

Interactive Map and Videosphere-Based Discovery Learning Model Design for Paleolithic Sites in South Kalimantan for History Learning

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Technology in learning has a very important role. The history learning process will take place effectively with the use of technology. The limitation of learning resources in prehistoric learning is a problem that must be solved. This is the reason for developing a learning model based on roaming historical sites virtually, without having to go directly to the location. This is considered effective considering the remote location of the site, the lack of historical teaching aids, and the lack of analytical knowledge of students and teachers. The area that stores the location of historic sites in prehistoric times is in the province of South Kalimantan, where this province stores dozens of prehistoric sites that require conservation efforts, and the form of preservation is through education by digitizing sites with learning technology. This research uses development research with stages: analysis, design, development, implementation, evaluation (ADDIE). In this study developing a learning model that combines discovery learning with Jaraskala which is assisted by Petersphere media. The findings of this study include two things, first regarding prehistoric data in South Kalimantan, the second is the design of a history learning model using technology-based sites.

Keywords: learning model, virtual roaming, prehistory, South Kalimantan, discovery learning

INTRODUCTION

Technology in the current era is very massively developed, ranging from information technology, industrial technology, agricultural technology and so on. The massive development of technology today, technological developments in the world of education must also develop massively (Fitzgerald et al., 2014; Purnomo et al., 2021; Simarmata et al., 2020). With the presence of a learning process that utilizes technology, it will have a good impact on the development of the students themselves. The presence of technology can be implemented in the development of learning models, so that the learning models that will be applied in the classroom will be more relevant to the times (Adeoye et al., 2013; Sutiah, 2020; Wahyuddin et al., 2022). The learning model itself is a plan or pattern that is used as a guide in compiling and planning learning in the classroom, so that the learning model refers to the

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approach used, which includes the objectives, stages, environment, and classroom management (Arisanty et al., 2018; Norberg et al., 2011).

Based on the national curriculum, prehistoric material in Indonesia is the first material taught in Indonesian History subjects at the high school/equivalent level, in the first semester of class X. Prehistoric material is very difficult material to teach, considering that the only source in the learning process is textbooks (Hasan, 2003; Wiradnyana, 2018). The majority of prehistoric material is very subjective when compared to other historical sources. The lack of historical evidence and sources makes historiography in the prehistoric era very difficult because it does not leave written evidence, so that it has an impact on prehistoric materials in class (Ahmad, 2016; S. Jati et al., 2020; S. S. P. Jati, 2015). In the curriculum, prehistoric material is studied in basic competence (KD) 3.4 Indonesian History class X.. So that by including the material in the prehistoric period in basic competence, the material must be taught in class, which of course the learning model is carried out effectively and fun (Arisanty et al., 2018).

Historical sources or places where prehistoric objects are located are not evenly distributed in every city in Indonesia, few finds of prehistoric artifacts found in Indonesia are also added to the location of the discovery that is difficult to reach and the location of sites that are far apart and concentrated in one area only (Bradley, 2002; Nooryono, 2009). Unlike the sites of ancient and colonial Indonesia which are evenly distributed in almost every city in Indonesia. Based on this, it will also affect prehistoric learning resources, which of course not all students in Indonesia can study directly at the site location. The existence of these problems, the teacher as a facilitator is expected to be able to present the nuances of prehistoric learning that is more fun, effective, and contextual without having to come to the site location. The model that can be applied to answer these problems is a model that collaborates with learning technology. The combination of interactive maps and videosphere (Petersphere) is a learning model that involves technology in the process of internalizing the material. Interactive maps and videosphere are media that allow students to virtually explore site locations, without having to go to sites that have difficult terrain and are far apart. So that in essence learning activities will be carried out in the classroom indoors. The interactive map will act as a material provider or introduction to the videosphere, the interactive map will be designed as attractive as possible so that students are interested in exploring archaeological sites virtually. Videosphere will then act as the main material, which contains substance about ancient sites, this videosphere uses virtual browsing videos that can be viewed in all directions with a 360 degree angle. Furthermore, the combination of interactive maps with the videosphere will later become a digital technology-based learning model in the classroom, which is then combined in a discovery learning model. Discovery learning is a learning model that encourages students to think critically to solve problems by conducting searches and discoveries (Fisher, 2011; McPeck, 2016; Sari et al., 2019; Suhirman et al., 2021). So that in this case students conduct searches using digital media that has been developed, namely Petersphere. History learning with a model like this is history learning that will activate many of the students' senses in their learning activities, so that this learning is considered suitable for improving students' cognitive as well as psychomotor (W. D. Sulisty, 2019; W. Sulisty & Kurniawan, 2020).

