

## Integrating Madura's Salt Potential into Science Learning Through Pop-Up Book for 4<sup>th</sup> Grade of Ponteh 1 Elementary School

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**Abstract:** Integrating natural potential into learning can support programs to achieve learning completion and increase environmental awareness. Integrated science learning must be supported by several things such as Pop-Up Book. The research aimed to (1) analysis of the integration of Madura salt potential into Natural Resources and Conservation material for grade 4 elementary school in the form of Pop-Up books (2) analysis of student learning activities using Pop-Up books Madura's Salt Potential. The research was conducted by analysing learning materials to be able to integrate the Madura's salt potential through pop-up book. Data instruments used for observed the learning activities was observation sheets in learning activities. The research using the material carried out in 4 times at school. From the research obtained related to the competency analysis carried out to integrate Madura Salt Potential through Pop-Up Books on the material of Natural Resources and Their Conservation. The results obtained were that the material of Natural Resources and Their Conservation can be integrated with Madura salt potential. Learning activities by integrating Madura Salt Potential through Pop-Up Books increased from the 1<sup>st</sup> day, which was 92% for the 2<sup>nd</sup> day to the 4<sup>th</sup> day, which was 96%. This shows that students can integrate Madura Salt potential through Pop-Up Books.

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### INTRODUCTION

Madura as one of the tribes in Indonesia is also rich in cultural treasures, one of which is salt. Madura Island is identical to salt production on a regional and national scale in East Java. Madura is the largest salt producer in East Java and nationally so that currently Madura Island is identical to the Salt Island (Hadi & Ahied, 2017). The development of local potential can be used as one of the efforts to build a dynamic education system that can encourage the development of national character (Dumebi Moemeke, 2014). Meanwhile, the current science curriculum represents knowledge originating from the western world which often forgets things that are close to the social environment and reality of students (De Beer & Whitlock, 2009). So that local potential is still often sidelined and considered inappropriate for students to learn because it will limit access to modern groups (Aikenhead & Ogawa, 2007).

This is a natural potential that is very unfortunate if it is not exposed in a broader form, one of which is in the field of education. Integrating natural potential into learning can support programs to achieve learning completion and increase environmental awareness. The learning system that is implemented must comprehensively combine the concepts and natural potential that exist in the community. The natural environment can also be used as a source of learning by linking the original knowledge of the community with science (Pritasari et al., 2022a). Natural Science is a branch of science based on natural phenomena that will become knowledge if it begins with a scientific attitude and scientific methods.

In science learning, elementary school teachers must be able to present learning in which students not only act as recipients but also experience and feel directly when understanding the knowledge so that later it can be implemented in students' daily lives (Mar Atus Solihah & Yuliansyah Bintaro, 2023). According to (Denessen et al., 2020), one way that teachers can do so that all students in the class can

develop according to their potential is to meet the educational needs of each student by providing adaptive and differentiated teaching. Learning in a broad sense can be interpreted as a psychophysical activity for the development of a complete personality. Then in a narrow sense, learning is intended as an effort to master science knowledge which is part of the activity towards the formation of a complete personality (Ilma & Wijarini, 2017). Integrated science learning must be supported by several things, including the existence of learning media. Media is a tool for teachers in conveying various learning materials to students so that it is easier to convey them. Media is part of the education scheme, media plays a very important role in the learning process, such as providing the same stimulus, creating the same perception, and equalizing students' learning experiences. In fact, students at the elementary school level do not yet have the ability to relate what is around them to the subject matter taught in school. The use of media can also maximize learning and can deliver lesson materials optimally. The importance of teacher in the media has not become a serious concern that the implementation of an integrated contextual thing has not done the maximum. With so many problems are found, it is necessary to develop an Integrated local potential in learning guide that uses, so that can help improve the competence and performance of teachers to plan and manage learning that educate and facilitate learners (Sarmiet al., 2019).

