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Preliminary Analysis of Learning Media Based on Edupark Physics Sport Centre Padang Panjang by Using Concept Fitting Technique

Meila Sari[1*], Hamdi Rifai[1], Fatni Mufit[1], Dea Stivani Suherman[1]

[1] *Department of Physics, Universitas Negeri Padang, Jl. Prof. Dr Hamka Air Tawar Padang 25131, Indonesia*
Corresponding author. Email:meilasari260503@gmail.com

ABSTRACT

Learning resources that utilise tourist attractions are called eduparks. Edupark is a term derived from a combination of two words, namely educational which means education or education, and park which means park. The edupark concept includes functions as a place to play, exercise, relax, communicate socially, and have a picnic. Learning resources that utilise tourist attractions are called eduparks. Edupark is a term derived from a combination of two words, namely educational which means education or education, and park which means park. The edupark concept includes functions as a place to play, exercise, relax, communicate socially, and have a picnic. This research is a study to find learning resources using the EDUPARK step which is limited to the EDU stage. The data in this study were obtained from the results of needs analysis through interviews with physics teachers and 120 students of SMAN 1 Padang Panjang. The results obtained from the Edupark Finding step found that one of the attractions that can be used is the Padang Panjang Sport Centre. After direct observation through the Direct Observation stage, many physics concepts were found that could be used as physics learning objects. The results of the stage of analysing the characteristics of teachers, students, and curriculum show that teachers have not developed edupark-based teaching materials, while students have a high need for enrichment books that connect physics concepts with real life. Based on the results of interviews and questionnaire analysis, edupark-based enrichment books can deepen students' knowledge insights by presenting physics concepts in a more real learning experience. Therefore, the development of edupark-based enrichment books is expected to be an effective solution in supporting the implementation of Merdeka Curriculum and increasing students' interest in learning physics.

Keywords: Edupark; Enrichment Book; Concept Fitting Teqnique.

I. INTRODUCTION

Physics is one of the branches of Natural Sciences that studies all objects in nature either physically or mathematically written so that they can be understood and utilised properly by humans[1] . This science is closely related to observation and experimentation [2]. As a scientific discipline, physics studies various natural phenomena through scientific processes based on scientific attitudes, producing scientific products composed of concepts, principles, and theories [3]. These scientific activities include making observations, formulating problems, making hypotheses, conducting experiments, drawing conclusions and discovering theories and concepts.

Physics learning has the characteristic of guiding students in acquiring knowledge through data collection, experimentation, and observation of natural phenomena. This process requires learners to understand physics concepts by observing natural phenomena and finding relationships that can be used for problem solving [4]. The learning process is not only designed so that students can understand and discover concepts, laws or principles based on the stages of learning [5]. However, Physics learning is designed to play an important role in developing scientific research thinking, scientific learning, and scientific attitudes in students [6].

The learning process is not only limited to written materials in the classroom, but also involves the interaction of learners with their environment, teachers and learning resources. Environmental learning is one of the effective ways to achieve meaningful learning, especially in studying natural sciences such as Physics. Environmental

learning refers to activities where learners see their environment, both in school and outside of school [7] . Learning in the environment brings learners closer to their surroundings, so they can more easily understand science concepts that are directly related to everyday life. Learning activities carried out in nature provide direct experience to learners, so that their understanding of Physics concepts becomes deeper. Thus, this process not only improves the quality of learning, but also improves understanding directly.

One of the latest innovations in education in Indonesia is the implementation of Merdeka Curriculum, which offers a more flexible learning approach than the previous curriculum. The flexibility of learning aims to provide freedom for students and educators in determining how to learn according to their individual needs and potential. The Merdeka Curriculum focuses on the concept of learner-centred learning, so that students are able to face challenges in learning[8] . Strengthening competence in learning The Merdeka Curriculum provides opportunities for students to connect the concepts or theories they learn with the environment or life around them [9].

Learning resources that utilise tourist attractions are called eduparks. Edupark is a term derived from a combination of two words, namely educational which means education or education, and park which means park. The edupark concept includes functions as a place to play, exercise, relax, communicate socially, and have a picnic. Educational tourism is a type of tourism that combines recreational activities with the learning process, thus providing a useful experience both in terms of tourism and knowledge [10]. Thus, an edupark can be defined as a park designed to be a learning facility, combining recreational and educational activities in one location.

The diversity of regional potential needs special attention from the government so that children are able to master their potential and develop it in accordance with global demands [11]. The utilisation of eduparks as a learning resource, either through natural or artificial attractions, can be an effective strategy to change the negative mindset towards physics. Eduparks can develop students' attitudes, knowledge and skills in applying physics concepts in everyday life. Physics is often perceived as a boring, difficult, monotonous and rigid subject. Physics learning can be delivered in a fun and contextualised atmosphere [12]. By presenting an edupark as a learning tool, students can not only understand Physics concepts more deeply, but also feel the fun in the learning process. This not only increases their interest in learning, but also strengthens the connection between Physics theory and its application in real life.