Prehistoric era teaching material is one of the materials that exist in Indonesian history subjects, where prehistory itself is a chapter in the earliest history of Indonesia, and a historical period when humans were not familiar with the writing system as a means of communication (Madjid & Wahyudhi, 2014). Prehistory in Indonesia ended in the 5th century after the discovery of the earliest written evidence in Indonesia, namely the Yupa inscription. South Kalimantan is one of the provinces at the southern tip of the island of Borneo which has archaeological sites in the prehistoric era which are very supportive to be used as learning materials, especially to be implemented in this learning model (Wahyono, 2020). One of the prehistoric sites in South Kalimantan is in the Riam Kanan River, in Banjar Regency

(Wahyono, 2020). The sites found in the river are the Awang Bangkal site, Rantau Balai and Pulau Sirang. In addition to the area, there are also prehistoric sites, namely the Liang Ulin site, the Pig Cave site, and the Liang Carcass site. These prehistoric sites in South Kalimantan are the oldest sites in Kalimantan, numbering in the tens.

There are various kinds of prehistoric archaeological evidence found, the tools are characterized from the paleolithic period or old stone. The Awang Bangkal site was accidentally found by a square pickaxe by gold miners at that location (Fajari et al., 2018). Archaeological finds were also found in the village area of Rantau Balai, namely equipment that has the characteristics of tools from the Paleolithic period. Based on records of archaeological finds of prehistoric times in the Riam Kanan River area, so that the area becomes a paleolithic cultural site (Fajari et al., 2018). So with the potential for paleolithic cultural sites in Riam Kanan, it can be used as a learning resource. This is the goal of this research, namely to design a technology-based learning model using the Petersphere media, so that this learning model acts as an answer to the problems of learning Indonesian history, especially in Indonesian prehistoric material, which will describe the process and stages of the learning model in the following discussion.

METHOD

This study uses a qualitative descriptive method, which describes the results of the study in the form of text from a literature study (Gerring, 2017). This research is divided into two kinds of research methods, the first is research on the historical material of paleolithic sites in South Kalimantan, and the second is research on the development of interactive learning models. In more detail, this research is divided into two steps, the first is an exploration of historical material for paleolithic sites in South Kalimantan, and the second is research on the development of interactive learning models. The exploratory step in this research is to analyze sources, both from the field and literacy studies (Abdurahman & Safa, 2007). The exploration stage of historical sources at the site enters the heuristic stage (Wasino & Endah Sri, 2018). Methods in Research and Development This research method is to produce a certain product, and test the effectiveness of the product. The stages used are the ADDIE model stages developed by Dick & Carey, consisting of Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009; Dick et al., 2005). In this study to the stage of analysis and design. The result is a learning model design based on the findings of the problem and also needs analysis. Needs analysis is carried out based on the curriculum needs of the learning model. so that in this study the design of an interactive learning model based on interactive maps and videophere media is presented. present the design of an interactive learning model based on interactive map media and videosphere to the design stage. more clearly we see Figure 1.

