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Analysis of The Initial Needs of Students of SMAN 1 Lareh Sago Halaban as The Basis for The Development of Edupark Jam Gadang Enrichment Books

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ABSTRACT

Edupark is a learning resource that utilizes tourist attractions, derived from a combination of the words educational (education) and park (park). This concept functions as a place to play, exercise, relax, and interact socially. This research aims to find learning resources with the EDUPARK approach, limited to the EDU stage. Data were obtained through interviews with physics teachers and 56 students of SMAN 1 Lareh Sago Halaban. The results of the Edupark Finding stage showed that Jam Gadang has potential as a learning resource. Direct observation found many relevant physics concepts. Needs analysis showed that teachers have not developed edupark-based teaching materials, while students need enrichment books that link physics with real life. Therefore, the development of edupark-based enrichment books is expected to support the Merdeka Curriculum and increase interest in learning physics. how many words is this.

Keywords: edupark, enrichment book, concept fitting technique.

I. INTRODUCTION

Education has an important role in improving the quality of human resources to inherit, develop and build an advanced national civilization in the future. Quality education is education that is able to provide meaningful learning for students [1]. The government has taken various steps to improve the quality of education. One of the steps taken by the government to improve the quality of education is through curriculum improvement. The curriculum is a crucial element in education to ensure the achievement of educational goals. In line with the development of the 21st century, the government developed the curriculum from the 2013 revised curriculum to the independent curriculum.

The Merdeka Curriculum essentially gives teachers freedom in developing curriculum and learning so that teacher creativity is increasingly open and accommodated to innovate to provide the best for students [2]. The Merdeka Curriculum focuses on the concept of learner-centered learning, so that students are able to face challenges in learning [3]. The Merdeka Curriculum must ensure that learners have equal educational opportunities, improve quality, and ensure the relevance and efficiency of education management to be able to face challenges at the local, national and global levels. To achieve this goal, education must be changed systematically and purposefully. One of the branches of science that is an important part of education is Physics.

Physics is a part of natural science that studies the environment in various forms of nature and natural phenomena and all their interactions [4]In studying natural phenomena, Physics has its own process that starts with observing, determining its measurements, analyzing and drawing conclusions from the surrounding environment [5]. Physics is not just a collection of facts, but also a process of interacting with the environment and understanding nature scientifically [6]. The success of the Physics learning process at school is determined by the collaboration between students, educators, and the availability of learning resources. One of the supporting learning resources in learning Physics is the use of teaching materials as a guide for educators and students in understanding Physics concepts in a structured and systematic manner.

Teaching materials are a set of materials that have been arranged systematically, so as to assist students in solving problems in learning [7]. Quality teaching materials are teaching materials that can provide students with the skills and knowledge needed to achieve competency standards [8]. The use of teaching materials in learning must be adjusted to the background of students, the characteristics of students and the learning style of students.

One type of teaching material that can support Physics learning is books. Books can be divided into two types, namely textbooks and non-textbooks. Textbooks are books that are the main source of learning and are compiled according to the curriculum [9]. While non-textbooks are books that support learning but the preparation of the book is not based on the existing curriculum. Based on Permendikbud No. 21 of 2023, this non-text book can be an enrichment book, reference, and guide.

Enrichment books are books that contain content with the aim of improving and enriching the mastery of science and technology and skills, thus influencing educators, education managers, students, and other reading communities [10]. The preparation of this enrichment book is not fully based on the curriculum both from the objectives, materials and methods of presentation. Enrichment books can be used as a support for mandatory textbooks in learning Physics to enrich, add and deepen students' understanding. This Physics enrichment book can be developed from the results of analyzing Physics concepts that exist in the natural environment, regional potential, tourist attractions and local wisdom or can be called an *edupark*.

Edupark can be interpreted as an educational park, which means a park that is used as a learning resource by observing and finding learning concepts in it. Edupark is expected to be an interactive, fun, and up-to-date learning resource [11]. Edupark has indirectly answered one of the challenges of the 21st century, namely creating product innovations that are useful for improving the quality of education in Indonesia [12]. Each region in Indonesia has unique regional potential. Including in West Sumatra, there are many potential areas and tourist attractions that can be used as learning parks.

