

## Knowledge of Youth at Ban Koh Muk, Trang Province, Participating in a Youth Camp to Protect Seagrass and Aquatic Animals

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### Abstract

The objective of this research is to study youth's knowledge regarding seagrass and aquatic animal breeding. The target group was young members of a youth group that were descended from small-scale fishers in the Lae Lay group in Thailand. It was found that, after participation in the youth camp, the students' knowledge about aquatic animal breeding (71.67%) was higher than the criterion specified for passing (70%) among those aged 10-14 years old. However, their knowledge about seagrass and total knowledge (66.15% and 68.27%, respectively) was lower than the specified criterion of 70%. Moreover, their knowledge about seagrass, aquatic animal breeding, and total knowledge after participation in the camp was significantly higher than before participation in the youth camp at the 0.05 level. On the other hand, the knowledge about seagrass, aquatic animal breeding, and total knowledge (40.63%, 58.33%, and 47.44%, respectively) for those aged 7-9 years old was lower than the specified criterion of 70%. Moreover, their knowledge about seagrass, aquatic animal breeding, and total knowledge before and after participation in the camp did not differ significantly at the 0.05 level.

**Keywords:** knowledge, youth camp, seagrass, aquatic animals

### Introduction

The lifestyle of small-scale fishers on Koh Muk (Muk Island), Koh Libong subdistrict, Kantang district, Trang province, in Thailand depends heavily on natural resources. The number and size of aquatic animals has diminished due to overfishing and this has had a direct impact on small-scale fishers. Under the project "Participatory action research of small-scale fishers on the performance of green aquatic animal business and aquatic animal restoration in the seagrass bed of the Koh Muk community, Trang province," the Lae Lay group was established with two objectives: 1) to conduct business in the community for the well-being of its members by increasing the value of aquatic animal fishing without using illegal fishing gear; and 2) to restore aquatic animals in the seagrass bed of the Koh Muk community. The Lae Lay group was set up through the process of planning three community forums to analyze problems, to assess community capacity, and to make plans for the green aquatic animal business and aquatic animal restoration in the seagrass bed of the Koh Muk

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community. The activities of the Lae Lay group related to local resources are: 1) to restore aquatic animals and to monitor the destruction of marine resources; and 2) to raise consciousness and transfer concepts about sustainability to the youth in the area.

Youth have a special interest in and responsibility for the environment because the deterioration or destruction of the environment has a particular impact on them, in that they will have to spend their entire lives in the environmental conditions caused by previous generations. The young have a greater stake in the long-term effects of environmental issues and sustainability. Therefore, young people are the leaders of the environmental movement. They participate in protecting the environment at many different levels: for example, grass roots movements, involvement in conservation projects, as well as making plans for the future (Economic and Social Affairs, 2004: 131, 134-135).

Trang province has the largest seagrass areas in Thailand-about 33,066.50 rai. Seagrass ecology is very important for aquatic animal habitats, aquatic larvae feeding, and aquatic living sources for both large and small animals, especially as food for dugongs. Moreover, these areas also help to filter and improve water quality because there is a root system for holding the soil in order to prevent ground erosion (Marine and Coastal Resources Research & Development Institute, 2015: 65, 101).

Due to the importance of youth's role in protecting the environment, environmental camps are one method for creating the consciousness of youth. The Office of Overseas Programming and Training Support: (OPATS) (2017) has specified several activities for environmental youth camps. For example, ecology activities include ecosystem webs, food webs, pollination brain teasers, and seed dispersal exhibit. Animal activities consist of bat and moth games, bird watching, insect exploration, wildlife habitats, name that animal, and camouflaged critters. Moreover, Burns et al. (2011: 4) have reported about the type of outdoor activities that are related to animals, plants, conservation and planet care, and hiking. These activities must be suitable with the area and local resources. However, there are still no activities about seagrass and aquatic animals, such as blue swimming crab and squid.

The University of Waterloo (n.d.: 3) studied Canadian summer camps and reported five major aspects: 1) social integration and citizenship; 2) environmental awareness; 3) self-confidence and personal development; 4) emotional intelligence; and 5) physical activity. Moreover, the study of ERDOĞAN (2011: 2233) also found that ecology-based summer nature education programs contributed significantly to the responsible environmental behavior of primary school students.

In order to accommodate the resources of Koh Muk's area, the knowledge acquisition of the youth at Ban Koh Muk following their participation in a youth camp to protect seagrass and aquatic animals was studied. The youth that participated in the camp learned about important resources in their local area, and that enabled them to link the relationships between the seagrass beds and various types of aquatic animals, especially dugongs, which were significant indicators of an abundant ecology system. This affected the youth in terms of

raising their good attitude, awereness, and the perceived value of their local natural resources. Hence, the youths now tend to protect and utilize their local recources without destruction.

