

Study of Physics Concepts in Cave Exploration Activities to Develop Physics Edupark Digital Book for Senior High School Students

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Abstract: Even though the concept of physics is very important in daily activities, the cave exploration activities (caver and or cave tourists) are not based on of physics concepts. In addition, the teachers do not realize that through caves and it exploration activities can be used to learn the physics concepts. This research aims to study the physics concepts in caving activities where it used to develop of physics edupark digital books for senior high school students. This is preliminary research that part of research and development method by using the Plomp model where the study consists of teacher, student, and material potential analysis. This study has been resulting that many concepts while cave exploration activities. It can be used to lean the physics concepts then developing an Edupark physics digital enrichment book as a demand of the Merdeka's Curriculum. The learning activities growth from the abilities of students who emphasize contextual learning where the students building meaningful understanding through learning and optimizing technology in learning.

Keywords: Cave Exploration Activities; Contextual learning; Digital enrichment book; Merdeka's Curriculum; Physics Edupark.

Introduction

The dynamics of modern world life is developing very fast which raises various variants of quite serious challenges for all circles. The development of the global world in the 4.0 era has an impact on all aspects of human life, without exception in the field of education in Indonesia. The development of science and technology is so rapid, that there is no more space for us to communicate with each other. The development of science and technology has an impact on the challenges and global competition faced by every country. Including in the field of education. Therefore, it is necessary to create quality human resources to be able to compete with the wider community in Indonesia. In the

21st century, students must have the ability to master and skillfully combine knowledge, attitudes, skills, and technological proficiency (Husniyah & Ramli, 2023). High-quality education ensures the development of quality human resources. In contemporary society, there is a significant emphasis on education as it plays a crucial role in equipping individuals with the necessary skills to thrive in the ever-evolving digitalized world (Solas & Sutton, 2018).

As the backbone of every society, education is very influential in various parts of a country's politics, economy and welfare (Bigagli, 2019; Etherington, 2019; Suresh & Kumaravelu, 2017). Indonesia has various potential resources. in it there are various types of rocks, minerals, and solid, liquid and gas energy sources, as

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well as various forms of various soil structures such as mountains, hills, valleys, and karst or underground caves (Pratomo, 2006).

Karst is a terrain with a distinctive shape of the earth's surface and flow patterns formed in limestone due to water dissolving (Kasri, 1999). Almost all limestone areas in Indonesia are scientifically landscaped karst which should become a national protected area as mandated by Law 26/2007 and PP 26/2008. However, behind its abundant wealth, karst areas are non-renewable resources and are vulnerable to environmental influences. Caves are part of the karst area that can be used as a tourist attraction.

Caves are karst morphological characteristics which are the result of dissolution of the karstification process (Jennings, 1985). A cave is any underground opening whether light or dark, broad or narrow, that is formed through a system of fissures, fissures or River flow which sometimes form an underground river flow (Ko, 1986). Cave exploration activities are a form of exploiting tourism potential in local karst areas that must be accompanied by a good understanding of caves in the community. In order to maintain natural ecosystem caves so that we have a long life, we must instill a code of ethics when exploring caves from an early age, one of which is through the field of education.

The presence of the Covid-19 pandemic has an impact on learning and creates various obstacles such as: lack of availability of infrastructure, learning methods that are not suitable for the needs of students, minimal family support, decreased motivation to learn causing students to experience stress, boredom and laziness of students who are increasingly declining (Batubara & Batubara, 2020). This is what causes learning loss in current learning which can be seen from the decrease in the achievement of students' literacy and numeracy competencies (Jatira & S, 2021). Literacy skills are one of the crucial factors for individual success (Yulia et al., 2018). Learning loss can have an unfavorable impact on Indonesia's future economic growth. This is because the nation's generation has decreased learning abilities, impaired emotional and psychological development, a range of dropouts, and has the potential to find it difficult to get a decent job due to reduced competence (Rengkuan et al., 2022). So, if learning loss is not handled immediately it will result in a mass academic decline (Hanafiah et al., 2022).

