

## Development of Maritime Insight Learning Tools for Ocean Literacy in Children Aged 5-6 Years Old

Nanang Sahriana <sup>1✉</sup>, Tri Suminar <sup>2</sup>, Yuli Kurniawati Sugiyo Pranoto <sup>2</sup>

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<sup>1</sup> Pendidikan Guru-Pendidikan Anak Usia Dini, Universitas Halu Oleo, Indonesia

<sup>2</sup> Pascasarjana, Universitas Negeri Semarang, Indonesia

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### Abstract

Indonesia as an archipelagic country should be introduced to early childhood. Therefore, it is necessary to develop maritime insight learning tools for children in coastal areas. The objectives of this research were to develop maritime insight learning tools for ocean literacy in children aged 5-6 years old and to analyze the effectiveness of the learning tools. The learning tools were in the form of semester program, weekly and daily lesson plan, teaching materials, and learning media and were developed by following the conditions and characteristics of the coastal areas. Research & Development with one group pretest-posttest design were conducted in six kindergartens with 80 students at Konawe Utara Regency, Southeast Sulawesi. The research also involved education experts, practitioners, and teachers of that areas as research subjects. Data collection instruments used were observation sheets, questionnaires, tests, and documentation. The results showed that the maritime insight learning tools is valid for use. The result of trials with t-test showed there were an increase in the ocean literacy skills of students after using maritime insight learning tools with n-Gain scores of 0.69 with the category medium on a limited scale trial and 0.70 with the high category in wide scale trial. It concluded that development of the maritime insight learning tools was effective for improving ocean literacy in children aged 5-6 years old.

✉ Correspondence address:  
Papandayan 1, Bendan Ngisor, Gajah Mungkur, Kota Semarang.  
E-mail: [nanang.sahriana@gmail.com](mailto:nanang.sahriana@gmail.com)

## INTRODUCTION

Indonesian's geographic location leads Indonesia a maritime country, but the concept of maritime affairs has not been well and implanted in learning activities, especially early childhood education which is the most basic level of education. All this time, marine knowledge in schools has not become the focus and only gets a small portion of the national education curriculum. Consequently, Indonesian students do not have positive knowledge, attitudes, and perceptions of maritime affairs.

Gandha and Pranata (2015) noted that the underdevelopment of Indonesian children's knowledge of Indonesian nature, especially in the maritime sector, is caused by the educational curriculum is still center on teachers and textbooks without direct interaction with the learning object. It is should become a serious concern, because when these children grow up and become teachers, they do not have the connection with the sea to teach effectively about marine in the classroom (Dromgool et al., 2017). Also, teachers' understanding is still low about the curriculum in coastal areas (Puspitasari and Febrialismanto, 2016).

Lack of knowledge and public interest in the marine can cause damage extinction threat for marine life in Indonesia. According to Fletcher et al. (2009), they stated that the low level of public knowledge and awareness is due to limited information about marine affairs. The maritime sector is not very popular in the field of education in various countries like Indonesia, so it does not get much attention. This is evidenced by the lack of literature on marine education and many researchers who have not focused on this area (Umuhire and Fang, 2016). Besides, marine education is the rarest focus of study and is very difficult to find because research methodologies related to marine are quite difficult to do in kindergartens (Hapidin, Nurjannah, and Hartati, 2018).

One of the efforts to increase knowledge and interest in marine is education from an early age (Crec, Noventius and Bayu, 2018). Steel et al. (2005) argued that increasing public

awareness and knowledge of the oceans would increase support for marine restoration efforts. Therefore, a curriculum with maritime content needs to be given to children from an early age so that they know their national identity and that children have an attitude of pride and love for the country.