The existence of edupark as a learning resource will make physics learning fun [12] and easy to understand. There have been many Physics Edupark developments such as Sasak Beach West Pasaman [13], cave tourism destination [14], Hot Waterboom Solok Selatan [15], Batang Tabik Waterpark [7] , Science and Technology Centre Sawahlunto [11], Sarasah Kajai Waterfall [4], Geopark of Ranah Minang Silokek [16], Destination Rumah Gadang Istana Rajo Balun Solok Selatan [17], Anai Land [18], Padang Beach [19], Garden at SMAN 2 Lubuk Basung [20], Chinangkiek Hill [21], Sianok Canyon [22], Janjang Seribu and Merah Putih Mountain Sulit Air [23] .

One of the most important components in the educational process is enrichment teaching materials. In the Merdeka curriculum, the use of enrichment teaching materials is included in the application of differentiated teaching types, namely through content differentiation. Advanced students are given the opportunity for enrichment. This shows that enrichment is one of the most important components in running the Merdeka curriculum. Management evaluation in the Merdeka curriculum, among others, is based on how to compare student learning outcomes with the criteria for achieving learning objectives. To find out these achievements, several methods are used, including using rubrics that can identify the extent to which students achieve learning objectives. Learners who have good learning outcomes, allow them to follow further learning and get enrichment programmes.

The Enrichment Programme can be interpreted as providing an expansion of experiences or activities identified by students beyond the mastery of learning determined by the curriculum. By taking into account the principle of individual differences (initial ability, intelligence, personality, talent, potential, interest, learning motivation, learning style), the enrichment programme is implemented to fulfil children's rights. One type of enrichment programme is involving learners in exploratory activities that are still relevant to the material presented. One of the enrichment programmes that can be implemented is reading books.

Enrichment books have an important role as learning resources that support the learning process at school. Enrichment books function as a companion that expands or deepens the material from the textbook, providing additional information, examples, and practical applications. Enrichment books are designed to enrich and improve mastery of science, technology, arts, and relevant skills [24]. In addition, this book also aims to help shape the personality of students, educators, education managers, and the wider community. The preparation of this enrichment book is not fully based on the curriculum in terms of objectives, materials and methods of presentation. As a nontextbook, enrichment books are often used in educational environments, but are not used as the main material in teaching and learning activities [25].

II. METHOD

The method of writing this article is descriptive analysis by integrating sports tourism destination Sport Centre 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 Assesment, Recommendation from Expert, and Kick Off Publish[26] . 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 to choose a tourist attraction or area that has the potential to be used as an edupark; stage 2: 'D' (Direct Observation), which is to make direct observations to the location of the selected tourist attraction; stage 3: 'U' (Understanding of students, teachers, and curriculum characteristics), which is to analyse the characteristics of teachers, students, and curriculum; and stage 4: integrating the EDU stage to carry out the pre-design stage of the Padang Panjang Sport Centre physics edupark enrichment book.

The measurement scale that will be used in this study to determine respondents is to use a Likert scale. The Likert scale used is with the highest score of 4 and the lowest score of 1. The data analysis technique uses qualitative and quantitative descriptive statistical analysis. Quantitative descriptive technique by calculating the percentage of the total score of respondents based on the assessment of each answer using Equation (1).

$$P = \frac{f}{N} \times 100\% \qquad (1)$$

Description:
P = final grade
f = gain score
N =maximum score

Data analysis of each indicator was analysed using the provisions in Table 1.

Table 1. Percentage of Category Division

Percentage	Category
0-25	Very Less
26-50	Less
51-75	Good
76-100	Very Good

(Source: Ref[27])

Data collection techniques include interviews, observation, analysis of physics materials. The research was conducted in January 2025. The research subjects were 2 Physics teachers and 120 students of Phase F of Physics Specialisation of SMAN 1 Padang Panjang, while the research object was Sport Centre Padang Panjang.

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 Padang Panjang Sport Centre obtained from observation was matched with physics materials in 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 Padang Panjang Sport Centre 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 the Padang Panjang Sport Center environment, 3) analysis of eduparks that will be derived from the Padang Panjang Sport Center environment, 4) generating physics materials that will be integrated with the Padang Panjang Sport Center edupark by matching relevant physics concepts, 5) generating physics learning through the Padang Panjang Sport Center edupark. The stages of Concept Fitting Technique can be seen in Figure 1.