In order to minimize the impact of learning loss, efforts that can be made include the following: 1) Involve students in preparing accelerated learning programs as an effort to overcome crises related to learning loss and strengthen learning trends, 2) Simplify the planned curriculum to accelerate learning by focus on key skills and essential content, 3. Tailor learning to student learning levels, and 4. Consider digital technologies to facilitate more individualized teaching practices

(Molato-gayares et al., 2022; OECD, 2021). The Indonesian government established an the Merdeka's Curriculum as a step in restored learning due to learning loss. The the Merdeka's Curriculum emphasizes learning that is designed to suit students' abilities, interests, and learning profiles or commonly called differentiated learning.

One important component in the learning process is enrichment materials. In the the Merdeka's Curriculum the use of enrichment materials includes the form of implementing this differentiation learning, namely through content differentiation. Enrichment materials are given to students who are already in the very proficient category (guidelines). This shows that the enrichment program is an important component in implementing the the Merdeka's Curriculum. In addition, the management assessment in the the Merdeka's Curriculum is obtained by comparing the achievement of student learning outcomes with the criteria for achieving learning objectives. In determining the achievement, several approaches are used, including using a rubric that can identify the extent to which students achieve learning objectives. For students with very good categories, they follow further learning and are given enrichment.

Program Enrichment can be interpreted: providing expansion of experiences or activities identified by students beyond the learning mastery determined by the curriculum. By taking into account the principles of individual differences (initial abilities, intelligence, personality, talents, potential, interests, learning motivation, learning styles), enrichment programs are carried out to meet the rights of children (Monika et al., 2018). One type of enrichment program involves engaging students in exploratory activities that are still relevant to the presented material. These activities can include exploring historical events, reading books, inviting guest speakers, making discoveries, conducting experiments, and other experiences that go beyond the regular curriculum. Enrichment books are the best tool in developing students' literacy (Sloan, 2003). The use of enrichment books in learning benefits students because lessons feel more alive (Ciecierski & Bintz, 2015). Enrichment books are books that contain richer material and are commonly used as companions or complements to the main textbooks (Permendiknas RI No. 2, 2008: 2). Enrichment books are not only for students but can also be used by other parties or society in general (Depdiknas, 2005).

Making books as a source of learning is not only limited to books in printed form, but also Books are available in digital form known as electronic books or electronic books (Simanjuntak et al., 2019). E-books are learning media consisting of text, images, or uses that are useful for conveying messages or information via a computer or smartphone so that physics learning is

more easily accessible to students (Sadraini & Rifai, 2020). Electronic books in learning also include the use of globalization progress towards a more positive direction (Anwar et al., 2021). The use of e-books in learning physics can increase motivation to learn physics (Ayu & Fauzi, 2020; Pardede & Sitorus, 2021; Rahmasari et al., 2022). Another advantage of electronic books is that they reduce the use of paper making them a more friendly environment, efficient, cheaper, and unnecessary a large place or space.

Physics is a scientific discipline that examines natural events related to matter, humans, and their interactions with other materials (Novitasari et al., 2017). Many students still think that physics is just theory and have a limited understanding of phenomena and the application of physics in everyday life, even though physics lectures teach phenomena that exist in everyday life. (Damayanti et al, 2022). In fact, learning physics does not only study facts, laws, principles, and theories, but also experiences how these facts and principles are obtained. Learning is not teacher-centered, but focuses on how to make students actively construct their own knowledge, discover and develop their own facts and concepts (Derlina, 2016). This includes the factor cause of the emergence of the view that physics is a boring lesson. Due to the delivery of materials that tend to be boring and associated with memorizing formulas and solving numerical problems (Derlina & Sitepu, 2018). Utilizing edupark through natural and man-made tourist objects as learning resources can change the view that physics is a boring and difficult subject, whereas on the contrary physics learning can take place in a fun context (Lestari & Rifai, 2021). Edupark is a tourist destination that can be used as an educational park to observe the application of learning concepts so that edupark can be interpreted as a park used as a learning facility (Sadraini & Rifai, 2021). By making edupark a learning resource it will make students happy in learning (Joseph, 1969). This edupark based learning is also part of the implementation of Permendiknas No. 22 of 2006 that the utilization of regional potential can be done by optimizing the surrounding environment, including tourist objects as a source of learning. The development of integrated e-books in tourist attractions or what is called e-book edupark is in line with the regulation of the minister of education and culture 10 number 3 of 2014 which states that learning must be challenging and fun, context-based (the natural surroundings as a source of learning) and present oriented (Lestari & Rifai, 2021). This edupark aligns with the requirements of The Merdeka's Curriculum, which emphasizes contextual learning and the construction of meaningful understanding.

