



Research article

Rajeboning Infographic Project Based Outdoor Learning: Efforts to Use the Liang Ulin 2 Site as a History Learning Source

W D Sulistyo*, B Suprapta, U Nafiah, D N Wijaya, and A R Nabila

History Department, Faculty of Social Science, State University of Malang, East Java, Indonesia

Abstract.

Interaction with many learning resources and motivated students are some of the indicators of ideal historical learning. The concept of Rajeboning (infographic project based outdoor learning) can be used to support historical learning. Furthermore, examining Liang Ulin 2 (which is still unexplored) and its artifacts can help to spur historical learning. This research involved the five steps of historical research (topic selection, heuristics, criticism, interpretation and historiography), as well as a qualitative research-based literature study. The archaeological and historical potential of Liang Ulin 2 can be reviewed from the findings of artifacts which include: stone artifacts (lithic), earthenware shards, jewelry, shells, bones, teeth, and ochre. The utilization of the Liang Ulin 2 Site as a historical source using the concept of Rajeboning consists of three stages: session 1 (orientation); session 2 (execution); and session 3 (appreciation). The three sessions are expected to motivate students and thus realize the real purpose of historical learning.

Keywords: Liang Ulin 2, learning resource, Rajeboning, outdoor learning, project-based learning

Corresponding Author: W D Sulistyo; email: wahyu.djoko.fis@um.ac.id

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1. Introduction

Located at the southeastern tip of Kalimantan Island, there is Tanah Bumbu Regency which has several historical traces in the form of prehistoric karst cave sites. Tanah Bumbu Regency is an area that has a complex topography, consisting of lowland areas (including mangroves and swamps), highlands, mountains, rivers and coastal areas. Based on the altitude classification, Tanah Bumbu Regency is dominated by plain slopes (0 -100 m above sea level). While the hillsides (> 100 - 500 m asl) and the Meratus Mountains (> 1000 m asl) are only scattered in the northernmost part of Tanah Bumbu Regency [1]. The northernmost area of Tanah Bumbu Regency is Mantewe District. It was in Mantewe District that prehistoric karst caves were found scattered in five villages that are included in the administrative area, namely Mantewe Village, Bulurejo Village, Rejosari Village, Dukuhrejo Village, and Sukadamai Village [2]. One of the karst cave

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sites in Mentawai District is Liang Ulin 2 which is located in the Bukit Ulin cluster, Sukapeace Village, Mentawai District. Among the three caves found in Bukit Ulin, Liang Ulin 2 is the area that is considered to have the most archaeological data. Because the Liang Ulin 2 area has not been disturbed by the activities of the cave-digging community [3]. The findings of the artifacts and conditions of Liang Ulin 2 that have not been widely touched have become a suitable climate for recognizing, understanding, and reconstructing prehistoric human life that once took place there.

History is the result of reconstruction of the past. There are three important elements in history, namely humans as historical actors, space as a place for historical events, and time as a process of historical events. Reconstruction of the past will be easier if it is supported by traces of these elements which are the primary sources of history. As a result of reconstruction, history is not made for the sake of the past (antiquarianism) but also for various other interests such as education [4]. Efforts to develop students' thinking skills (how to learn) cannot be formed only by interactions between teachers and students in the classroom. In the learning process, students also have to interact with many other learning resources - such as the natural environment, social communities, cultural sites, and so on - related to activities in the field [5]. The more ancient the historical material being taught, the longer the time gap between the content of the material and the soul of the students being taught. This applies in learning prehistoric material [6]. Organizing outdoor learning in the form of historical site visits such as Liang Ulin 2, will encourage students' motivation to learn about the material in guestion. In the future, outdoor learning activities that involve students to be able to do research accompanied by this teacher, aim that students not only know historical facts, but more than that students can interpret history [7].

History learning in schools serves to develop knowledge, understanding, critical thinking, practical skills, interests and behavior [8]. Ideally, good history learning is learning that is able to grow students' abilities in constructing the relationship between present and past conditions. Such an intellectual history learning must involve students' activeness in teaching and learning activities [9]. An alternative solution to make it happen is through the use of learning models that support these principles. Among the learning models that support the principles of intelligent learning are project-based learning. The project-based learning model encourages students to have high-level thinking oriented to problem-solving activities and express ideas more openly [10, 11].

Through project based learning, students' skills in analyzing, researching, creating, and presenting learning products based on real experience will be more critical and will increase [12, 13]. In this case, the project that will be given to students is an information graphic (infographic). Graphic information (infographic) itself is a concept of presenting information in which it is wrapped with creativity, accuracy of information with



illustrations, and other elements that attract attention. Infographics can make complex information simpler and easier to understand [14, 15]. Through the project of making infographics, students can learn to process the information (knowledge) obtained in learning. Information processing activities will require students to hone critical thinking skills, namely analysis and synthesis - as well as generalizing data [16]

The collaboration between outdoor learning and infographic project based learning was then called "Rajeboning" (Infographic Project Based Outdoor Learning). "Rajeboning" is expected to be an alternative solution to problems related to history learning which only focuses on learning theory in teacher center classes. Finally, this article entitled "Project Based Outdoor Learning for Historical Studies: Efforts to Utilize the Liang Ulin 2 Site as a Learning Resource" aims to convey the real context of the above idea.