### **Objectives**

1. To assess youths' acquisition of knowledge about seagrass and aquatic animal breeding

### **Hypotheses**

1. After participation in the youth camp, the youths' knowledge about seagrass and aquatic animal breeding will be higher than the specified passing criterion of 70%

2. After participation in the youth camp, the youths' knowledge about seagrass and aquatic animal breeding will be higher than that before participation in the youth camp.

### **Methods**

#### **1. Study area**

Koh Muk in Tambon Koh Libong, Kantang district, Trang province in Thailand was selected for the present study because the villagers in this area make their main living by fishing. Seagrass is abundant in the area, and the region also has an aquatic animal bank, even though its operations have not progressed as expected.

#### **2. Population and sample**

The population was the 28 young members of the youth group that were descended from the small-scale fishers in the Lae Lay group.

The sample size was calculated by using Krejcie and Morgan's table, and the sample size was 24 persons. However, there were 18 persons that participated in all of the activities of seagrass and aquatic animal breeding, including testing and knowledge before and after participating in the camp.

#### **3. Time and place**

The youth camp to protect the seagrass and aquatic animals lasted in two days at the Ban Koh Muk aquatic animal bank learning center.

#### **4. Research instruments**

##### **4.1 Creating the research instruments**

A test of knowledge regarding two topics-seagrass and aquatic animal breeding-was developed; the test used a multiple-choice format with four choices for each question.

##### **4.2 Validating the quality of the research instruments**

Content validity for the knowledge test was examined by three scientific experts in seagrass and aquatic animal breeding. The index for the item objective congruence (IOC) value for all questions was higher than 0.50 (IOC 1.00-1.00) following improvement of some questions after recommendations from the experts.

#### **5. Data collection**

Before participating in the activities of the camp, the youths' knowledge was tested, and their knowledge was re-tested at the end of the camp.

## 6. Data analysis

SPSS v.21 was used to analyze the data, and the Wilcoxon signed rank test was used to test the difference in the scores before and after participating in the youth camp.

## 7. Steps in conducting the activities

### 7.1 Youth camp preparation

1) The students in the Marine Science Club, the Faculty of Science and Fisheries Technology, Rajamangala University of Technology Srivijaya, Trang campus were assigned as lecturers in the youth camp by separating 15 students into two groups. Each group was responsible for designing activities for the youth camp for each topic: seagrass and aquatic animal breeding (blue swimming crabs and squids). They prepared documentation and a knowledge test under the supervision of the researchers. The entire package was then submitted to a panel of experts for examination.

2) The students divided up the duties and assumed responsibility for the various activities in the youth camp, prepared the material and equipment for each activity, and conducted both lecture and practical sessions during the youth camp.

Several activities about seagrass and aquatic animal breeding were because these activities would help the youth have more knowledge, appreciation of their local resources, and the consciousness to carry on community's resource conservation in the future, as follows.

### 7.2 Activities about seagrass

The lecturers explained the basics of seagrass growth and ecology. In addition, in the practice session, the youth were divided into four groups to carry out the following activities:

Activity I: drawing aquatic animals in the seagrass bed-the youth in each group drew pictures of aquatic animals on a clip chart and counted the number of aquatic animals.

Activity II: identifying seagrass types- the youth in each group examined 4 to 5 types of seagrass collected from the area in order to determine the dominant features by comparing the specimens with the information found in the documents that they had received during the lectures. Then they specified the types of seagrass and drew pictures of the seagrass.

Activity III: surveying and recording the density of the seagrass-a survey was conducted at Makam Bay by setting a survey line to extend a measuring tape vertically along the coastline. The seagrass found at the first point was assigned to youth group I for surveying. Following this, three survey areas were determined by measuring five meters from the first point each in length for groups II to IV, respectively. They conducted the survey by setting out quadrats of 50x50 centimeters to count and record the density of each type of seagrass.

### 7.3 Activities about aquatic animals

The lecturers explained aquatic animal breeding (blue swimming crabs and squids), and after that, during the practice session, the youth were separated into two groups to do the following activities.

Activity I: identifying the sex of the blue swimming crabs and drawing—the youth examined samples of male and female blue swimming crabs and drew pictures of them.

Activity II: studying the stages of larval growth—the youth observed the larvae of the blue swimming crabs at the zoea and magalopa stages and asked and answered questions and drew pictures of the larvae.