According to (Zhang et al., 2020) the interactive form of the book plays an important role in attracting students' interest in learning. Pop-Up Book learning media, namely books that can move and interact through paper mechanisms such as rolls, folds, wheels, slides, and tabs. The book does not have to explode, but continues to move. A Pop-Up Book is a book that when opened can display 3-dimensional images so that it is more interesting to read (Rakhmawati et al., 2020). The preparation and creation of the Pop-Up Book begins with analyzing basic competencies according to the material needed and then reviewing the contents of the material in depth (Elmunsyah et al., 2019). After that, they began to compile the book framework (Mar Atus Solihah & Yuliansyah Bintaro, 2023).

The Pop-Up Book was chosen as an alternative media because the Pop-Up Book is one of the creative fields of engineering paper that is increasingly popular and developing in Indonesia. Pop Up Books have developed widely in the market, but are still dominated by foreign works/products, while local ones are still very limited (Komari et al., 2022). The advantage of Pop-Up Book media is that it provides a special experience for students because it involves students such as sliding, opening, and folding parts of the Pop-Up Book. This Pop-Up Book media can not only be used during classroom learning, this Pop-Up Book media can also be used in independent learning because the Pop-Up Book media is packaged practically and can be carried anywhere (Komari et al., 2022; Nur et al., 2017). Therefore, learning media are needed that can attract students' attention to science subjects.

The lack of a bridge between Natural Potential such as Madura Salt Potential and Formal Science leads to the neglect of cultural values and local wisdom (Imadudin). Even students become unfamiliar with those from the surrounding community. This evidence will continue to the moral, social, cultural, and natural crises that have caused a humanitarian crisis (Herusatoto, 2012; McInnes, 2017). Based on previous research conducted by the author regarding the development of Pop-Up Book learning media on Pamekasan salt potential for 4<sup>th</sup> grade elementary school students, the results showed that the media developed was suitable for use as learning media (Farhan Amnan Mullisi & Conny Dian Sumadi, 2024). This is important to Integrating Madura's Salt Potential into Science Learning Through Pop-Up Book for 4<sup>th</sup> Grade of Ponteh 1 Elementary School. The research aimed to (1) analysis of the integration of Madura salt potential into Natural Resources and Conservation material for grade 4 elementary school in the form of Pop-Up books (2) analysis of student learning activities using Pop-Up books Madura's Salt Potential. The integration of local potential with science material in the form of a Pop-Up book provides a deeper learning experience.

## METHOD

The research was conducted by analysing learning materials to be able to integrate the Madura's salt potential through pop-up books in science for grade 4 elementary school. This research was conducted at Ponteh 1 Elementary School in Pamekasan Madura. The research sample was 25 students of Ponteh 1 Elementary Schools. The material used in this study is Pop-Up book in Science for Natural Resources and Their Conservation matte by analysis of standard competency. The Pop-Up Book that used

was developed by the author and teams using ADDIE Model. Based on the previous research, the research results showed that the validity Pop-Up Book from material expert obtained 87.5% (very valid), media expert obtained 98% (very Valid) (Farhan Amnan Mullisi & Conny Dian Sumadi, 2024). Data instruments using observation sheets in learning activities. The research using the material carried out in 4 times at school. The proposed learning method in this study tended to have long time to collect data to complete the study than the other experiment research. The results are calculated based on the result test of samples. Research was carried out in several ways, that are data collection, analysis and application (Ritonga et al., 2022). Data collection was obtained from the syllabus, elementary school student books, relevant articles, and observation sheets of student learning activities using Pop-up books. The analysis was carried out by reviewing documents, in addition to providing sufficient understanding and explanation of Pop-Up Books as learning media. The data obtained were then interpreted according to the predetermined classification, namely analysis of learning objectives and also analysis of student learning activities using Pop-Up books. The method of the research shown in Figure 1.