West Sumatra with its natural and cultural wealth can be utilized as a tourist destination as well as education. Some developments related to Physics eduparks in West Sumatra include Mifan Waterpark Padang Panjang [13], Padang Beach [14], Bukit Chinangkiek Solok [15], Rumah Gadang Istana Rajo [5], Painan Beach [16], Rantai Cave and Lareh Sago Halaban Lake Cave [6], Batang Tabik Waterpark [17], West Pasaman Sasak Beach [18]. Based on some of these edupark developments, until now there has been no development of teaching materials that discuss Jam Gadang Bukittinggi as an edupark facility. Preserving local wisdom in learning is an effort to introduce good and cultural values to students through the learning process [19]. Therefore, to develop an effective Edupark Enrichment Book, a deep understanding of the preferences of the needs of students at SMAN 1 Lareh Sago Halaban is needed.

Jam Gadang is a tower building located in the heart of Bukittinggi City, West Sumatra Province, Indonesia. At the top of this tower there is a clock that has a large diameter, hence the name Jam Gadang because in the Minang language "Gadang" means large. Jam Gadang, which is an icon of Bukittinggi City, is unique in that it was built without iron supports and cement mortar but remains strong until now and only uses a mixture of limestone, egg white and white sand [20] Jam Gadang contains many Physics concepts such as rotational motion, elasticity, pressure, work, energy, simple harmonic vibration, fluid and others. In addition, Jam Gadang was chosen because its location is known to many people, close to the school and access to the location is not difficult. Therefore, the utilization of Jam Gadang as a learning resource in the edupark can be used as a study for learning Physics.

Thus, this research not only aims to analyze the initial needs of students in learning, but also paves the way for broader educational innovation at SMAN 1 Lareh Sago Halaban. Through the integration of physics learning with the Edupark concept, it is expected to create physics edupark learning materials that not only increase learning effectiveness, but also foster students' love for the learning process itself. More than that, this research is expected to develop an enrichment book as a learning resource that supports the learning process at school and also as a companion book that expands or deepens the material from the textbook, provides additional information, examples, and practical applications. Enrichment books are designed to enrich and improve mastery of science, technology, arts, and relevant skills.

II. METHOD

This research is a descriptive analysis conducted at SMAN 1 Lareh Sago Halaban involving 56 students in Phase F and a physics teacher, while the selected tourist attraction is Jam Gadang Bukittinggi. The method of writing this article is descriptive analysis by integrating sports tourism destination Sport Center Padang Panjang in using physics concepts using Concept Fitting Technique. These steps follow the steps of developing edupark-based teaching materials known as EDUPARK steps. The development of teaching materials begins with preliminary research. The EDUPARK step consists of 7 steps, for the research stage is EDU and the development stage is PARK. The EDUPARK steps are Edupark Finding, Direct Observation, Understanding of students, teachers, and curriculum characteristics, Preliminary Design by Concept Fitting Technique, Auto Assessment, Recommendation from Expert, and Kick Off Publish [21]. The stages used in this research are only

up to the EDU stage, while the stages used are stage 1: 'E' (Edupark finding), which is choosing a tourist attraction or area that has the potential to be used as an edupark; stage 2: 'D' (Direct Observation), which is making direct observations to the location of the selected tourist attraction; stage 3: 'U' (Understanding of students, teachers, and curriculum characteristics), which is analyzing the characteristics of teachers, students, and curriculum; and stage 4: integrating the EDU stage to carry out the pre-design stage of the Jam Gadang edupark enrichment book.

Data analysis from the questionnaire used a Likert scale. The Likert scale used is (1) strongly agree (2) agree (3) doubt (4) disagree. The data analysis technique uses equation 1.

$$skor = \frac{total\ skor}{skor\ maksimum} \times 100\% \quad (1)$$

Analyze the data to evaluate the need for each indicator through the use of the provisions in Table 1.