Activity III: identifying squid eggs according to their appearance—the youth examined samples of various types of squid eggs—splendid squid, octopus, soft cuttlefish, and rainbow cuttlefish—and asked and answered questions and drew pictures of the squid eggs.

## Results

### 1. Personal factors regarding the youth

The majority of the youth participating in the youth camp to protect the seagrass and aquatic animals were male (73.68%). All were Muslim. The largest number was between 10 and 12 years of age, followed by those age 7 to 9 years old (55.56% and 33.33%, respectively). The majority were at the late primary level (Prathom 4-6), but some were at the early primary level (Prathom 1-3) (55.563% and 33.33%, respectively). Only a few students were at the lower secondary level (Matthayom 1-2) (10.53%), as shown in Table 1.

Table 1: Frequency, Percentage, Mean, and Standard Deviation for Personal Factors Regarding the Youth

Items	Frequency (n=18)	Percentage
<b>Sex</b>		
Male	14	73.68
Female	5	26.32
<b>Religion</b>		
Islamic	18	100.00
<b>Age</b>		
7-9 years	6	33.33
10-12 years	10	55.56
13-14 years	2	11.11
Min = 7    Max = 14    Mean 10.00    SD=1.76		
<b>Education</b>		
Early primary (Prathom 1-3)	6	33.33
Late primary (Prathom 4-6)	10	55.56
Lower secondary (Matthayom 1-2)	2	11.11

### 2. Youths' knowledge before and after participation in the camp

#### 2.1 Youths' knowledge after participation in the camp compared to the specified passing criterion of 70%

After participation in the youth camp, for those aged 10 to 14 years, their knowledge about aquatic animal breeding (71.67%) was higher than the specified passing

criterion of 70%. However, their knowledge about seagrass and total knowledge (66.15% and 68.27%, respectively) were lower than the specified criterion of 70%. For the youth around 7 to 9 years of age, their knowledge about seagrass, aquatic animal breeding, and total knowledge (40.63%, 58.33%, and 47.44%, respectively) were lower than the specified criterion of 70%. Overall, their knowledge of seagrass, aquatic animal breeding, and total knowledge were lower than the specified criterion of 70% (57.64%, 67.22% and 61.32%, respectively), as shown in Table 2.

Table 2: Mean, Standard Deviation, and Percentage for Knowledge after Participation in the Youth Camp

Knowledge	Total scores	Mean	SD	Percentage of total
<b>Youth 7-9 years old (n=6)</b>				
Seagrass	16	6.50	3.73	40.63
Aquatic animal breeding	10	5.83	2.93	58.33
<b>Total</b>	<b>26</b>	<b>12.33</b>	<b>6.22</b>	<b>47.44</b>
<b>Youth 10-14 years old (n=12)</b>				
Seagrass	16	10.58	2.43	66.15
Aquatic animal breeding	10	7.17	1.59	71.67
<b>Total</b>	<b>26</b>	<b>17.75</b>	<b>3.60</b>	<b>68.27</b>
<b>Overall (n=18)</b>				
Seagrass	16	9.22	3.44	57.64
Aquatic animal breeding	10	6.72	2.14	67.22
<b>Total</b>	<b>26</b>	<b>15.94</b>	<b>5.16</b>	<b>61.32</b>

## 2.2 Comparison of youths' knowledge before and after participation in the camp

For those aged 10 to 14 years of age, their knowledge about seagrass, aquatic animal breeding, and total knowledge after participation in the camp were significantly higher than before participation in the youth camp at the 0.05 level: medians 9.00 and 11.00, respectively, for seagrass knowledge ( $z=-2.108$   $p$ -value=0.035); medians 5.00 and 7.00, respectively, for aquatic animal breeding knowledge ( $z=-2.880$   $p$ -value=0.004); and medians 14.00 and 18.00, respectively, for total knowledge ( $z=-2.773$   $p$ -value=0.006).

However, for those aged 7 to 9 years, their knowledge about seagrass, aquatic animal breeding, and total knowledge before and after participation in the camp did not differ significantly at the 0.05 level: medians 8.00 and 6.50, respectively, for seagrass knowledge ( $z=-0.744$   $p$ -value=0.457); medians 4.00 and 6.50, respectively, for aquatic animal breeding knowledge ( $z=-1.480$   $p$ -value=0.139); and medians 11.50 and 14.00, respectively, for total knowledge ( $z=-0.954$   $p$ -value=0.340).