West Sumatra with its natural and cultural wealth can be used as a tourist and educational destination. Several studies related to physics edupark in West

Sumatra include the tourist destinations Mifan Waterpark Padang Panjang (Sari, Rifai, & Emafri, 2020), Geopark Harau Lima Puluh Kota (Yulia & Rifai, 2019), Semurup Kerinci Hot Springs (Wulandari, Hamdi, Akmam, & Dewi, 2021), Padang Beach (Elvisa & Rifai, 2021), Rumah Gadang (Sadraini & Rifai, 2021), Geopark Ranah Minang Sikolek (Ummah & Rifai, 2021), Anai Land (Delvi & Rifai, 2020), Bukik Chinangkiek Park (Lestari & Rifai, 2021), Tabek Patah (A. P. Sari & Rifai, 2021), Padang Ganting Hot Spring (Sufetri & Rifai, 2020). Based on some of the edupark research, there has been no research that raises caves as a means of physics edupark.

While the potential for cave tourism in West Sumatra is enormous, especially in the Sijunjung area which is part of the Ombilin basin area which is at on track volcano Bukit Barisan plutonic and active Sumatra Fault System Zone so that it has quite varied karst appearance (Nofirman, 2016). However, residents around the karst area honored have income sector only primary and have not functionally exploited the potential of the cave as a tourist attraction. Therefore, it is necessary to have an approach regarding the potential utilization of caves as a tourist attraction that is in accordance with the community environment. This approach pays attention to aspects of safety, natural preservation, and follows applicable regulations to avoid negative impacts on the environment and surrounding communities. One form of approach that is suitable is through the Edupark Digital Enrichment Book on Physics Concepts in Loguang Cave Tourism in Muaro Sijunjung District.

Method

The type of research used in this research is using the Research and Development method with the development model used being adapted from the Plomp Model. The Plomp model is used because it fits the characteristics found in the field. The Plomp model consists of three stages: 1) preliminary research, 2) prototyping stage, and 3) evaluation stage. This Plomp model has several advantages. First, this model is more appropriate for use for research purposes that produce products in the form of learning tools, models, and learning media. Second, the description of each step in this model is complete and systematic. Third, there are individual and small group evaluations. Fourth, there is an emphasis on preliminary research activities carried out at an early stage as a basis for formulating problems and finding appropriate solutions (Plomp, 2013). Of the three phases of the development of the Plomp model, this study only used the initial research phase. This consists of teacher analysis, student analysis, and material potential analysis.

In the teacher's analysis, the data used is obtained through observed implementation of the the Merdeka's Curriculum in schools as well as related interviews and questionnaires and usage of digital enrichment books in schools. Teacher analysis was carried out on physics teachers at Government Senior High School (SMA Negeri) 2 Sijunjung which is a school located in a cave tourism area.

Furthermore, student analysis was carried out to see the need for digital enrichment books and knowledge about caves which was carried out in class X MIPA 3 at SMA Negeri 2 Sijunjung. Student knowledge questionnaires related to cave exploration activities were prepared following the Cave Tourism Indonesian National Competency Standard (SKKNI) with indicators explained in Table 1.