Table 1. Categories of needs analysis

No.	Category	Value
1.	Very good	80 < N ≤ 100
2.	Good	60 < N ≤ 80
3.	Simply	40 < N ≤ 60
4.	Less	20 < N ≤ 40
5.	Very less	≤ 20

(Source: Ref[22])

The selected tourist attractions will be used as eduparks for physics learning. Data collection is done through observation and literature study. Photo and video documentation of Jam Gadang obtained from observation is matched with physics material in the Merdeka Curriculum. If the EDU stage has been completed, it can be continued with the next stage, namely by using the Concepts Fitting Technique to develop the material contained in the Jam Gadang object. Concepts Fitting Technique is a technique developed so that all relevant elements, such as physics concepts, tourist attractions (eduparks), and student needs, can be closely interrelated so that an edupark-based product can be created.

The stages of Concept Fitting Techniques are 1) analysis of physics materials that will be integrated and derive concepts, 2) analysis of Jam Gadang environment, 3) analysis of edupark that will be derived from Padang Panjang Sport Center environment, 4) generating physics materials that will be integrated with Padang Panjang Sport Center edupark by matching relevant physics concepts, 5) generating physics learning through Padang Panjang Sport Center edupark. The stages of Concept Fitting Technique can be seen in Figure 1.

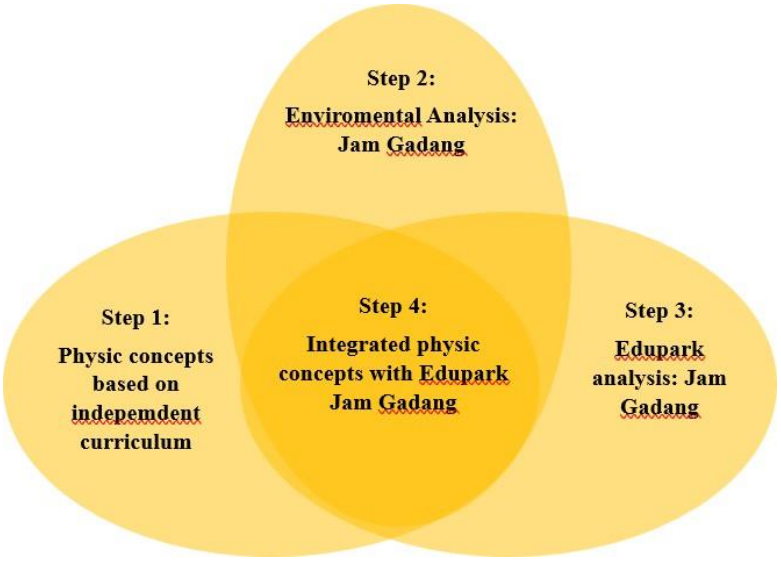

Fig. 1. Steps to Analyze Sport Center Padang Panjang Edupark with Concept Fitting Technique

III. RESULTS AND DISCUSSION

Based on the results of teacher analysis through interviews with two Physics teachers of SMAN 1 Lareh Sago Halaban, it was found that the school has implemented the Merdeka curriculum since 2022. Then it is known that so far students who have passed the learning objectives are rarely carried out enrichment programs and there are no learning resources in the form of enrichment books at school. Most books used in schools have not been fully integrated with the dimensions of attitude, spirituality and local context. So that other books that are interesting and easy to understand are needed to support the teaching and learning process. The use of books that link subject matter to the environment around students such as tourist attractions has never been used by teachers before. So this environment-based book is needed for students to be able to relate phenomena that occur in life to the concept of Physics. To create independent learning for students, and implement learning that involves students in everyday problems has not been optimized by teachers. Based on the results of the interviews conducted, it was found that the solution that the researchers offered was an enrichment book about the concept of physics at the Bukittinggi Gdang Clock.

Based on observations at SMAN 1 Lareh Sago Halaban, the results of the analysis of the questionnaire distributed to students about learning styles were obtained as shown in Table 2.