2. Method

The method used by the author to explore the archaeological potential of Liang Ulin 2 is a historical research method consisting of: (1) topic selection; (2) heuristics: collecting data sources that the authors obtained from books, articles and journals resulting from archaeological research on the site in question and the surrounding environment. As supporting information regarding the existence of the Liang Ulin 2 site in Mantewe Regency, the author also collects data from the Mantewe Regency Government documents contained on the government website. These data sources author access in the network; (3) criticism (verification): the process of testing the authenticity, truth, validity of the data. (4) interpretation: the process of assembling facts (synthesis and analysis); (5) historiography: the presentation of history in a logical and systematic written form [17].

Regarding the urgency of using historical sites as learning resources by using a collaborative outdoor learning model and infographic project based learning, the author uses a qualitative research method based on literature study. That is, writing this article through a series of activities to collect, read, write, and process research materials using literature (library) [18].

3. Result and Discussion

3.1. Archaeological Potential and History of Liang Ulin Site 2

Liang Ulin 2 is a prehistoric cave site located in the southeastern karst region of the Meratus Mountains [19]. Based on its morphology, the karst cave, which is located in



the Bukit Ulin cluster, Sukapeace Village, Mentawai District, has three terraced terraces. The three terraces of Liang Ulin 2 have archaeological potential, it's just that the most archaeological data is found on terrace 3. Terrace 1 is located at a height of 1-2 meters from the surrounding ground surface. The condition of the lower terrace floor tends to be humid, because the chemical activity of the formation of cave ornaments is still ongoing today. The stalactites, stalagmites, and pillars of the Liang Ulin 2 cave continue to grow. Under this terrace there is also a passage that used to flow water. About 3-5 meters from terrace 1, there is terrace 2. Terrace 2 is divided into two more terraces. On terrace 2a there are many stones from the collapse of the roof of the cave. The condition of the terrace floor 2a is dry in the form of sand with fine grains. In contrast, terrace 2b is moist, because the stalactites and stalagmites that are there are still active. The condition of terrace 3 where a lot of archaeological data was found is almost the same as the condition of terrace 2a. Terrace 3 floors are relatively flat, dry, and dominated by fine-grained sand. The intensity of light and air circulation in it is quite good. The rest, terrace 3 can protect from heat and rain [3]. Kondisi lingkungan yang demikian sangat ideal untuk dijadikan sebuah hunian [20].

Archaeological data found at the Liang Ulin 2 site include: lithic artifacts, pottery shards, jewelry, shells, bones, teeth and ocher. The lithic artifacts found at Liang Ulin 2 were made using chert, jasper, limestone limestone, quartzite, andesite, and basalt. Chert, limestone, and jasper are the most widely used. This is influenced by the main factors in choosing the type of material, namely: (1) economic factors, referring to the distance, time, and energy required to obtain raw materials; and (2) opportunistic factors, referring to the lack of desire to create unique equipment, but only prioritizing quantity to meet the necessities of life as necessary. Chertstone, limestone limestone, and jasper are types of sedimentary rock. In karst areas, both are possible to form from limestone that has undergone a silicification process. The chert stone itself is often found on the banks of the river at the mouth of the Liang Ulin 2 cave. The types of lithic artifacts found at the Liang Ulin 2 site consist of cores, flakes – with various shapes of shaved, and discharge [21].

Core stone is a piece of stone trimmed from its original place which is used to make stone tools [22]. While shale is a stone fragment that is separated from the core stone (when making stone tools) and has retus (modification / rework on certain sides to get the desired sharpness shape) [23]. The types of shale (shaving type) found include side, convex, concave, distal, proximal, and many-sided. Based on the analysis that has been done, the flake tool functions to shave tree bark, cut meat and plants, peel tubers, and skin animals. The chips are waste from the process of trimming stone tools that do not have the characteristics of shale - either produced from trimming core stone or shale. Therefore, the chisel has an irregular shape [21].



Figure 1: Liang Ulin Cave Floor 2 Terrace 2a.