Table 1. Instrument knowledge of students related to cave exploration indicator

Indicator	Sub Indicator
Collect data and information about cave tourism objects	Knowing the purpose of doing cave tourism activities Collect data and information about cave tourism objects
Prepare a digital enrichment guide book on data and information about cave tourism objects	Prepare a book of rules/regulations and a cave search guide
Prepare for cave search needs	Prepare standard cave search equipment Prepare standard Emergency First Aid Equipment (PPGD).
Prepare yourself to do a cave search	Check physical and psychological conditions before carrying out cave exploration activities Know what is allowed and prohibited when searching caves The ability to interpret the potential of the cave according to the conditions of the cave field

Then an analysis of prior knowledge of physics concepts was also carried out and identification of student learning styles was carried out on 127 class XI students who were members of SMA Negeri 2 Sijunjung, SMA Negeri 1 Lareh Sago Halaban, SMA Negeri 2 Padang Panjang, and SMA Negeri 1 Bukit Sundi. As for learning styles, data analysis techniques were carried out. Identification of student learning styles was carried out based on a modified method from the Learning Style Inventory developed by (Kolb, 1984). Learning styles serve two purposes: an educational tool to increase individual understanding of the learning process from experience and their unique individual learning approaches and investigate experiential learning theory and characteristics of individual learning styles (Joy & Kolb, 2009). Student's initial knowledge of Physics was identified through a multiple choice test consisting of 15 questions about physics concepts developed from the Force Concept Inventory and the Converging Lenses Concept Inventory (Wörner et al., 2022).

Finally, in the analysis of material potential, it is carried out by direct observation to find out the main concepts of physics that will be discussed in digital enrichment books and detailing concepts that are relevant to cave tourism activities. This material potential analysis activity consists of identifying and carrying out possible descriptions of the physics edupark potential that supports learning materials in cave tourism activities.

The measurement scale that will be used in this study to determine the score of the respondents' answers is to use the Guttman Scale. According to (Sugiyono, 2014) the Guttman scale is a scale used to obtain firm answers from respondents, that is, there are only two

intervals with answers made with the highest score (agree) one and the lowest (disagree) zero. The data analysis technique uses quantitative descriptive statistical analysis by calculating the percentage of the number of respondents' scores based on the assessment of each answer using equation 1 (Riduwan, 2010).

$$P = \frac{f}{n} \times 100\% \tag{1}$$

Information:

P = Final grade

f = Score obtained

n = Maximum score

The percentage of quantitative data obtained is then categorized according to Table 2.

Table 2. Percentage of category division prior knowledge students about physics concept

Percentage (%)	Category
$n \leq 62.22$	Low
$62.22 < n < 72.01$	Medium
$n \geq 72.01$	High

(Wijaya et al., 2023)

Information:

n = Percentage of prior knowledge students

For data on student knowledge about cave exploration activities, the percentage of quantitative data obtained is then categorized according to Table 3.

Table 3. Percentage of category division prior knowledge students about cave exploration activities

Percentage (%)	Category
0-25	Less
26-50	Very less
51-75	Good
76-100	Very good

(Riduwan, 2009)

Result and Discussion

Teacher analysis was carried out using instrument in the form of questionnaires and interviews that were given to class X teachers of SMAN 2 Sijunjung which were conducted at the beginning of the semester of the 2022/2023 academic year. From the interview process conducted, information was obtained that SMAN 2 Sijunjung implemented the Independent type curriculum. Then information was also obtained that digital enrichment books had never been made to be used during the learning process and the constraints experienced by the teacher were in making learning resources that matched the characteristics of students. It is necessary to develop a digital enrichment book based on local tourist objects. It is hoped that the content of the book can be more applicable in life so that the material can be more easily understood.

Based on the results of the questionnaire given, it can be seen that the merdeka's curriculum at SMAN 2 Sijunjung is already in the sufficient category with percentage of 65.21%. As for some points that have not been implemented optimally including designing learning according to the level of achievement of students, motivating students, creating independent learning for students, and implementing learning that involves students in finding solutions to problems everyday appropriate to the learning stage. Based on the results of the questionnaire and interviews conducted, it was obtained that the solution that the researchers offered was through a digital enrichment book about studying physics concepts in cave tourism. This is because through enrichment books can support the creation of learning according to the level of achievement of students. Enrichment books packaged in digital or electronic form can motivate students during the learning process (Yunita & Hamdi, 2019). The designed enrichment book also refers to the identification results of the Kolb learning style model which divides the types of learning styles based on the learning stage (Joy & Kolb, 2009).