Table 2. Learning Style Questionnaire Analysis Results

Learning Style	Number of Learners	Percentage
Visual	31	55%
Audio	4	8%
Kinesthetic	14	25%
Audio-Visual	1	2%
Visual-Kinesthetic	3	5%
Audio-Visual-Kinesthetic	3	5%
Total	56	100%

The results of analyzing the data collected from the questionnaire show that the distribution of learning styles of students at SMAN 1 Lareh Saho Halaban has a significant variation. Of the 56 learners involved in this study, it was found that 55% of the learners, namely 31 learners, had a visual learning style. Meanwhile, 25% of learners were found to have kinesthetic learning styles, 8% had audio learning styles, 5% had visual-kinesthetic learning styles and 2% had audio-visual learning styles. And 5% of learners were found to have a combination of the three learning styles, namely audio-visual-kinesthetic, which shows flexibility in absorbing and understanding material through various learning methods. The above results prove that everyone has two learning styles, this is because everyone has different personal characteristics and intellectual abilities [23]. In addition, cultural, social, technological and learning habits influence a person's learning style.

Based on Table 1 above, the visual learning style dominates over the others. In line with previous studies conducted by Erniyanti (2022) [24]who also observed the learning styles of high school students, it was found that students tend to process information better when they see it (visual). This has important implications for the development of teaching materials for classroom learning. For this reason, suitable teaching materials should be used in printed form such as enrichment books and other teaching materials that emphasize visual displays to help students' understanding. These teaching materials are presented with attractive visuals such as infographics, videos, and diagrams [25]. Meanwhile, to support the auditory learning style of learners, it can be more active in group discussions and encourage learners to read aloud. Meanwhile, to strengthen kinesthetic learning styles, demonstration methods can be used and provide more opportunities for learners to do hands-on practice [26].

Then the results of the questionnaire from students regarding teaching materials can be seen in Figure 2.

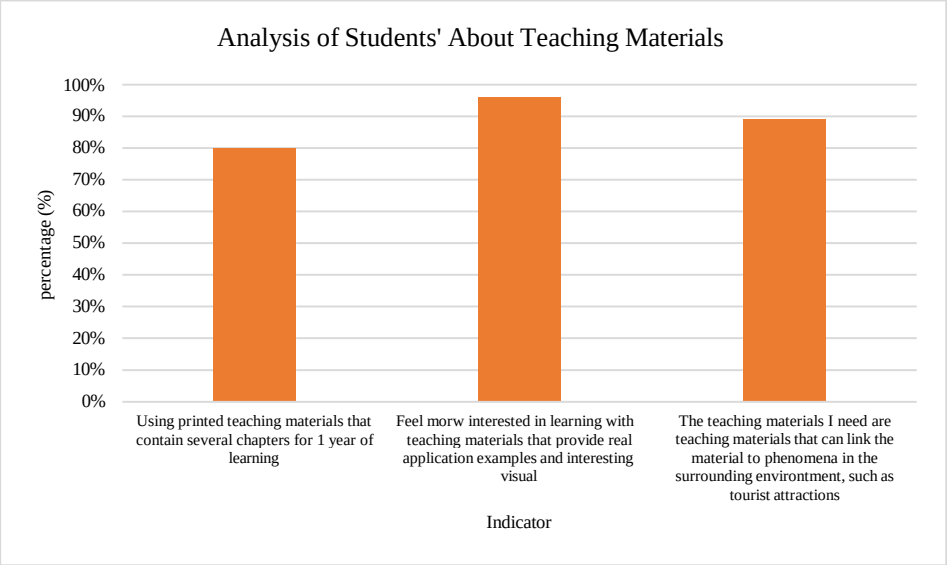

Fig. 2. The Results of the Analysis of Students' Questionnaires About Teaching Materials

The results of the questionnaire regarding Physics teaching materials in Figure 2 show that teaching materials that are often used in schools are printed teaching materials and also teaching materials that contain conclusions, summaries and certain materials only. While the use of teaching materials that encourage exploration and development of students' interest in certain topics is still relatively rare. In addition, students feel that they need teaching materials that can relate material to phenomena in the surrounding environment and provide real applications with interesting visuals in learning Physics. Teaching materials that utilize this environment can also develop students' attitudes, knowledge, and skills in applying physics concepts in everyday life.