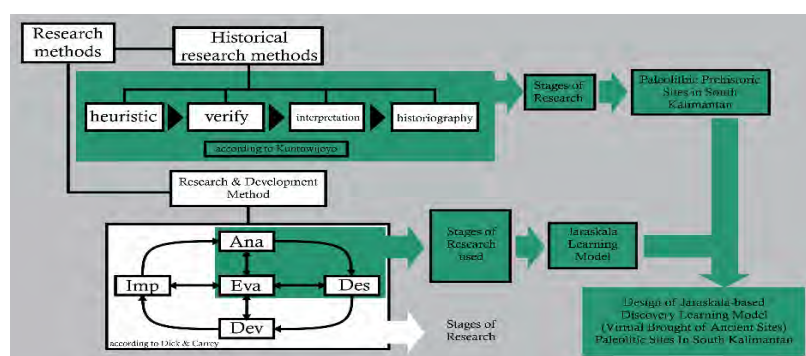


Figure 1
Steps for preparing the model design

FINDINGS

Data on Potential History of Prehistory in South Kalimantan

South Kalimantan is a province on the island of Borneo which is located at the southern tip. This province has a number of 13 districts and cities whose capital city is Banjarmasin City (BPS Kalsel, n.d.). There are many distribution sites in South Kalimantan, especially in the Meratus Mountains area, which is a mountain range that stretches from the northern end (Tabalong Regency) to the southern end (Tanah Laut Regency) of South Kalimantan Province. These mountains are dominated by limestone (karst) and have many caves (burrows). (Ansori, 2016). The karst landscape in South Kalimantan needs protection and preservation efforts, if the karst area is damaged then the resources and culture in it are also damaged and lost (Yulianda, n.d.). The karst area itself contains various natural caves and has important historical value, especially in prehistoric times (Subiyakto et al., 2020)

South Kalimantan has dozens of residential cave sites, which have high historical value, in addition to caves, also in the form of equipment workshops that are often used by early humans (Forestier, 2007). So that with the existence of high cultural heritage, it is necessary to have conservation efforts. The following is the distribution of prehistoric sites in South Kalimantan see figure 2 and table 1.