Students were analyzed related to digital enrichment books, students' knowledge of caves, knowledge of physics concepts, and students' learning styles. The study focuses on analyzing the utilization of digital enrichment books and the level of knowledge about caves among the students of Class X at SMAN 2

Sijunjung. The results of the analysis show that the use of digital books in physics learning is in the sufficient category with a percentage of 57%. Then referring to the results of the knowledge analysis of cave exploration activities, it can be seen that students are interested in cave exploration activities, this is illustrated in the diagram in Figure 1.

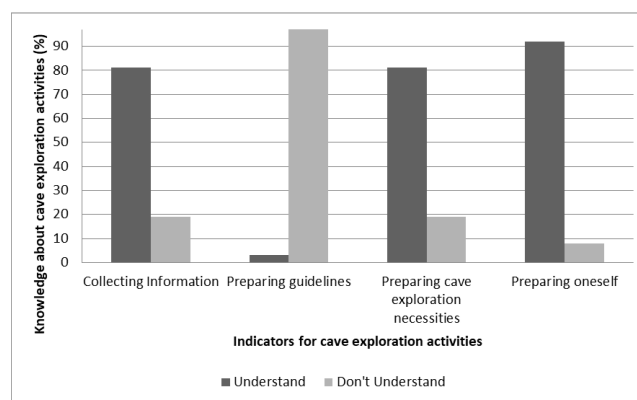


Figure 1. Diagram of student knowledge about cave exploration activities

As many as 92% of students understood that before carrying out cave exploration activities, they had to prepare a guide as well as prepare themselves before searching. However, students still less information regarding cave exploration as shown in the results of the analysis that 19% of students do not understand information about caves and needs when exploring caves. So, the designed edupark digital enrichment book will later bring the concept of physics to review information about caves and the needs that need to be prepared during cave exploration activities. Learning about the ins and outs and use of the environment turns out those students are not only invited to learn concepts about the environment, but the environment can also be a source of learning (Muhlis & Ali, 2020). Learning using the environment allows students to find meaningful relationships between abstract ideas and practical application in real world contexts, concepts are understood through a process of discovery, empowerment and connection (Depdiknas, 2008). The study of the concept of physics during the cave exploration was in accordance with the results of the interview, namely that it was hoped that the edupark digital enrichment book would be developed more application in life so that the material is easier to understand.

Besides being able to enjoy the beauty of the ornaments, the karstification process in the cave also helps reduce the impact of global warming. CO2 absorption in the karstification process can help reduce the impact of global warming due to CO2 concentrations excess. Therefore, it is important to understand information about caves and cave exploration activities

as an effort to preserve caves as well as maintain personal safety during cave exploration activities. Students as agents of change need to be given education related to cave tourism objects so they can participate in preserving and developing sustainable (Febriyantiningrum et al., 2018).

Furthermore, a test was also carried out on students' prior knowledge of physics concepts. The initial knowledge test of physics concepts was carried out in 4 schools in West Sumatra. The results of the test show that students' initial knowledge of physics concepts is still in the very low category. So, the need for learning resources that can help in increasing students' knowledge of physics concepts. Of the various types of learning resources, enrichment books are the right solution for students to understand the correct physics concepts (Wahyudi et al., 2018).

Enrichment books are books that can enrich and improve mastery of science and technology, skills, and shape the personality of students, educators, education managers, and other communities (Depdiknas, 2005). One of the obstacles in learning is still minimal readiness supporting books that are in accordance with the demands of the applicable curriculum (Pertwi et al., 2016). Therefore, there is a need for enrichment books that can help students to deepen the concept and in accordance with the demands of the applicable curriculum. Analysis results that Students initial knowledge of physics concepts is presented in Figure 2.

