<b>0.12</b>	<b>High</b>

According to the table, students' satisfactions through Activity based learning of Local Science Subject can be described as follows.

#### The Procedures and process of Teaching

The overall result was at a high level ( $\bar{X}$  = 3.99, SD = 0.12). Students' satisfactions on the item "procedures and process of instructional model are beneficial" was at the highest ( $\bar{X}$  = 4.15, SD = 0.78) followed by "Procedures and process of instructional model are various.", "Procedures and process of instructional model are suitable", and "Procedures and process of instructional model help students understand contents easily".

#### The Procedures and process of transferring knowledge

The overall result was at a high level ( $\bar{X}$  = 4.06, SD = 0.04). Students' satisfactions on the items "The contents in the lessons were related to those in the training course." and "There were Q&A sessions and sessions of giving suggestion." were at the highest ( $\bar{X}$  = 4.09, SD = 0.78 and  $\bar{X}$  = 4.09, SD = 0.65) followed by "Teachers have abilities to transferring knowledge.", and "There was good time management which was appropriate to the contents."

#### The Procedures and process of activity planning

The overall result was at a high level ( $\bar{X}$  = 4.05, SD = 0.12). Students' satisfactions on the items "Procedures and process of activity planning were suitable." was at the highest ( $\bar{X}$  = 4.15, SD = 0.69) followed by "Procedures and process of activity planning were beneficial.". "Procedures and process of activity planning were easy to understand.", and "Procedures and process of activity planning were various."

## 7. Conclusion (TH SarabunPSK 14 Point Bold)

The results from the questionnaires revealed that their understanding and knowledge gained from learning through Activity base learning is at high level ( $\bar{X}$  = 4.12, SD = 0.03). Students thought that there were advantages from learning through Activity base learning and the overall result from the questionnaires was at high level ( $\bar{X}$  = 4.22, SD = 0.14). The result of evaluation on classroom activities through Activity Base learning stated that students' understanding on contents of the subject **after** learning through ABL ( $\bar{X}$  = 4.23, SD = 0.67) was higher than **before** learning through ABL ( $\bar{X}$  = 3.62, SD = 0.87). The samples' scores of creating local science lessons and designing classroom activities in schools were in the range of 33 – 39.5 out of 50 which were 70-79% and were at good and excellent levels. All of them were able to create local science lessons, manage classroom activities, and introduce local wisdoms through video presentation. Eight lessons the samples designed consisting of 1) cooking Pad Thai in Suphap style, Nakorn Chum, 2) making peanut sausage, Nakorn Chum, 3) making Kanom Tua Pab, Nakorn Chum, 4) making fermented old tea leaves, Nakorn Chum, 5) making Chakangrao grass jelly, 6) Buddha Image Amulet Creation, Nakorn Chum, 7) Banana Stalk Carving, Ban Pak Khlong Tai, Nakorn Chum, 8) Kite making, Ban Songtham.

Students' satisfactions on Activity base learning in term of the procedures and process of teaching, the procedures and process of transferring knowledge, and the procedures and process of activity planning were at high level ( $\bar{X} = 3.99$ ,  $SD = 0.12$ ). The overall satisfactions were at high level which were  $\bar{X} = 4.06 \pm 0.04$ ,  $\bar{X} = 4.05 \pm 0.12$  and  $\bar{X} = 4.15 \pm 0.69$ .

Students should be encouraged to enhance their knowledge in order to improve their abilities of critical thinking and working so that they would be able to live happily with others (Solgosoom and Pothisaan, 2018). This can be defined as the student development followed King Rama IX's Philosophy.

Moreover, it is a method in 21<sup>st</sup> century which helps improve students to have appropriate living skills by promoting their learning skills. They will then gain more knowledge, improve the essential abilities and skills which is the result of changing instructional model (Panich, 2012)

After learning through Activity based learning, students improved themselves in 7 aspects including 1) knowledge of filed practice, 2) communication skills with organisations, 3) collaborative skills, 4) assertion, abilities of sharing and assigning the workload, punctuality, and good human relation skills, 5) integration of assignments of Local Science subject for instructional design and instructional media design, 6) classroom management skills, time management skills of learning activities, patience skills, and problem-solving skills, and 7) the improvement of their assignments consisting of Local Science lesson plans, school activity plans, and video making in order to present local wisdom.

## 9. Acknowledgment

To make it more effective, there should be more time for classroom activities to improve 21<sup>st</sup> century skills in students. Teachers in schools and others can apply this instructional model to their teaching according to their environments.

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RUNIRAC VI

# Certificate of Recognition

Presented to

Montha Meepripruk, Nantanat Tonboon, Orathai Boontiang

For their paper entitled

The Integration of King Rama IX Philosophy and characteristics of 21<sup>st</sup> century youth to improve undergraduates majoring in teaching science

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