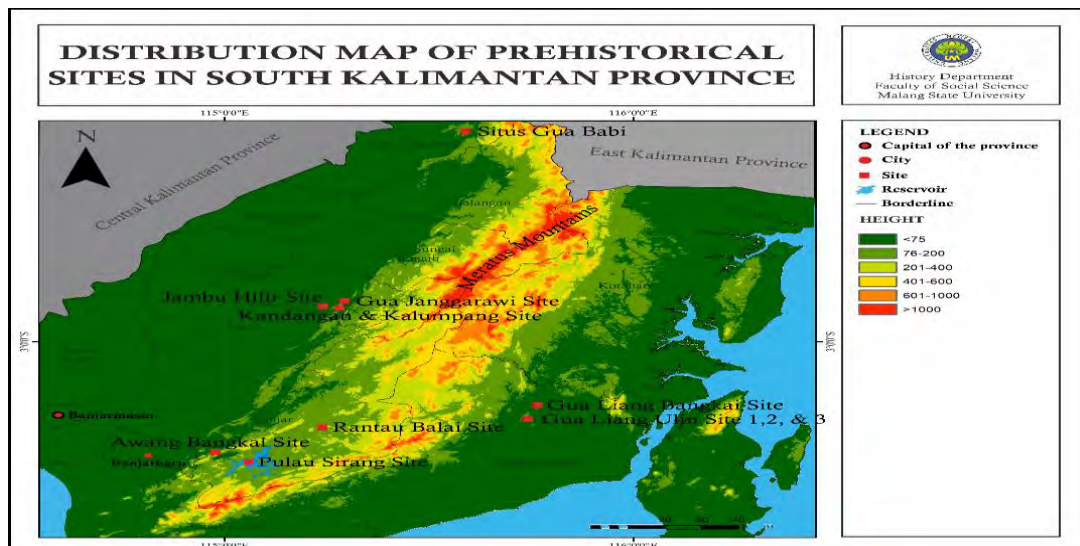


Figure 2
Map of the distribution of paleolithic sites in South Kalimantan

Table 1
Table of distribution of prehistoric sites in south kalimantan province

No.	Site Name	Potential
1	Sirang Island Site	Sirang Island itself is an island formed from the Riam Kanan reservoir, so as the reservoir recedes, the area of Sirang Island is increasing. There are various kinds of findings of prehistoric tools that are characterized by paleolithic technology, in the form of impact axes, penetrating axes, high-back flakes, perkutor, and waste debris from cutting tools (Cahyaningtyas & Oktrivia, n.d.). The geographical condition of Sirang Island which is difficult to reach and has the potential to sink due to rising water levels in the reservoir, by looking at the high potential, both in the form of artifacts and ecofacts, to maintain the existence of this Pulau Sirang site must be documented and visualized or digitized.
2	Awang Bangkal site	The Awang Bangkal site is the oldest prehistoric site in Kalimantan. There was a finding of a tool characterized by the paleolithic period, by Toer Soetarjo in 1958, the tool found was an ax ax made from a reddish-brown variant of jasper quartz. In 1975, several stone tools were found in the same location as before, namely tools made of quartz which are characterized by paleolithic technology (Fajari et al., 2018). In 2010 the Banjarmasin Archaeological Center team conducted archaeological research aimed at collecting the latest data on the types of rocks found in Awang Bangkal. The location of the Awang Bangkal site itself is difficult to identify because at that location there are sand and stone mining, so that the location around Awang Bangkal has drastically changed the earth's surface and coupled with the construction of a dam that stems the Riam Kanan River(Fajari et al., 2018).
3	Rantau Balai Site	Rantau Balai is located in the Riam Kanan area, precisely in the upper reaches of the Riam Kanan River, which was affected by the dam construction, so the Rantau Balai area shrinks when the reservoir water level rises. In 2012 stone tools were found that were characterized by paleolithic technology, the process of this discovery was by following the Riam Kanan River, Hajawa River, and Pao River (Fajari, 2017). The Hajawa and Pao rivers are tributaries of the Riam Kanan River. Locations where prehistoric artifacts can be found located on the banks of a river flanked by two cliffs, which are formed from igneous rock formations and conglomerate layers. Based on the environmental conditions and morphology in the area, tools with paleolithic technology have been found in the types of perimbas axes, hand ax hatching axes, and trimmed gravel,
4	Liang Ulin 2 Site	The Liang Ulin 2 site is a prehistoric cave site located in the southeastern karst area of the Meratus Mountains, this site is located in Mantewe District, Tanah Bumbu Regency, South Kalimantan. The burrow site consists of many separate locations that are still in one area. Based on its morphology, the karst cave, which is located in the Bukit Ulin cluster, Sukapeace Village, Mentawe District, has three terraced terraces. The three terraces of Liang Ulin 2 have archaeological potential, but the most archaeological data is found on terrace 3. 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. 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 (Fajari et al., 2018).
5	Gua Babi Site	This site is located in Tabalong Regency, precisely on Mount Batubuli, which holds archaeological potential for prehistoric times from 6000 years ago. Based on a report from the Kalimantan Archaeological Team of the Ministry of Education and Culture (2002), the Bukit Batubuli area was once inhabited by prehistoric humans from the Austromelanosoid race who developed preneolithic to paleometallic cultures in three caves, namely Pig Cave, Skull Cave and Cupu Cave.

Curriculum Analysis and Needs Analysis

Learning that is in accordance with the times is history learning that involves digital technology in the learning process, so that historical learning is in accordance with the times and the needs of students(Afwan et al., 2020). History learning that involves technology is history learning based on a combination of interactive maps and videosphere. Based on surveys that have been distributed by samples to students, teachers, and students that learning that is in accordance with the times is learning that involves technology (Maghfiroh & Suprpta, 2020; W. D. Sulistyo et al., 2021). So that later in

the application of this learning model, it will be integrated with technology, so that in this case it can be a trigger for the spirit of learning history and answering the challenges in it. The technology in question is Petersphere, which is expected to be the answer to challenges in learning, especially learning on prehistoric material.

The 2013 curriculum at the high school level and equivalent has demands to carry out learning with prehistoric material, namely the Basic Competence (KD) 3.2; 3.3; and 3.4 with detailed descriptions as follows: Basic Competence (KD) 3.2 which contains "understanding the pattern of people's lives in the pre-literate era" this is to find out the pattern of human life in the prehistoric era, ranging from religious, social, economic, and government.

1. Basic Competence (KD) 3.3 which contains "Analyzing the origins of the ancestors of the Indonesian nation (Proto, Deutero Melayu and Melanesoid)" in this KD to find out the origin of the ancestors, their entry route, to be associated with the tribes in the area. Indonesia currently has a connection with this, one of which is on the island of Kalimantan.

2. Basic Competence (KD) 3.4 which contains "Analyzing based on the typology of Indonesian Praaksara cultural products including those in the closest environment" in this KD to find out the abandoned cultures, ranging from technology results, residences, cave paintings, ways to survival, social systems, and religious outcomes, especially in paleolithic sites in the South Kalimantan region.