Another artifact found in Liang Ulin 2 is a pottery shard (fragment). The Liang Ulin 2 pottery shards consist of the neck, body, base, edges, ears, and carnations. Body parts are the most commonly found. The pottery body of Liang Ulin 2 has a thickness that varies from 0.3-10.75 mm. There are two types of Liang Ulin 2 pottery bodies, namely plain and decorative motifs. In some of the findings of the body of Liang Ulin 2 pottery, there are marks of use in the form of black (burned). This indicates that Liang Ulin 2 pottery is not only used as a container, but also for cooking purposes. Like the pottery body, the base of the pottery found also consisted of two types, namely the round base and the ring base. The diameter of the base of the pottery starts from 4-11.75 cm. Another pottery part found in several types is the ledge. The rim of Liang Ulin 2 pottery is between 7-32 cm in diameter and has three types based on the folding direction, namely the folded edge, the folded edge in, and the straight edge. Another part that is unique is the ear. The Liang Ulin 2 pottery chip has the shape of the letter L with the elbows facing outwards and has geometric decorative motifs in the form of parallelograms. The geometric ornaments found in other Liang Ulin 2 pottery fragments include: parallel lines formed by the scratch technique, rhombus (tera technique), and small circles. Besides being decorated with geometric motifs, there are also pottery decorated with red slips. Based on the surface analysis, Liang Ulin 2 pottery was made



Figure 2: Liang Ulin Cave Wall 2 Terrace 3.

using massage techniques (to attach the base and ears to the body), slow turning wheel and face peladas (to make the body and edges)[3].

Liang Ulin 2 jewelry artifacts in the form of beads and necklace pendants made of stone and bone. The shape of Liang Ulin 2's beads include: pipes, convex cones, seven-sided mace cones, and octagonal club cones. The necklace pendulum found was shaped like a key. Jewelry itself in prehistoric times was used as a symbol of social status. The next artifact is a clam shell. The shells found at the Liang Ulin 2 site are a group of animals from the phylum mollusca (class bivalves and gastropods). The shells of the bivalves class come from the families pharidae (saltwater clams) and Unionidae (river mussels). While the shell type of the gastropod class (snail) Liang Ulin 2 consists of the cyclophoridae (land snails), neritidae (saltwater snails), hydrobiidae (mud snails), viviparidae (river snails), thiaridae (trumpet snails), pleuroceridae (tall shell snails). pointed), Lymnaeidae (pond snails), planorbidae (ramshorn snails/ram horns). The gastropod class shell finding is dominated by freshwater snails [24].

Liang Ulin 2 bone artifacts were found in the form of a spoon and a taper. Bone spatulas are made of cleaved bone. Based on the analysis of its function, the Liang Ulin 2 spatula is divided into two: (1) small and thin spatulas are used for cutting, shaving, skinning, and tearing; (2) a concave spoon functions like a spoon. The Liang Ulin 2 bone taper is a pointed tool used as a scallop meat picker. In addition to the modified bones,



the vertebrae of a wild boar (suidae), parts of the carapace and plastron of turtles, fish spines and crab claws were also found. Other animal parts found were tooth fragments of the suidae family (wild boar) and bovidae, split-hoofed animals (split-hoofed animals). Human dental artifacts were also found at Liang Ulin 2. The human teeth found consisted of premolars (the teeth behind the canines) and molars (molars) with worn-out crowns that looked flat. The last type of artifact found at the Liang Ulin 2 site was red ocher. Red ocher is a natural dye made from the oxidized mineral hematite. The use of ocher is evident in the red slip motif on pottery fragments [3,24].

A collection of artifacts found at the Liang Ulin 2 cave site indicates that there was human activity in prehistoric times there. Starting from lithic artifacts (core stone, shale, and chip) and bone (taper and spatula), all three are the result of human modification. Shredding tree bark, cutting meat and plants, skinning animals, gouging shellfish, these activities stimulated them to create tools that could make their work easier. The findings of pottery that have been used (blackish burn) indicate that humans are familiar with food processing using fire (cooking). That is, the manufacture of stone and bone tools, as well as pottery is evidence of the way humans use the surrounding environment to meet their daily needs in the form of food and clothing. The location of the discovery of artifacts in Liang Ulin 2 itself has answered the fulfillment of human needs in the form of a place to live. The results of the culture above were used by prehistoric humans to process animals and plants obtained from the surrounding environment. Animal bones and shells are archaeological data that have been found as evidence of what was consumed by prehistoric humans at the Liang Ulin 2 site. The evidence that explains human presence at the Liang Ulin 2 site is the finding of tooth fragments, skeletons, and human skull bones. . The identification results resulted in the fact that the skeleton found in Liang Ulin 2 consisted of three children and three adults of the Mongoloid race. [19, 25].

3.2. Schematic of Utilizing the Liang Ulin 2 Site as a History Learning Resource Using the Rajeboning Concept (Infographic Project Based Outdoor Learning).