Marine education is very important in helping children develop the knowledge, skills, and attitudes needed to preserve the environment, especially coastal ecosystems in the future (Syarah et al., 2019). The introduction of the surrounding natural environment is necessary so that children know their environment and instill a sense of love for their environment and understand the importance of the sea for the future (Khamidun, 2012; Matsumoto et al., 2017; Sakurai, Uehara, and Yoshioka, 2019). Furthermore, Chabanet et al. (2018) emphasized that environmental education for children is one of the basic tools needed to reverse the state of environmental degradation and erosion of biodiversity.

Indonesia's aspiration to return to a maritime axis has also stated in the National Long Term Development Plan (RPJPN) 2005-2025 in point 7 of the national development mission, namely to make Indonesia an independent, advanced, strong archipelago and based on the interests of national sovereignty. It is also a serious concern of President Joko Widodo, who emphasizes the direction of building his cabinet by re-initiating the triumph of the Indonesian nation as a maritime country (Prabowo, 2014).

The maritime loaded curriculum is an effort to provide knowledge and introduce children to nautical or marine life. The maritime loaded curriculum aims to direct early childhood to better understand local potential by exploring Indonesian's marine wealth and elevating the nation's image as a maritime nation. The role of education in instilling a maritime spirit is to include maritime content in the early childhood education (ECE) 2013 curriculum.

All this time, the marine concept has been limited and marginalized in the curriculum, due to limited public knowledge of the principles of

the seabed and not ready to make the right decisions (McPherson et al., 2018). The marine theme is still a theme that has not been taught much in ECE (Zellawati, 2017). Early childhood as the next generation of the ideals of the nation's struggle is the most important part of the national development process as a human investment and as a maritime country, an understanding or feeling of loving the marine world for children must develop from an early age. Irawan (2018) revealed that for maritime education to be successful, students must have good ocean literacy. Ocean literacy does not have to separate material in the ECE curriculum, but maritime material is embedded in every learning theme and activity in kindergarten.

Santoro et al. (2017) defines ocean literacy is an understanding of the influence of the oceans on us, and our influences on the oceans to live and act responsibly for the future. There were seven basic principles of ocean literacy, including 1) the ocean is an inseparable unit and has many characteristics, 2) the oceans and life in them form the characteristics of the earth, 3) the oceans are the main determinants of weather and climate, 4) ) the existence of the oceans is the reason why the earth is habitable to live in, 5) the oceans have a large wealth of biodiversity and ecosystems, 6) the oceans and humans have a very close relationship, and 7) most of the oceans have not been explored.

Ocean literacy is a way not only to raise public awareness about the oceans but also as an approach to encourage all communities and stakeholders to have more responsible and informed behavior towards the oceans and its resources (Guest et al., 2015; Fauville, 2017; Santoro et al., 2017; Tsai and Chang, 2019).

A person is said to have good ocean literacy if he has the following 3 important aspects, firstly knowledge of the ocean, secondly having a good attitude towards the marine environment and not violating marine values, and thirdly having good behavior towards the marine environment (Strang et al., 2007; Hindrasti and Irawan, 2018). These three aspects

are used as indicators for assessing ocean literacy in early childhood (5-6 years old).

A teacher needs to prepare a lesson plan before teaching. Learning planning or learning tools is a teacher's main tool that must be prepared in the face of the learning process in the classroom and becomes a benchmark for professional teachers in evaluating each teaching result.

ECE have given the freedom to create their learning programs are referred to as Permendikbud number 146 of 2014 concerning the Early Childhood Education 2013 curriculum. However, in reality in the field, there are still many ECE educators who have difficulty in developing lesson plans that are following conditions in coastal areas.

The objectives of this research were to develop maritime insight learning tools for ocean literacy in children aged 5-6 years old and to analyze the effectiveness of the learning tools for improving ocean literacy in children aged 5-6 years old. These learning tools were in the form of semester program, weekly lesson plan, daily lesson plan, teaching materials, and learning media. This research was expected to be a reference for research on ocean literacy in children.