Seeing that there are 3 Basic Competencies (KD) which contain prehistoric material in Indonesian History (compulsory) Class X makes the need for the existence of these media very important in the learning process in the classroom. Prehistoric materials in Indonesia are classified as minimal sources when compared to other historical eras, this is because in prehistoric times they did not leave evidence in the form of writing, but left in the form of artifactual objects, ecofacts, fossils, and so on, so that prehistoric sources are the result of interpretation. critically obtained systematically from historians (Rofiq, 2016). The lack of information obtained by prehistoric researchers, so this has an impact on the abundance of prehistoric learning materials and resources in the classroom and the lack of knowledge of teachers and students in analyzing and researching relics, evidence, and these sources (Karyono, 2011). This is coupled with the problems faced when learning prehistoric material, which is considered to be very motivated in textbooks, this is because in prehistoric material it is difficult to carry out other learning models that do not use textbooks, so that the presentation of material information is in the form of verbal so that it is still abstract (Karyono, 2011).

So with this problem, with the design of the Jaraskala learning model, this is the answer. Prehistoric material is very difficult to present real artifactual objects in front of students, this is due to the minimal number of prehistoric artifacts whose existence is not circulating freely and is only limited to certain institutions and museums, thus requiring learning or study tours to these locations. Meanwhile, contextual learning in the field is also not possible, or this activity is called outdoor learning or study tours. If you look at the distribution of prehistoric sites in Indonesia, they have a position that is far apart and uneven in every city or region, and even for the site itself is located between islands, for example in South Kalimantan, Bengawan Solo, Situbondo, Flores, Sulawesi and other areas. So that to carry out study tours is also considered very less effective (Yudiantika et al., 2013). So that the presence of media and learning models developed can be an alternative in learning history on prehistoric material, namely by presenting virtually with Petersphere media, and packaged with the Jaraskala learning model, so that the quality of prehistoric learning can increase, as well as the experience gained by students or students. Learners approach the real as if the object of learning is in front of their eyes.

The selection of material in the form of a paleolithic site in the right cascade area is also based on the importance of the conservation efforts of the site, so that in this case it is one aspect that needs to be considered in the needs analysis, namely the need for efforts to preserve cultural heritage sites in the

area. There are paleolithic sites in South Kalimantan, which are less familiar in the educational environment, namely the Awang Bangkal site, Rantau Balai and Pulau Sirang, all three of which are located in the Riam Kanan Reservoir area. The three sites are being threatened due to the rising water level of the reservoir, which submerged the site, so that it could potentially change the pattern of the site and even eliminate the site, especially the Pulau Sirang site in the middle of the reservoir, before the island reservoir was a hill that turned into a hill. the island because its surroundings are filled with river water which is dammed into a reservoir (Fajari et al., 2018). There is a potential for drowning, there have been efforts to save artifacts, namely as many as 143 artifacts from prehistoric times that have been saved and become a collection of the Lambung Mangkurat State Museum which consists of various classifications of morphology and forms from various prehistoric sites in South Kalimantan (CAVE et al., n.d.). However, from an artifactual point of view, it can be moved and saved, but in the form of an ecofact it cannot be moved, so that it becomes a challenge in its preservation efforts..

Various exposures to the distribution of sites and site problems make learning technology in the form of Petersphere media and the Jaraskala model one of the efforts to preserve and perpetuate cultural heritage sites, so that generations can enjoy virtually, although limited but the essence of the learning is not reduced. The spread of sites that are far from each other, difficult terrain to reach, and also the threat to the sustainability of the site, it is necessary to digitize the site for the sake of preserving cultural heritage, especially for the world of education..

Learning Model Design

This learning model itself is a learning model that involves students and teachers, with the majority of activities carried out by students, as well as the stages, the teacher acts as a mentor and student facilitator. So basically this learning model uses a student centered learning (SCL) approach, where each individual student is free to explore without having to depend on the material presented by the teacher, so that learning resources come from learning media and teaching materials provided by the teacher. So that the active parties are students as recipients of information, so they are not only passive recipients in learning, so students have a big role in the stages of learning the student centered learning (SCL) approach. The SCL method is realized in the discovery learning learning model, which is a learning model that requires students to solve a problem by searching, identifying, observing, and discovering (Sari et al., 2019; Wargadinata et al., 2020). So in this case the teacher as a facilitator and director during the course of learning, the most important facility provided by the teacher is to provide virtual cruising media, namely Petersphere media (interactive maps and videosphere). The selection of this media itself is because, this media is practical, easy to make, easy to use, and easy to distribute to students.