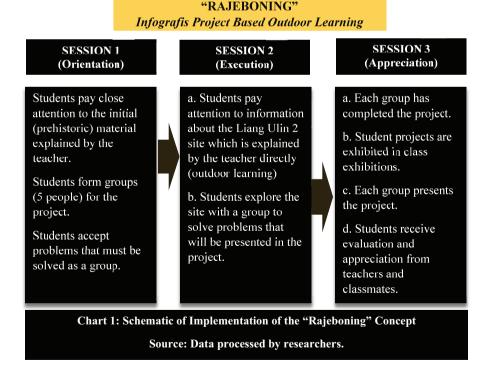
Learning resources are everything in the form of people, data, methods, media, to the place where learning takes place that can be used to facilitate students in learning [26]. The Liang Ulin 2 site as a historical learning resource implies the use of all educational resources from the site in question to facilitate student learning of historical material that is correlated with it. The application of the Liang Ulin 2 Site as a history learning resource is intended for class 10 history subjects with specialization in Basic Competence (KD)



3.4 "understanding the results and cultural values of Indonesian pre-literate people and their influence on life in the immediate environment".

KD 3.4 always goes hand in hand with KD 4.4, both of which are benchmarks for the success of learning on the same material with different intellectual levels. If KD 3.4 invites students to think about a knowledge, then KD 4.4 is an applied phase for students to be able to process what they already know (skilled at creating and presenting something). The concept of "Rajeboning" allows students to get the maximum opportunity to explore their knowledge and skills. Through outdoor learning, students can reconstruct their own knowledge based on the accuracy of the information that has been collected from their experiences in interacting with the environment as well as learning resources [27]. And through project based learning, students can be motivated to solve problems critically, suggest solutions, and negotiate opinions in groups. This kind of learning process directly invites students to be active, reflective, collaborative, and likes to share learning experiences [11]. "Rajeboning" (Infographic Project Based Outdoor Learning) is a new alternative in history learning that combines the two.

Because good and structured planning is needed for smooth learning, here is a scheme for implementing the "Rajeboning" (Infographic Project Based Outdoor Learning) learning concept:



There are three stages in the implementation of the concept of "Rajeboning" (Infographic Project Based Outdoor Learning), namely session 1 (orientation), session 2 (execution), session 3 (appreciation). The 1st session is orientation. Orientation is an

introduction to learning sessions for students. Starting from the material, the learning model used, to the learning method. In this case, the material used is prehistoric material. The learning model used is a collaboration between project learning and outdoor learning. The learning methods used include: lectures, group assignments to make infographics, presentations, and exhibitions. Next session 2 is execution, which is the heart of the concept of "Rajeboning". The execution session requires students to always be active in learning. Exploring the site, solving problems, and processing information based on critical thinking skills (in groups) to create infographics, are a series of activities in the execution session. At this stage, the cooperation of each group member is needed for problem solving and project completion. The presence of elements of group cooperation in the learning process itself is very important. Group collaboration can be a moment to exchange ideas and ideas, strengthen interaction and communication, as well as an opportunity to gain experience in new roles in different groups [28]. Because the project is based on assignment, at this stage the teacher can assess the affective aspects of students in terms of cooperation in a group.

The last stage is session 3, namely appreciation. Includes project collection activities, project exhibitions, project presentations, and evaluation and appreciation from teachers and classmates. Procurement of exhibitions of project results in class aims to motivate students to work on projects seriously [29]. The rest, holding an exhibition of project results will create an active learning atmosphere. Not only teachers can evaluate and appreciate the results of student projects, students can also give appreciation in the form of constructive criticism and suggestions from one another. With an active learning environment (student center), the concept of "Rajeboning" is expected to realize the objectives of history learning which include: (1) students can understand history critically and analytically as knowledge and events - and use this understanding to examine changes in society; (2) students can have historical awareness - so they are able to appreciate time, learn from past mistakes, sort out and imitate good values in life [30] Finally, before the concept of "Rajeboning" is implemented, several things are needed to be prepared carefully. The preparation includes: the limits of the material to be taught to students, parts of the site that can be reached by students (field survey required), and relevant learning evaluation tools. If all three have been implemented, it is certain that the concept of "Rajeboning" can be implemented in history learning.

4. Conclusion

Liang Ulin 2 Cave as a trace of prehistoric human habitation with various archaeological remains has great potential to be used as a learning resource. The concept of "Rajeboning" (Infographic Project Based Outdoor Learning) offers an alternative solution in



the context of utilizing the Liang Ulin 2 site as a source of history learning. There are three sessions in its implementation. Session 1 (orientation) is the introduction of material, learning models, and learning methods. Session 2 (execution) consists of a series of activities that require students to be active in the form of exploring sites, solving problems, and making infographics. And session 3 (appreciation) includes project collection activities, project exhibitions, project presentations, and evaluation and appreciation from teachers and classmates. The concept of "Rajeboning" seeks to place students at the center of history learning. Student activity as the heart of the implementation of the concept of "Rajeboning" is expected to realize the essence of the learning objectives themselves.

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