The results of the students' questionnaire regarding Edupark learning, students have an interest in learning by utilizing the environment, especially based on tourist attractions as a learning resource, can be seen in Figure 3.

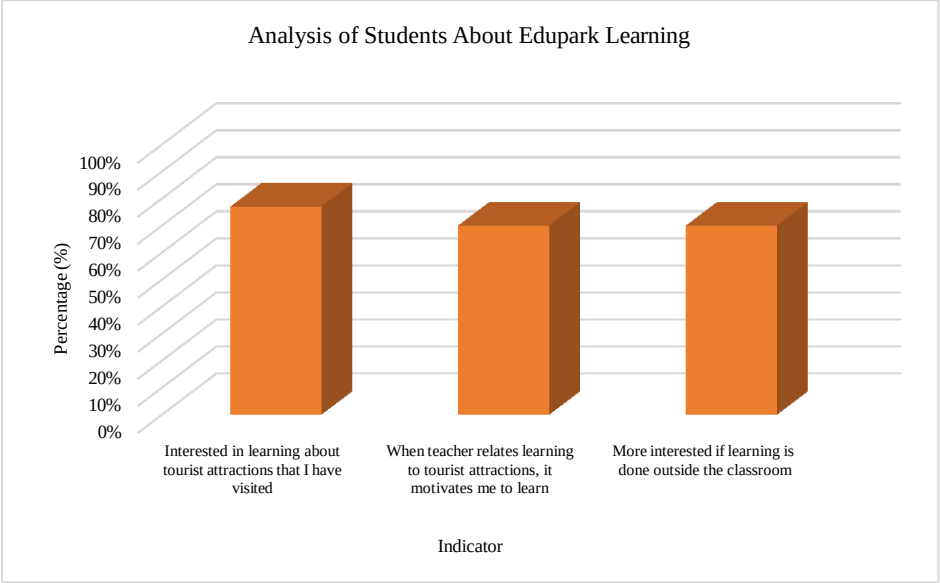

Fig. 3. The Results of the Analysis of Students' Questionnaires About Edupark Learning

Environment based Figure 2 learning is one of the attractions that makes students' learning motivation increase. Through this edupark integrated pedagogical material, students can learn even more actively and the teacher's role becomes a facilitator in line with what is needed. Learning with an environment-based approach allows students to gain understanding and skills through direct observation and application of concepts that are

relevant to the surrounding conditions [27] Developing teaching materials integrated with edupark tourist attractions can be one of the interesting learning strategies to be applied in schools.