Overall, their knowledge about aquatic animal breeding and total knowledge after participation in the camp were significantly higher than before participation in the youth

camp at the 0.05 level: medians 4.00 and 7.00, respectively, for aquatic animal breeding knowledge ( $z=-3.194$   $p\text{-value}=0.001$ ); and medians 13.50 and 17.00, respectively, for total knowledge ( $z=-2.705$   $p\text{-value}=0.007$ ). However, their total knowledge before and after participation in the camp did not differ significantly at the 0.05 level: medians 8.50 and 10.50, respectively ( $z=-1.269$   $p\text{-value}=0.205$ ), as shown in Table 3.

Table 3: Median and Wilcoxon z Value for Knowledge after Participation in the Youth Camp

Knowledge	n	Median	IQR	Wilcoxon z value	p-value
<b>Youth of 7-9 years old</b>					
<b>Seagrass</b>					
Before the youth camp					
camp	6	8.00	3.75	-0.744	0.457
After the youth camp	6	6.50	5.00		
<b>Aquatic animal breeding</b>					
Before the youth camp					
camp	6	4.00	1.25	-1.480	0.139
After the youth camp	6	6.50	5.00		
<b>Total</b>					
Before the youth camp					
camp	6	11.50	4.75	-0.954	0.340
After the youth camp	6	14.00	9.50		
<b>Youth of 10-14 years old</b>					
<b>Seagrass</b>					
Before the youth camp					
camp	12	9.00	3.50	-2.108*	0.035
After the youth camp	12	11.00	3.50		
<b>Aquatic animal breeding</b>					
Before the youth camp					
camp	12	5.00	2.75	-2.880*	0.004
After the youth camp	12	7.00	2.50		
<b>Total</b>					
Before the youth camp					
camp	12	14.00	2.00	-2.773*	0.006
After the youth camp	12	18.00	6.25		
<b>Overall</b>					
<b>Seagrass</b>					
Before the youth camp					
camp	18	8.50	2.50	-1.269	0.205
After the youth camp	18	10.50	5.25		

**Aquatic animal breeding**

Before the youth					
camp	18	4.00	2.00	-3.194	0.001*
After the youth camp	18	7.00	2.50		
<b>Total</b>					
Before the youth					
camp	18	13.50	3.00	-2.705	0.007*
After the youth camp	18	17.00	5.75		

\*p &lt; 0.05

In addition, the responses to the open-ended questions showed that, after participation in the youth camp to protect the seagrass and aquatic animals, the youth were happy, enjoyed the program, and gained knowledge about seagrass and aquatic animal breeding. They also had a good attitude toward the resources in the community and increased their awareness about dugongs, seagrass, and aquatic animals. Examples of their answers are as follows:

Happy and enjoyed the activity

*“I like, am happy, and enjoyed it.”*

*“I feel so good.”*

*“We are very glad that the lecturers introduced us to dugongs, seagrass, and aquatic animals.”*

Knowledge gained

*“I obtained knowledge and developed critical thinking by participating in the activities.”*

*“I got knowledge about seagrass and aquatic animal breeding.”*

*“I received knowledge about seagrass and a variety of aquatic animals and had fun participating in activities with lecturers and want them to come back again.”*

*“I gained a lot of knowledge, developed my abilities, enjoyed the program, and was happy.”*

Attitude toward the resources in the community

*“I will do more to protect marine animals.”*

*“It is vital to preserve the seagrass and learn about aquatic animal breeding.”*

*“I love the sea and marine animals, was happy with the way the lecturers taught, and I gained knowledge and improved my abilities.”*

Raised consciousness

*“I love the environment and will not destroy it.”*

*“Seagrass is a food source for dugongs...I feel love dugongs and seagrass.”*

*“I will protect the seagrass, various aquatic animals, and dugongs to save them from extinction.”*

*“I love aquatic animals and will take care so that they can increase in size and number.”*

## Conclusion

After participation in the youth camp, the youth aged 10 to 14 years surpassed the passing criterion of 70% in their knowledge about aquatic animal breeding (71.67%). However, their knowledge about seagrass and total knowledge (66.15% and 68.27%, respectively) failed to meet the specified criterion of 70%. Moreover, their knowledge about seagrass, aquatic animal breeding, and total knowledge after participation in the camp were significantly higher than before participation in the youth camp at the 0.05 level. The youth aged 7 to 9 years also failed to meet the criterion of 70% for knowledge about seagrass, aquatic animal breeding, and total knowledge (40.63%, 58.33%, and 47.44%, respectively). In addition, their knowledge about seagrass, aquatic animal breeding, and total knowledge before and after participation in the camp did not differ significantly at the 0.05 level.

## Discussion

The issues that will be discussed below are learning sources, learning activities, and knowledge.

### Learning sources

Makam Bay, with a distribution of seagrass, was selected for surveying seagrass activity. As Rae and Pearse (2004) have discussed, the study of area-based learning sources that today is likely to be an outdoor field study and an environmental study.