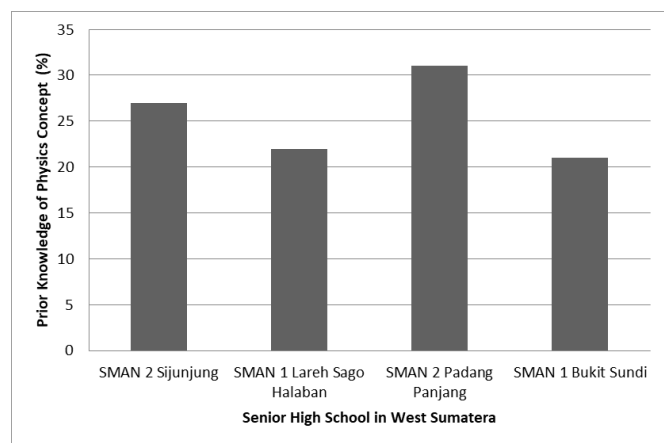


Figure 2. Diagram of Students' Prior Knowledge of Physics Concepts

The creation of differentiated learning in the learning process is a demand for the current the Merdeka's Curriculum. With differentiated learning the learning process must be able to accommodate the different academic needs of students by considering the learning profile. Learning style is one of the learning profiles that have an influence on the student learning process. Kolb learning styles can support differentiated learning because each Kolb learning style has a tendency to process and understand new information differently.

This model includes four different stages of learning: observation and reflection (observation and reflection), conceptualist thinking (concrete conceptualization), testing and experiencing (testing and experiencing), and reflective thinking (abstract conceptualization). Kolb's learning style involves a combination of two main dimensions: information processing and experiential learning. There are four Kolb learning styles, namely: convergent, divergent, assimilator, accommodation. The results of identifying student learning styles show data as shown in Figure 3.

The type of learning stage at SMAN 2 Sijunjung is dominated by the assimilative type. This type prefers to process abstract and theoretical information, and use inductive reasoning to solve problems. This learning style tends to focus more on understanding information than applying it to practical situations. An effective learning method for this style is through the use of structured books. These books can aid students in understanding concepts by providing explanations and presenting specific facts that contribute to a clearer understanding of the concepts.

Based on the data depicted in Figure 3, it is illustrated that almost the majority of class X students at SMAN 2 Sijunjung have a reflective observation learning type. Individuals with this learning style prefer to observe the situation around them, evaluate information and explore concepts in more depth. Individuals with this learning style tend to learn information through observation, reflection, and analysis of their surroundings. This type of learning style is compatible with edupark learning. So that it can help individuals with a reflective observation learning style to connect concepts or ideas by looking at situations in the surrounding environment that help them understand a concept. This type of learning style is compatible with edupark learning, including the enrichment book for Loguang Cave. By engaging in edupark activities, individuals with a reflective observation learning style can connect concepts or ideas by observing and analyzing situations in the surrounding environment, which facilitates their understanding of a particular concept.

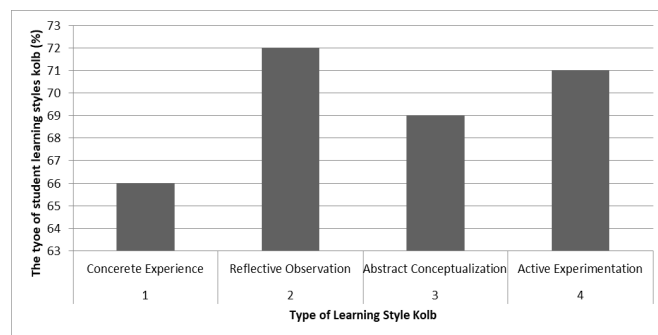


Figure 3. Types of student learning styles Kolb

Loguang Cave is a tourist attraction that can be used as a physics edupark facility for students at SMAN2 Sijunjung. Edupark physics learning through digital enrichment books can help students with the type of assimilation learning stage and reflective observation learning style to understand the concept of physics in activities tourism caves. The following is a map of the location of the Loguang Cave as shown in Figure 4.