The design of the discovery learning learning stage has 6 main stages, namely, stimulation, problem identification (problem statement/ identification), data collection (data collection), data processing (data processing), verification/verification, and conclusions. conclusion/ generalization) (Bernardini, 2002; Svinicki, 1998). Then in practice it is added with technology-based media, namely Petersphere, which presents virtual roaming, so this learning model is called the Jaraskala model, which is described in the following stage diagram see figure 3.

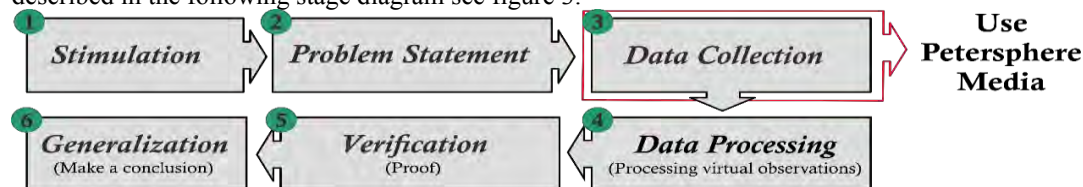


Figure 3
The design of the flow of the use of petersphere media

A more detailed description is divided into two parts, namely the student activity section which describes what students do, and the teacher activity which describes what the teacher does.

Activities at the beginning of learning are in accordance with general classes in the classroom, starting from greetings, praying, and other apperceptions. So that the core activity is the Jaraskala learning model, the duration of which is adjusted to the provisions of each teacher which ranges from 45-60 minutes, so that basically the entire series of stages of the Jaraskala learning model is carried out in one meeting. which then ends with the activity of drawing conclusions or reflection in a meeting led by the teacher.

The stages in this activity for students start from stimulation (stimulation) or opening to the material to be taught to students, after that enter the problem statement stage where students identify problems received from the teacher, which of course are in accordance with the learning objectives and achievements. namely prehistoric material in KD 3.2; 3.3; and 3.4, the problems raised will be in accordance with the material taught according to KD. This virtual learning model can be implemented on materials other than prehistory. Technology-based learning, especially visualization technology that presents teaching materials in the classroom, has a high level of flexibility, and can be taught in sharing basic competencies in Indonesian History subjects (Fonna, 2019). So with this technology the learning process is more effective and quality. After that, it was continued with data collection, which at this stage used the Petersphere media, which was facilitated directly by the teacher. Then proceed to the generalization or conclusion process with detailed stages called the syntax as follows see figure 4.