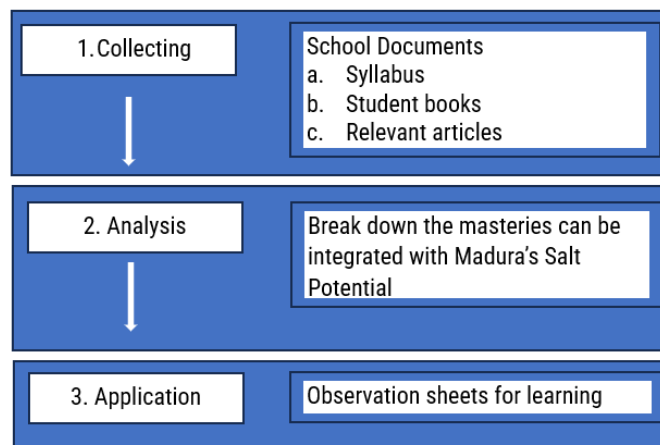


Figure 1. Research method

## RESULT

The result of this study was obtained from the analysis of research using instrument developed are:

### Analysis Standard Competency

Based on the documents that have been collected, Ponteh 1 Pamekasan Madura Elementary School has implemented Merdeka Curriculum. The Merdeka Curriculum makes science material not stand alone but become one with social studies which is called Social Natural Sciences. There are several chapters studied in 4<sup>th</sup> grade, including: (1) Changing the form of energy; (2) Forces around us; (3) This is where I live; (4) Climate and its changes; (5) This is typical of my region; (6) My role in the school environment and society; (7) Cultural diversity and local wisdom; (8) Becoming an environmental hero (Amalia Fitri et al., 2023).

Because science does not stand alone, several chapters above are then analysed to determine the potential of nature such as the potential of Madura salt can be included in which chapter. One of the appropriate chapters is in chapter 5 This is Typical of My Region. The material presented in this chapter can be integrated with the potential of Madura salt because there is material that discusses natural resources and their preservation. The results of the integration are presented in Table 1. Learning Objectives, as follows.



Figure 2. Pop-Up Book Madura's Salt Potential (Farhan Amnan Mullisi & Conny Dian Sumadi, 2024)

Table 1. Learning Objectives

Learning Objectives of Pop-Up Book	
4.1	After studying the Pop-Up book Madura Salt Potential, students can identify types of natural resources in the surrounding environment
4.2	After studying the Pop-Up Book Madura Salt Potential, students can explain various ways to preserve and/or utilize Natural Resources in the form of Madura Salt Potential in the surrounding environment sustainably

### Learning Activity Analysis

Implementation of the learning activity is the implementation of lesson using Pop-Up Book Madura's Salt Potential. The result of the research shown in Figure 2.

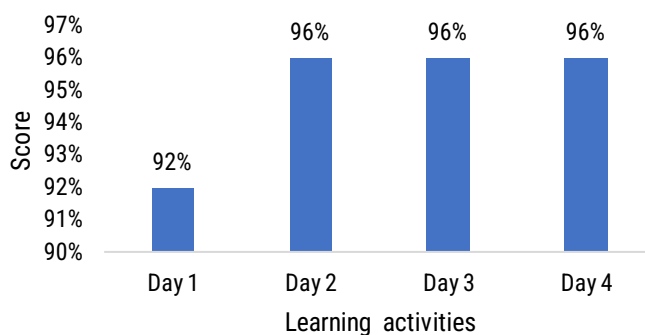


Figure 2. Learning activities using Pop-Up Book Madura's Salt Potential

### DISCUSSION

Madura Island is a major salt producer with salt centers in four districts, namely Sampang, Pamekasan, Sumenep and Bangkalan. Based on land area, salt ponds in Madura reach 30% of the national salt pond area (Dania Hidayati, 2020). Pamekasan Regency is the largest salt producer in East Java (Hidayah et al., 2023) and is one of the natural resources there. Pop-Up Book Potential of Madura Salt used in this study is a media that has been developed by the Author and team. The development of Pop-