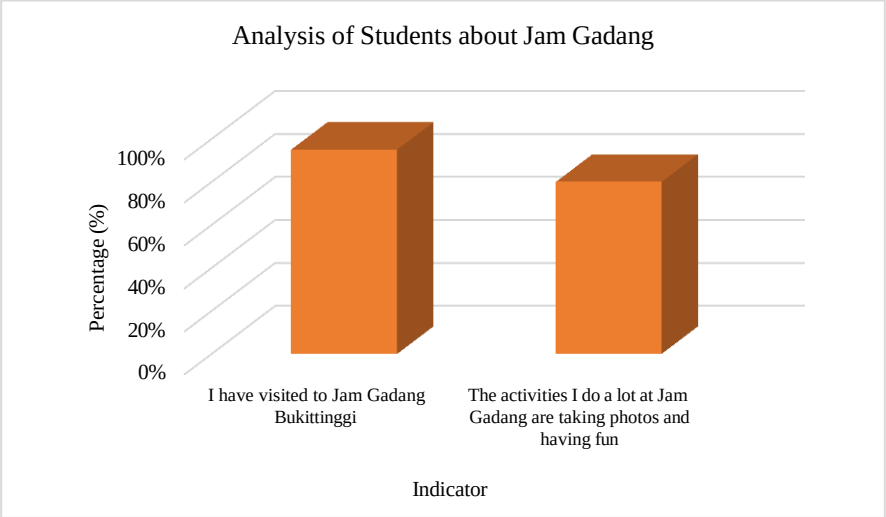

Fig. 4. The Result of The Questionnaire Analysis of Students about Jam Gadang

Based on the results of the questionnaire analysis in Figure 4 above, students can see that regional potential needs to be developed as a source of learning, because students are so enthusiastic about visiting tourist attractions. It can be seen that 95% of students have visited Jam Gadang. This tourist attraction has become one of the tourist destinations that must be visited by students during *study tours* for shopping, playing and taking pictures. However, this tourist attraction has not been utilized as a learning resource, especially in learning Physics. This Jam Gadang tourist attraction is very suitable to be used as a Physics *Edupark*, because there are many Physics concepts in each ornament.

After observing the Jam Gadang Bukittinggi, there are several parts of the object that can be used as learning for certain physics concepts. Utilization of tourist attractions for edupark as a place to learn can be done by identifying physics concepts in the Jam Gadang tourist attraction. Jam Gadang tourist attraction has various components such as buildings, building stairs, gears and many more. For more details can be seen in Figure 5.

(a) (b)

(c) (d)

Fig. 5. (a) building of Jam Gadang; (b) the bell; (c) gear; (d) building stairs

The following is the identification of physics concepts in Jam Gadang Bukittinggi.

Table 2. Identification of Physics Concepts in Jam Gadang

Ornaments	Physics Concepts
Building (materials, stability and structure)	Gravitational force, gravity and normal force, balance of a rigid body, force elements, pressure effort, potential energy, kinetic energy, mechanical energy.
Stairs (outer stairs and inner stairs)	Weight and normal force, friction force, effort, potential energy, kinetic energy, mechanical energy,
Gabion roof	Slope, Temperature and Heat, Expansion
Clock hands	Inertia, torque, rotational motion.
Gears (geer)	Inertia, torque, rotational motion.
Clock chimes	Simple harmonic vibrations, Sound waves, resonance and dopler effect.
Clock pendulum	Simple harmonic vibration.
Ballast iron	Gravitational force, effort, potential energy, kinetic energy, mechanical energy, pulleys.

Based on the analysis of students' learning styles, it is found that the most dominant visual learning style, so the appropriate teaching materials are printed media. From the results of teacher interviews, it was concluded that teaching materials in the form of physics edupark based enrichment books had never been used or developed by teachers. Learning is always carried out in class so that children feel bored.

From the results of the analysis of the discovery of attractions, it was found that the Jam Gadang tourist attraction could be used as an edupark. After direct observation to the tourist attraction, many physics concepts were found. These concepts can be developed into teaching materials in the form of enrichment books that deepen students' knowledge related to the application of physics in everyday life contextually.

Knowledge enrichment books are a type of book that aims to broaden the readers' horizons, both directly related to the material taught in educational institutions and beyond. This book is designed to support the development of learners' cognitive abilities. Enrichment books are flexible, meaning they can be used in the long term. Even though there is a change in curriculum, enrichment books can still be used because they are not tied to the curriculum. The position of enrichment books in the independent curriculum is as content differentiation. Content differentiation is a learning method by providing material to students based on students' skills, learning profiles, and knowledge.

IV. CONCLUSION

Based on the preliminary research data that has been conducted, it can be concluded that the enrichment program is an important part of meeting the demands of the Merdeka Curriculum. Based on the results of the needs analysis conducted at SMAN 1 Lareh Sago Halaban, it has implemented the Merdeka curriculum, then found Jam Gadang tourist attraction which has physics concepts that can be used as learning objects. From the results of teacher interviews, enrichment books have never been developed at school, in fact students need learning resources for enrichment programs to deepen students' insights and knowledge. And students feel more interested in learning in the edupark. The conclusion of this research is the need for the development of physics edupark enrichment books integrated with tourist attractions.

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