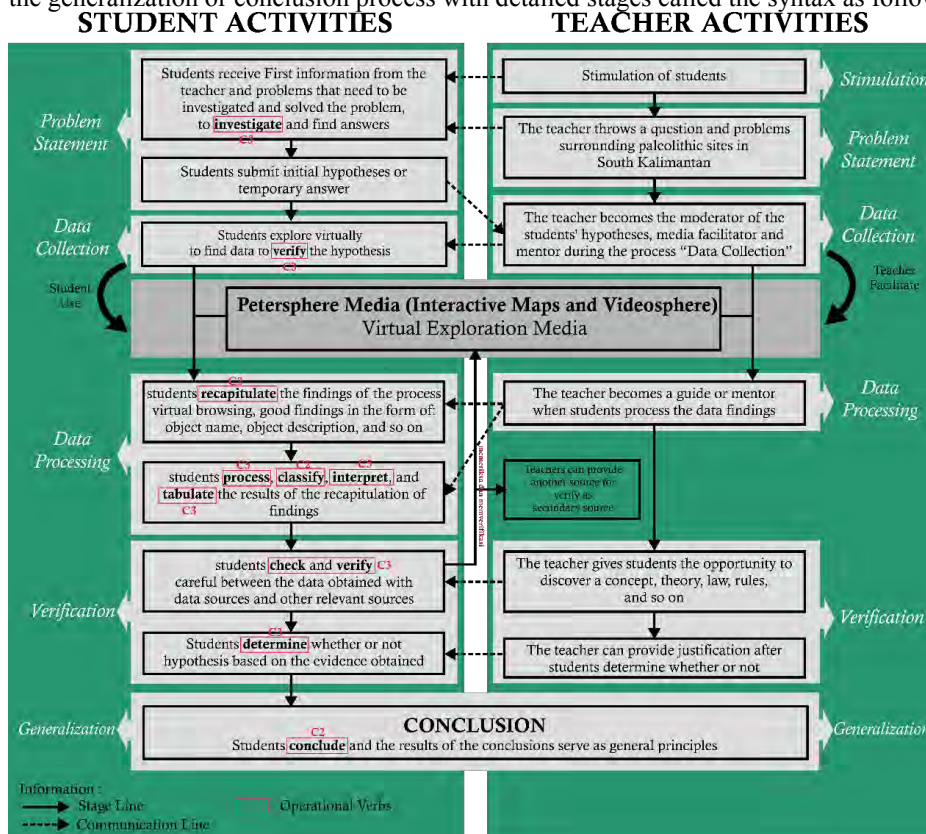


Figure 4
Teacher and Student learning activities

The Jaraskalan learning model itself uses the SCL (students centered learning) approach so that the role of students is greater than the teacher, in the syntax diagram of the Jaraskala learning model in the student activity section, students are required to think critically and creatively, so that at the stages of student activity there are operational verbs (OV) classified based on Bloom's taxonomy. Bloom's Taxonomy is a hierarchical system that classifies levels of thinking and skills from lowest to highest (Armstrong, 2016; Seaman, 2011). Each stage has an operational verb classified from C1 to the highest in C5. There is C2 (understanding) which is understanding something, reinterpreting it in your own words (Forehand, 2010), such as activities to conclude the results of virtual roaming. C3 (application/application) is the ability to apply concepts in practice in new situations, for example, re-examine, determine, investigate, so that this classification can be seen when students use media and explore virtually. C5 (evaluate) if you look at the stages of the learning model, C5 is the ability to make an assessment by making hypotheses from the results of the interpretation (Utari, Madya & Pusklat, 2011). Seeing from the presence of operational verbs in a discovery learning learning model based on virtual roaming or Jaraskala, the purpose of learning is increasingly visible, namely a learning model that can improve students' critical thinking in solving a problem by conducting searches and discoveries.

CONCLUSION

The world of education cannot be separated from technology, especially technology that supports learning. There are various problems in learning which can then be solved by the existence of learning technology, and these problems are found in the subjects of Indonesian History subjects in the prehistoric period of Indonesia, the lack of sources and teaching aids is one of the reasons for the development of the Jaraskala-based discovery learning model. The prehistoric period of Indonesia has its own level of difficulty, this is due to the absence of written sources in that era, thus requiring a systematic critical analysis. Then on the other hand, cultural sites in prehistoric southern Kalimantan are very rich, especially in Banjar Regency, Tabalong Regency, and Tanah Bumbu Regency. The majority of these prehistoric sites are located in the Meratus Mountain range which requires conservation efforts, namely through the world of education, which is packaged using educational technology (digitization) so that the sustainability of these sites can be immortalized both materially and non-materially (knowledge). The discovery learning model based on Jaraskala is learning that is the answer to various problems and needs. The learning models are packaged with a student centered learning (SCL) approach so that in the learning process students have a large portion in learning when compared to teachers, because the teacher is only a learning facilitator. The discovery learning model based on Jaraskala is divided into 6 stages, with the third stage being data collection using the media provided by the teacher, namely Petersphere media. This petersphere media acts to present material, which will be used by students as a virtual exploration and exploration media, so that exploration activities do not require more energy, time, and cost, and can be done in the classroom indoors. The stages in the discovery learning model based on Jaraskala are adapted to the needs of the curriculum, the material of this learning model refers to basic competencies 3.2; 3.3; and 3.4 Indonesian History subject for class X, which contains material about prehistory. So that by adjusting to the curriculum, learning takes place more directed and contextualized. Activities in these stages are also adjusted to the level of students' thinking, which is classified based on Bloom's Taxonomy, namely by using operational verbs. So that student activities are adjusted to the level of student thinking. So in this case the learning model in measuring students' thinking levels in terms of cognitive (knowledge) systematically and effectively. Hopefully the results of this research can be a reference for new knowledge about historical learning innovations.

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