## METHOD

This research was a research and development model of the Borg & Gall that adapted to the needs of research, which was divided into 3 stages, namely preliminary stage, development stage, and trials stage. This research was conducted in six kindergartens, namely TK Konasara, TK Nurul Hidayah, TK Wisata Tanjung Taipa, TK Tongalino, TK Mawar, and Kindergarten Mekar Sari at Konawe Utara Regency, Southeast Sulawesi with the research subjects of children group B (5-6 years old) of 80 children. Sources of research data come from education experts and practitioners, teachers, and students. The research design of this study was pre-experimental design with the type one group pretest-posttest design.

The data collection instruments used were observation sheets, questionnaires, tests, and documentation. Learning tools validity was obtained from expert validity. Learning tools effectiveness was obtained from the t-test and n-Gain test, both of them accquired from development stage.

Referring to the ocean literacy assessment instrument developed by Hindrasti and Irawan (2018) has been declared valid and reliable, this research instrument refers to this instrument and has been modified according to the research needs of early childhood.

Indicators of tests ocean literacy consist of 3 important aspects, namely marine insight, caring attitude towards the marine environment, and behavior towards the marine environment. These three aspects were then developed according to the research needs so that they become 10 item questions to measure ocean literacy in children (5-6 years old).

## RESULTS AND DISCUSSION

### Learning Tools Validation

Expert validators and practitioners assess that maritime insight learning tools in the form of semester program, weekly lesson plan, daily lesson plan, teaching materials, and learning media developed can be used with minor revisions. There were several revised components, such as materials that must adjust to the child's age, display layout, use simple sentences, semester programs adapted to the ECE 2013 curriculum format, use of the surrounding environment for children's learning and have been revised according to the validator's suggestion. The results of the assessment of all maritime insight learning tools developed presented in Table 1.

**Table 1.** The Result of Learning Tools Validation

Code	Learning Tools				
	Semester Program	Weekly Lesson Plan	Daily Lesson Plan	Teaching Material	Learning Media
V-1	47	34	77	31	27
V-2	42	29	74	30	26
V-3	46	32	75	31	27
Average	4.5	4.5	4.4	4.4	4.4
Category	Valid	Valid	Valid	Valid	Valid

Based on Table 1, it concluded that the validity test on maritime insight learning tools in early childhood education obtained an average value of 4.44 with a percentage of 88.8% indicated the category was valid to be tested further in research.

The validator considers that this maritime insight learning tool was valid to be given to kindergartens in coastal areas so that children grow with high maritime enthusiasm and values because currently, children's interest in marine is still low (Sulistiani and Mustami'ah, 2015; Fuad and Musa, 2017; Wardani, Sa'ida, and Abidin, 2019). Learning with the marine theme is the right and effective step in overcoming the low

interest in marine in early childhood and providing learning experiences for children about marine.

Valid learning tools were still being repaired first, based on the validator's advice before being used for further trials. Suggestions and follow-up from the learning tools validity test can be seen in Table 2 of the learning tools improvements.

Learning activities in ECE currently do not highlight the potential of coastal areas, therefore in this research include the theme of marine plants with the sub-theme of mangroves, coral reefs, and seaweed in learning activities. The results of interviews with teachers indicated

that the theme of marine plants was considered quite interesting and very suitable to be applied in kindergartens located in coastal areas because this theme had not existed before and the children's environment was supportive. Another consideration was that there are many mangrove forests and coral reefs that have been damaged