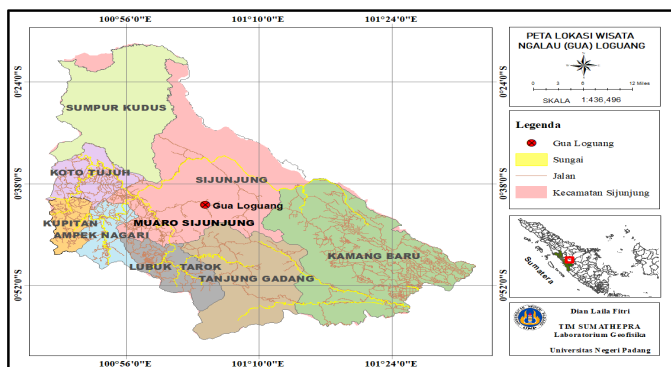


Figure 4. Location map of the Loguang Cave

Loguang Cave is the largest canyon in Sijunjung. The cave showcases a breathtaking view of magnificent stalactites and stalagmites that adorn its interior. This captivating tourist attraction is located in the Air Angek area and has become a captivating destination for visitors. Cave mouth log horizontally shaped. Before entering, we must ascend through a series of rocks and climb some stairs. The following is the appearance of the main door of the cave as shown in Figure 5.



Figure 5. The main entrance of Loguang Cave

Loguang Cave, which is located in Nagari Aie Angek, Sijunjung District, Sijunjung Regency, has a hole that is horizontal and slightly damp. This cave has beautiful ornaments such as Flowstone, Stalactites and

Stalagmites and colored guano chocolate old. Inside there are living things dominated by bats. The position of this cave is about 14 KM from the center of Sijunjung District and only about 20 KM from the center of the Regency city, namely Muaro Sijunjung. This location can be reached by using a four-wheeled vehicle while enjoying the expanse of hills and forest still beautiful, as well as views of rice fields that stretch beautifully. The area around the loguang cave tour is also equipped with various facilities including a large parking area and is often used as a place for camping. Around this location there are also toilets and baths or a creek that comes from the canyon.

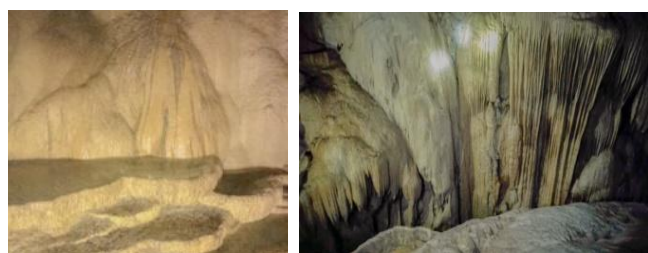


Figure 6. Several facilities in the area around the Loguang cave (a) Parking location, (b) Swimming pool

In addition, this cave is a class 1 karst type because it has an underground river that functions as a permanent underground water storage and speleothem still active and still inhabited by typical fauna, namely swallows, although in small quantities. The value of the importance of karst water sources for meeting the water needs of the surrounding community is a strong basis for efforts to conserve karst areas and their caves (Oktariadi, 2015).

Along with the development of the times, humans use natural resources on a large scale, without regard to their management and preservation for the foreseeable future. Educational programs can be a bridge in the implementation of environmental preservation. Formal education plays a crucial role in shaping students' personalities, attitudes, and behavior, including their approach to environmental preservation in the vicinity of the cave.

The main activity in cave tourism is exploring the caves. Cavers can enter the cave and explore inside to see karst rock formations, stalactites, stalagmites and other speleothem. One interesting feature of the Loguang Cave its impressive speleothem called the giant flowstone, commonly referred to as the "bridal curtain" by the local community. Several ornaments in loguang cave are presented in Figure 7



(a) (b)
Figure 7. Several ornaments in Loguang Cave
 (a) Rimstone pool, (b) Flowstone

To explore the cave, tourists are usually required to use safety equipment. Cave exploring activities are usually carried out by tourists who are looking for an adventurous experience and want to explore the uniqueness of nature that is rarely found elsewhere. Exploring the cave also involves keeping the cave clean and adhering to environmental protection regulations, such as not destroying or taking natural ornaments in the cave.

This canyon has a difficulty level with a difficult category because the search field is quite slippery and challenging. With views inside the cave which is cool, spacious and equipped with beautiful flowstones, this Loguang Cave still has great potential to be used as an educational tourist attraction (edupark) as long as tourists follow the rules that apply. Complying with cave exploration regulations is very important to maintain the safety of tourists and the cave environment.