### Learning activities

Both the seagrass and aquatic animal breeding learning activities of the youth camp that made the youth learn about local resources are consistent with Thailand's national education policy (National Education Act B.E. 2542). The related agencies in education management have to offer education that provides learners with knowledge and good morals, as well as knowledge that corresponds with the local conditions so that the learners can learn about their real life and local resources (Office of the Council of State of Thailand, 1999).

The learning activities focused on practice by dividing the youth into 2 to 4 groups to cooperate in several activities, such as drawing pictures of the aquatic animals in the seagrass bed, classifying the types of seagrass, doing seagrass survey, classifying the sex of the blue swimming crabs, studying the larvae of the blue swimming crabs at various stages, and classifying squid eggs. It could be said that the youth learned from their active experimentation (Chutibud, 2011).

The learning activities in the youth camp included three aspects: knowledge, skills, and consciousness, as the European Communities (2006: 9) has stated that any learning activities should be designed to improve the knowledge, skills, and abilities of people. Moreover, Bloom's taxonomy (Banks, 2000; Wirth & Perkins, 2008) classified learning objectives into three domains: cognitive, affective, and psychomotor, as follows.

1) Knowledge: the youth gained knowledge about seagrass and aquatic animal breeding, as Fly (n.d.) mentioned that the benefits of place-based outdoor study are academic practice, including developing more knowledge about nature.

2) Skills: the youth developed skills in classifying various types of seagrass, recording seagrass density, classifying the larvae of blue swimming crabs at various stages, and classifying squid eggs. This is consistent with Bloom's taxonomy (1956 cited in Banks, 2000; Wirth & Perkins, 2008), which discussed the psychomotor domain.

3) Consciousness: the youth's participation in the seagrass survey in their community provided them with ecological knowledge and enabled them to see the relationships of living things in seagrass beds. This helped them to be conscious of the conservation of the local resources in their community, such as seagrass and dugong. This is consistent with Banks (2000) and Buckler (1996), who stated that learning is an information process that causes behavioral changes. Moreover, Fly (n.d.) also mentioned that the benefit of outdoor place-based study is the good care of nature because in this way participants have greater understanding of the relationship between themselves and nature.

The learning activities provided harmony and fun among the youth, and good relationships among all of them as well. This is consistent with Watjinda's notion (2010), who indicated that team learning provides not only learning within groups but also learning between groups. Team learning requires communication skills. Moreover, this is also consistent with the notion of Fly (n.d.), who mentioned that the benefits of outdoor place-based study are learning to communicate important things with other persons, and developing social interaction skills and having fun.

#### Youths' knowledge

After participation in the youth camp, the students' (aged 10 to 14) knowledge about seagrass failed to meet the specified criterion of 70%. Because seagrass content occupied only one day in the curriculum, the time for the topic of identifying species of seagrass, in particular, was not sufficient. So, the youth had difficulty understanding the dominant features and names of all 11 seagrass species in Trang province. In addition, the survey of seagrass was conducted during a very short period of time because the sea water overflowed in the survey area. Moreover, identifying seagrass types is a very difficult activity for youth aged 7 to 9 years, who are studying at the early primary school level (Prathom 1-3).

However, for youth aged 10 to 14 years of age, their knowledge about seagrass, aquatic animal breeding, and total knowledge after participation in the camp was significantly higher than before participation in the study. As Fly (n.d.) has stated, the youth developed more knowledge about nature. Moreover, this finding is also consistent with those of Thasenhod et al. (n.d.), Tee-ngam et al. (n.d.) and Niyomdecha and Sabaiying (2015), who indicated that the participants' knowledge after participation in the camps was higher than before participation in the camps.

After participation in the youth camp to protect the seagrass and aquatic animals, the youth reported that they felt happy, enjoyed the program, and obtained knowledge of seagrass and aquatic animal breeding. They also said that they developed a good attitude toward the resources in the community and increased their awareness about dugongs, seagrass, and aquatic animals. As Fly (n.d.) stated, studying outdoors is the best way to learn to take better care of nature because in this way learners comprehend the relationships among themselves and nature better.

### Recommendations

1. The camp was conducted for youths of 7-9 years old. Thus, the activities, content, media/documents with pictures, including methods for measurement of knowledge should be appropriately designed to match their age.
2. Content regarding seagrass should be increased to cover two days of instruction at the youth camp so that the youth can improve their learning.
3. Utilizing resources in the community to arrange outdoor activities for youth would help them to learn about other resources in the community, e.g., a survey activity of aquatic animals on seagrass bed.

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