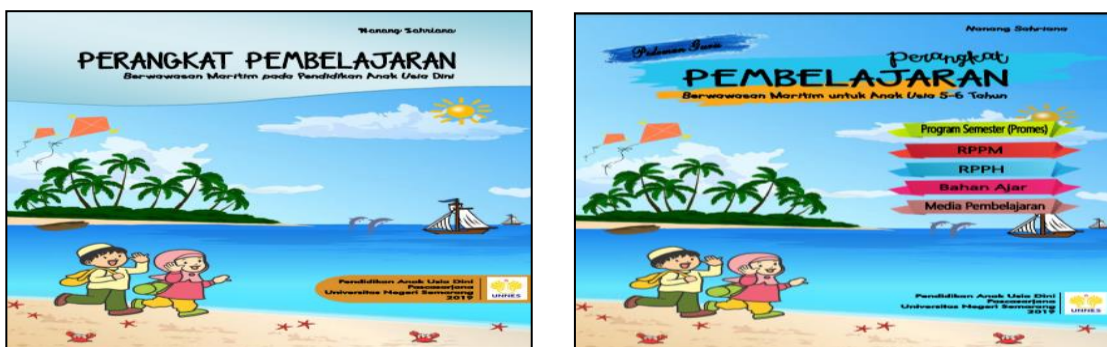
by human activities, which are increasing every year (Susiloningtyas, Handayani, and Amalia, 2018). Seeing this condition, it can be concluded that this theme is very important to be applied to early childhood education. Several tools were needed had been revised as presented in Table 2.

**Table 2.** The Learning Tools Improvement

Learning Tools Aspects	Validators Suggestion	Revisions
Content	The material was adapted to the level of early childhood development Teaching materials were made more specific	Material adapted to children aged 5-6 years  Teaching materials were made into 3 series, namely mangroves, coral reefs, and seaweed
Basic Competencies	Adjust to the 2013 ECE Curriculum	ECE Curriculum
Language	The sentences used were simpler so that children can easily implement them	The sentences used were simpler
Graphical	Lay out appearance was made to be more attractive The picture is clarified	Lay out was made attractive

Suggestions regarding the improvement of learning tools were made to improve the word used to be more simpler, so that make it easier for teacher and students to understand on learning tools. Use material adapted to the level of early childhood education aged 5-6 years. The source of the picture is included both from the internet and printed books. Competencies

adjusted to the ECE curriculum. Teaching materials were made into 3 series, namely mangroves, coral reefs, and seaweed. Besides, improvements were also made to the color arrangement, to make it more interesting, and use striking colors. Improvements can be seen in Figures 1 (a) and (b).



**Figure 1a.** Cover Before-After Revision

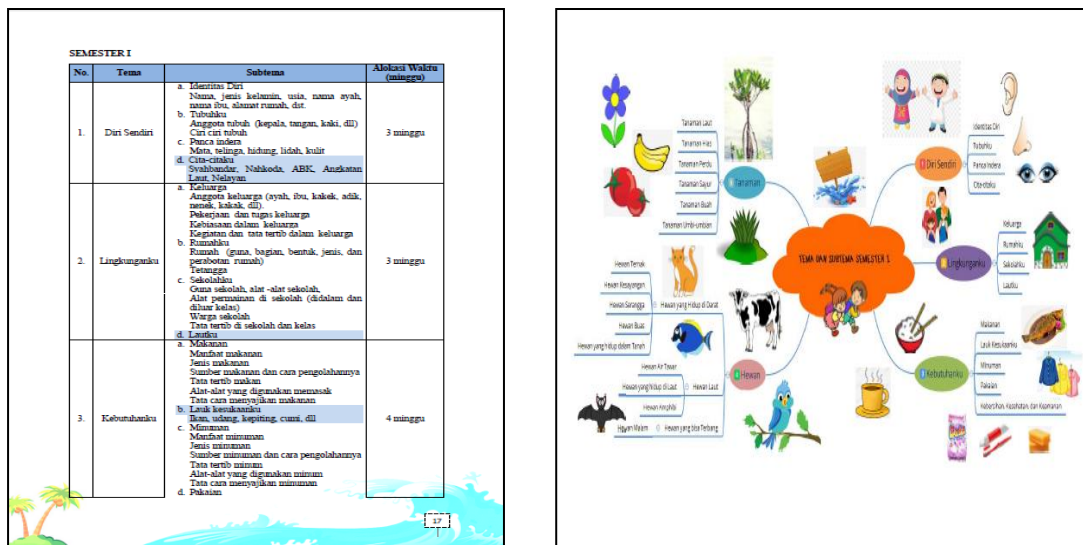


Figure 1b. Teaching Material Before-After Revision

After learning tools is declared valid, the next stage is the trials stage of the application of learning tools into the learning process. This stage is carried out by limited scale and wide scale trials to the classes and is seen to be effective.