Up Book at Ponteh 1 Elementary School, Pamekasan, Madura is based on the results of the analysis conducted at the school. From the results of interviews and observations of grade IV teachers at SDN Ponteh 1, it is known that when delivering learning materials, teachers use more independent curriculum books provided by the government so that students become passive. When viewed from student interest, the use of visual learning media with pictures can help students be more active in class. Therefore, pop-up book media is an interesting learning media and is suitable to be developed because it has been tested and can be used by teachers in the learning process (Farhan Amnan Mullisi & Conny Dian Sumadi, 2024).

Integration of local potential in learning does not just appear, but there is a reference that underlies it. The reference used is at least in two things, namely learning as one aspect of fulfilling educational goals and the legal basis of national education policy. Education is a learning program, in short, a basic element of behavioural change (education) that takes place both inside and outside the classroom as an interaction between learners, teachers in a certain environment (Zuhdan Kun Prasetyo, 2013). The legal basis for national education policies that highlight the region's superior potential, including:

- a. Government Regulation Number 17 of 2010 Article 34 states that "Local excellence-based education is education that is organized after fulfilling National Education Standards and enriched with regional competitive and/or comparative advantages."
- b. Government Regulation Number 17 of 2010 Article 35 paragraph 2, that "The district/city government implements and/or facilitates the pioneering of educational programs and/or units that have or almost meet the National Education Standards to be developed into international standard educational programs and/or units based on local excellence".
- c. The 2010-2014 National Education Ministry Strategic Plan states that:  
Education must foster an understanding of the importance of sustainability and ecosystem balance, namely the understanding that humans are part of the ecosystem. Education must provide an understanding of the values of social and natural responsibility to provide students with an overview that they are part of a social system that must synergize with other humans and part of a natural system that must synergize with nature and all its contents.

Education that integrates local potential in it aims to connect new content with existing knowledge about what students already know in the environment. Existing knowledge related to local potential will make it easier for teachers to connect new knowledge to be taught to students (Reka Nurjanah et al., 2024). In addition, education based on local potential provides opportunities for students to understand the conditions of regional potential historically and in the future. Regional potential is used as a learning resource to encourage students to be interested in studying material that will ultimately foster awareness to manage nature and be able to overcome problems in nature (Destiara, 2020). The integration of Madura salt potential in learning has life values that can be learned and collaborated in learning (Imaduddin et al., 2020). This integration in learning not only provides advantages in the skills mastered by students, but also a form of contextual character strengthening efforts.

A conducive learning atmosphere and environment can be created for learning, of course, unlimited or in other words diverse, but from one point of view, for example from the perspective of context, students will be more appropriate if they optimize local genius, local wisdom or local excellence (Zuhdan Kun Prasetyo, 2013). According to (Pritasari et al., 2022b), learning with contextual character education reinforcement is a learning approach that utilizes the potential of the natural environment and cultural wisdom throughout the archipelago as a strength to design learning activities and experiences in order to develop individuals who have their own identity and have various abilities to face global demands. In other words, the design of the learning process that helps children develop themselves into true Indonesian people who are also ready to become world citizens (Sarmi et al., 2019). Integrating into a region's distinctiveness in education refers to the ability of educators and educational institutions to interact effectively with and support individuals from diverse cultural backgrounds (Horvat et al., 2014). This competency encompasses a range of knowledge, skills, and attitudes that enable educators to understand, appreciate, and respond to existing potential in meaningful ways. Developing communication, teaching, and relationship-building skills that facilitate effective cross-disciplinary interactions. Adapting teaching practices, curriculum materials, and classroom environments to meet the needs and preferences

of diverse learners (Chima Abimbola Eden et al., 2024).