Therefore, the need for a digital edupark enrichment book on the concept of physics in this cave as a solution alternative become a means to assist students in providing education related to cave tourism as well as a guide to explore it which is studied based on the concept of physics. With the edupark digital enrichment book, it is hoped that it can help maintain and preserve the cave. The physics concepts that can be studied during the cave exploration process are shown in Table 4.

Table 4. The concept of physics in cave exploration activities

Aspects of Cave Tourism	Caving component	Physics Material
Swimming pool	<ul style="list-style-type: none"> • Pool water • Swimming concept • Pool floor • Slide 	<ul style="list-style-type: none"> • Fluid • Newton's laws • Momentum
Cave ornament	Hydrology cave Stalactites & Stalagmites	Energy Fluid: Capillarity in the process of stalactite formations stalagmites Surface Tension in water droplets
Standard equipment	caving Water drops at the end of a stalactite Lighting equipment (headlamp/flashlight)	a. Light waves: <ul style="list-style-type: none"> • Light propagation • Light reflection • Refraction of light b. Optical tool: Kind of lens on the headlamp c. Electromagnetic Waves in the color emitted by the headlamp Impulses
Caving ethics	Helm Shoes with large serrated soles Shirt covers all Such Compass Do not throw garbage in/around the cave environment It is forbidden to vandalize the cave ornaments Do not damage or take ornament cave It is forbidden to take guano Smoking is prohibited in the cave Bumped	The coefficient of friction on the shape of the sole of the shoe Temperature and humidity the air in the cave Inclined plane on the surface of the cave floor Magnetism Environmental pollution: The effect of plastic (polymer) waste on the cave environment Environmental pollution: Effect of chemical substances from paint pylox on the hardening process of minerals in cave ornaments Environmental pollution: Damage to the cave's ornamental structures Climate change: Disruption of guano's track record as a proxy for climate change Thermodynamics: The dangers of cigarette smoke gas radiation a. Pressure:

Aspects of Cave Tourism	Caving component	Physics Material
The Dangers of Caving	Slip	The effect of the surface area of the stalagmites on the amount of force received by the skin
	Lost	b. Newton's 3rd law on impact Frictional forces on the surface of the cave floor Sound waves: Effect of sound reflection on the uneven surface of the cave walls on sound intensity in the cave
	Gas poisoning	Gas kinetic theory: The effect of the volume of gas produced by guano on the temperature in the cave
	Sink	a. Fluid: Water discharge b. Light waves: Refraction of pool water in a cave
	Chills (Hypothermia)	Effect of air temperature in the cave on the body

Based on Table 4 it can be seen that many cave exploration activities can be associated with physics concepts. This provides students with the understanding that various natural phenomena in their surroundings are linked to principles of physics. Based on the results of observation and analysis of the potential material, it can be concluded that cave tourism activities can be used as a physical edupark and as an object for the development of edupark physics digital enrichment books.

Conclusion

Based on the preliminary research data that has been done, it can be concluded that the enrichment program is an important part of meeting the demands of the Merdeka's Curriculum. The edupark digital enrichment book is suitable for implementing differentiated learning by paying attention to student learning styles. Students in class X SMAN 2 Sijunjung have an assimilation learning stage and a reflective observation learning style. Caving activities can be used as a physics edupark and object in the development of digital enrichment books because many physics concepts are related to these activities. Therefore, it is necessary to have an approach regarding the potential utilization of caves as a tourist attraction that is in accordance with the community environment. One suitable approach is through the use of the Edupark Digital Enrichment Book focusing on Physics Concepts in Loguang Cave Tourism in Muaro Sijunjung District. These digital enrichment books can assist students in acquiring information and developing their inductive reasoning skills by observing the surrounding environment.

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Author Contributions

Pratiwi Ineke Anwar; conceptualization, data curation, formal analysis, methodology, writing-original draft, Hamdi Rifai; supervision, Ferdinal; conceptualization, methodology, validation, project administration, Siti Zulaikah; conceptualization, validation, project administration, Husna; conceptualization, writing review & editing, Tessa Destia Putri Lisa; data curation, investigation, and writing review & editing, Dini Fitriani; conceptualization and validation.

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Conflicts of Interest

The authors declare no conflict of interest.

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