**Effectiveness of Learning Tools**

Before testing the effectiveness of maritime insight learning tools, there were several staged to be carried out.

**Hypothesis Test**

Hypothesis testing was carried out using the t-test assisted by SPSS version 24 and the sig results were obtained, 0.000 (2-tailed) for learning outcomes at pre-test and post-test scores. So it concluded that  $H_0$  was rejected.

**Effectiveness Test**

*Limited Scale Trial*

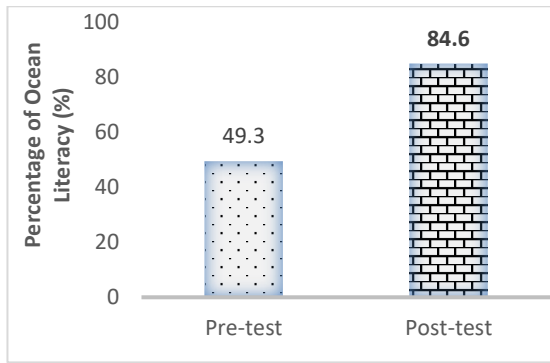
In a limited scale trial on learning tools, 15 students were carried out at Konasara Kindergarten as a sample. Teachers are given maritime insight learning tools that have been developed. The results of the calculation of the pre-test and post-test values can be seen in Table 3.

Table 3. Limited Scale Pre-test and Post-test Results

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	4.9333	15	.96115	.24817
Posttest	8.4667	15	.63994	.16523

Based on Table 3 the sample was used in a limited scale trial using maritime insight learning tools with three learning sub-themes, namely mangroves, coral reefs, and seaweed, namely 15 children. The mean score for the pre-test was 4.93, while in the post-test it was 8.46. This shows an increase in the average value between the initial (pre-test) and the final (post-test) scores. The findings during this limited scale trial were used as consideration to make improvements to maritime insight learning tools in early childhood (5-6 years old).

The results of observations and children's learning activities during maritime learning activities, it can improve ocean literacy in early childhood including aspects of children's marine insight, children's caring attitudes towards the marine environment, and children's behavior towards the marine environment. The increase is presented in Figure 2.



**Figure 2.** The Percentage of Ocean Literacy in Limited Scale Trial

The limited scale trial stage of maritime insight learning tools, several obstacles were encountered, including a) the learning theme that was applied for the first time made children confused, b) there were several terms that children did not understand, because children often used regional languages in communicating with teachers, c) unclear instructions in children's activities, and d) insufficient image size. The findings during this limited scale trial was taken into consideration to be improved.

*Wide Scale Trial*

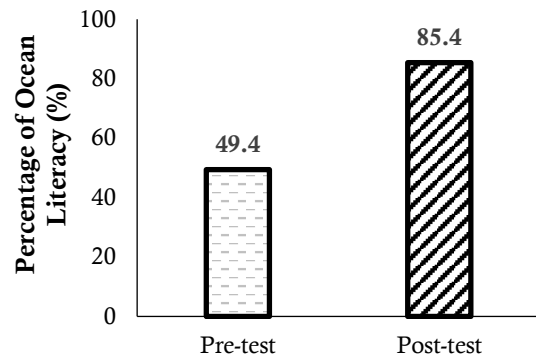
The results of wide scale trial on maritime insight learning tools were carried out by 65 students in five kindergartens, namely Nurul Hidayah Kindergarten, Wisata Tanjung Taipa Kindergarten, Tongalino Kindergarten, Mawar Kindergarten, and Mekar Sari Kindergarten. To find out the average value obtained in the pre-test and post-test, it can be seen in Table 4.