The factor that causes the low indicator of learning activities is that the material given by the teacher to students is not yet integrated, still fragmented between science material and local potential, in other words when teaching a theme, the teacher tends to explain the substance of the material universally. (Chima Abimbola Eden et al., 2024). This happens on the first day of learning activities so that students are less aware that the potential of Madura salt is a material that is part of learning (Farhan Amnan Mullisi & Conny Dian Sumadi, 2024). Natural Science (IPA) learning is considered relevant in shaping students' character to care about their environment so that in teaching IPA, we can utilize the environment as one of the learning resources. IPA learning will direct students to better understand the importance of preserving the environment (Cahyani & Djudin, 2024). IPA learning by integrating natural potential around the school is an effort to instill local wisdom values to children from an early age. Teachers are also asked to improve the quality of learning through various types including ethnic study knowledge (Abshor, 2023). The pop-up book media facilitates the presentation of key topics in a three-dimensional format, thereby increasing student understanding and retention (Faradilla & Rahmawati\*, 2024). The use of products directs students to learn more actively and be more motivated to learn to follow science learning. The products presented can help teachers explain learning materials. Products are also designed to suit students' needs in understanding abstract learning materials more concretely. In addition to being used during classroom learning, pop-up book media can also be used in independent learning because pop-up book media is packaged practically and can be carried anywhere (Nur et al., 2017)(Farhan Amnan Mullisi & Conny Dian Sumadi, 2024).

Based on the figure 2 the result of the learning activities in 1<sup>st</sup> day got 92%. The result on the 2<sup>nd</sup> to 4<sup>th</sup> days were increased became 96%, students have started to carry out integrated learning activities on the potential of Madura salt through pop-up books. By doing this, learning materials can be better understood by students and allow them to take control and achieve learning objectives (Hidayati et al., 2018). This combination brings science principles into concrete situations that reflect everyday life that students know, thus stimulating things in contextual situations (Connolly & Cosgrove, 2022; Lerman, 2014). Integrated natural science learning has enormous potential to improve the quality of learning. By actively involving students in observing, exploring, and analysing the surrounding environment, learning becomes more interesting and meaningful (Cahyani & Djudin, 2024). Hopely, students will find it easier to connect school science materials with their daily lives based on natural learning resources and social culture. The better the student's understanding of science concepts or principles at school, the better their way of thinking about natural phenomena in daily life. The better understanding of natural phenomena found around students, the easier it is to understand the concept of school science (Imaduddin et al., 2020). As a concept, this natural potential becomes a benchmark and underlines the importance of their own philosophy, heritage, and educational process. Local knowledge fills the gap of ethics and knowledge in education and research. The process of generating or learning a way of life by integrating natural potential is a journey towards wisdom or a journey of wisdom in action, not a destination to find knowledge (Aikenhead & Ogawa, 2007).

## CONCLUSION

In this study, data was obtained related to the competency analysis carried out to integrate Madura Salt Potential through Pop-Up Books on the material of Natural Resources and Their Conservation. The results obtained are that the material of Natural Resources and Their Conservation can be integrated with Madura salt potential. Learning activities by integrating Madura Salt Potential through Pop-Up Books increased from the 1<sup>st</sup> day, which was 92% for the 2<sup>nd</sup> day to the 4<sup>th</sup> day, which was 96%. This shows that students can integrate Madura Salt potential through Pop-Up Books. Integrating local potential in learning does not just appear, but there is a reference that underlies it. The reference used is at least in two things, namely learning as one aspect of fulfilling educational goals and the legal basis for national education policy. The integration of local potential with science material in the form of a Pop-Up book provides a deeper learning experience. This combination also brings science principles into concrete situations that reflect everyday life that students know, thus stimulating things in contextual situations. The limitation of

this research is that it has not been able to analyse the competencies in elementary schools to be integrated with the potential of Madura salt. In addition, the research study area can be expanded throughout Madura Island. This community knowledge can be used as a reference source to contextualize the science that students learn in school. Thus, in the future, science learning resources can be further developed.

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