**Table 4.** Wide Scale Pre-test and Post-test Results

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	4.9385	65	1.17096	.14524
Posttest	8.5385	65	.61433	.07620

Based on Table 4 it can be seen that the average value achieved in the pre-test is 4.94 and the average value achieved in the post-test is 8.54. This shows an increase in the average value between the initial (pre-test) and the final (post-test) scores.

Based on the results of observations and children's learning activities during maritime learning activities, it is considered to be able to improve ocean literacy in early childhood. The increase can be seen in Figure 3.



**Figure 3.** The Percentage of Ocean Literacy in Wide Scale Trial

The development of maritime insight learning tools is carried out using the Borg and Gall model which is then adjusted to the research needs. This research is relevant to research conducted by Sulistiani and Mustami'ah (2015) with research subjects in kindergartens located in the coastal area of Kedung Cowek Kenjeran Surabaya, stating clearly that the need for an introduction to marine themes in children around the coastal areas through learning in kindergarten. Alqadri et al. (2018) noted that children as the nation's next generation were needed to have knowledge and skills in maintaining and preserving Indonesia's natural wealth appropriately and wisely.

Fuad and Musa (2017) stated that thematic education a given marine can improve children's interest in the maritime field. Marine thematic education in kindergarten can be started in a way introduction to the maritime profession, tools transportation, biota images and the environment the sea. Hapidin et al. (2018) support this study, researched the integrative thematic learning in implemented maritime education in early childhood education, and concluded that integrative thematic conceptual learning model to be an

alternative and contribute to implement marine education from an early childhood.

The effectiveness test was carried out by comparing the initial score and the final score through the t-test. Analysis of t-test data in this study using the paired sample test. The results of the t-test can be seen in Table 5.

Based on the data, it can be seen that the Asymp Sig. (2-tailed) was 0.000. It means that

$0.000 < 0.05$  with  $H_0$  rejected and  $H_a$  accepted because there is a difference in the average score obtained.

As for knowing the truth of the hypothesis with  $t_{count} > t_{table}$ , which means if  $t_{count} > t_{table}$  then  $H_0$  is rejected, whereas if  $t_{count} < t_{table}$  then  $H_0$  is accepted. Based on the data in table 4, it can be concluded that  $t_{count} > t_{table}$ , namely  $24.808 > 1.998$ .

**Table 5.** Paired Sample Test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pre-test	-							
Post-test	3.60000	1.16994	.14511	3.88990	-3.31010	-24.808	64	.000

The results of the analysis of the test data on the effectiveness of maritime insight learning tools through Asymp Sig. (2-tailed) and t-test it can be concluded that  $H_0$  is rejected and  $H_a$  is accepted where there is a significant difference between children's learning outcomes in the pre-test and post-test. It can be said that this maritime insight learning tool is effective for improving ocean literacy in children aged 5-6 years old and can be used in learning activities in ECE.

The maritime insight learning tools in early childhood (5-6 years old) are an effort to develop a planned learning program to present fun, creative, and interactive learning to help students acquire knowledge of attitudes, knowledge, values, and behaviors that refer to culture maritime. One of the learning themes developed is the theme of marine plants with the sub-theme of mangroves, coral reefs, and seaweed. This is in line with the opinion of Kurniati (2017) noted that the coast is a natural learning media for early childhood. Learning activities are supported by teaching materials and learning media. This study found that the use maritime insight learning tools with a valid can be well integrated through various learning

activities for children in coastal area. Children can improve their understanding of the impact of marine environment on human life.

**CONCLUSION**

Based on the results of research conducted on development of maritime insight learning tools, is proven to increase students' ocean literacy in children aged 5-6 years old. So it can be concluded that the development of development of maritime insight learning tools proved to be valid and effective use in the learning of kindergarten group B (5-6 years old).

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