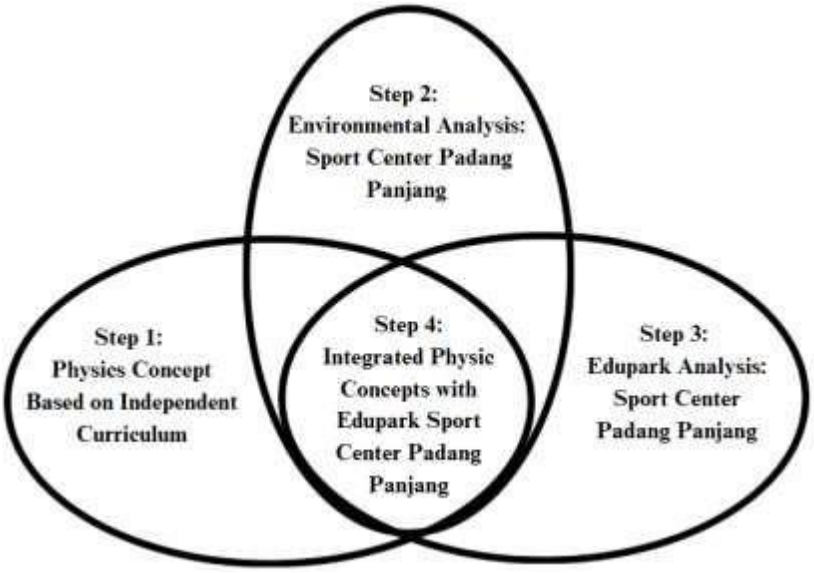

Fig. 1. Steps to Analyse Sport Centre Padang Panjang Edupark with Concept Fitting Technique

III. RESULTS AND DISCUSSION

Based on the results of teacher analysis through interviews with two Physics teachers of SMAN 1 Padang Panjang, 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 programmes and there are no learning resources in the form of enrichment books at school. Teachers experience obstacles to developing teaching materials due to limited time and must adjust to the characteristics of students. And it is also known that edupark-based teaching materials have never been developed. So it is necessary to develop an enrichment book based on a tourist attraction or local edupark so that it is hoped that this book can add insight to students who are more applicable in life so that physics material can be understood more deeply.

From the interview, it is known that physics learning is only limited to being carried out in the classroom and on certain materials in the laboratory. To create independent learning for students, and implement learning that involves students in everyday problems has not been optimised by teachers. Based on the results of interviews conducted, it was found that the solution that researchers offer is an enrichment book on physics concepts at the Padang Panjang Sport Centre.

The analysis was carried out on students in the form of learning style analysis, the need for enrichment books, knowledge of the Padang Panjang Sport Centre tourist attraction, and interest in learning at the edupark The results of the analysis of questionnaires distributed to Physics Specialisation students at SMAN 1 Padang Panjang regarding learning styles can be seen in Figure 2.

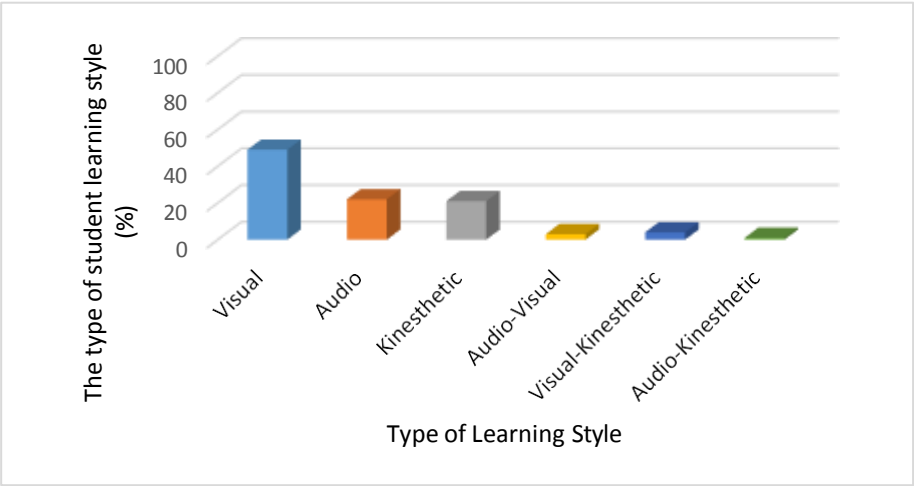

Fig. 2. Types of Student Learning Styles

The most dominant learning style owned by learners is the visual learning style of 49% where vision is the recipient of information and knowledge. Visual learning style helps learners focus their attention and concentration on the material being studied through seeing, looking at, or observing learning materials. Learners with a visual learning style will be helped to understand learning materials that contain elements such as infographics, videos and diagrams. The learning process of learners with visual styles can be assisted by printed media in the form of learning books, learning modules and other teaching materials[15] . By choosing teaching materials that suit their needs, the teaching and learning process can be more effective and efficient .[28]

Then the results of the questionnaire from students regarding teaching materials and enrichment books can be seen in Figure 3.

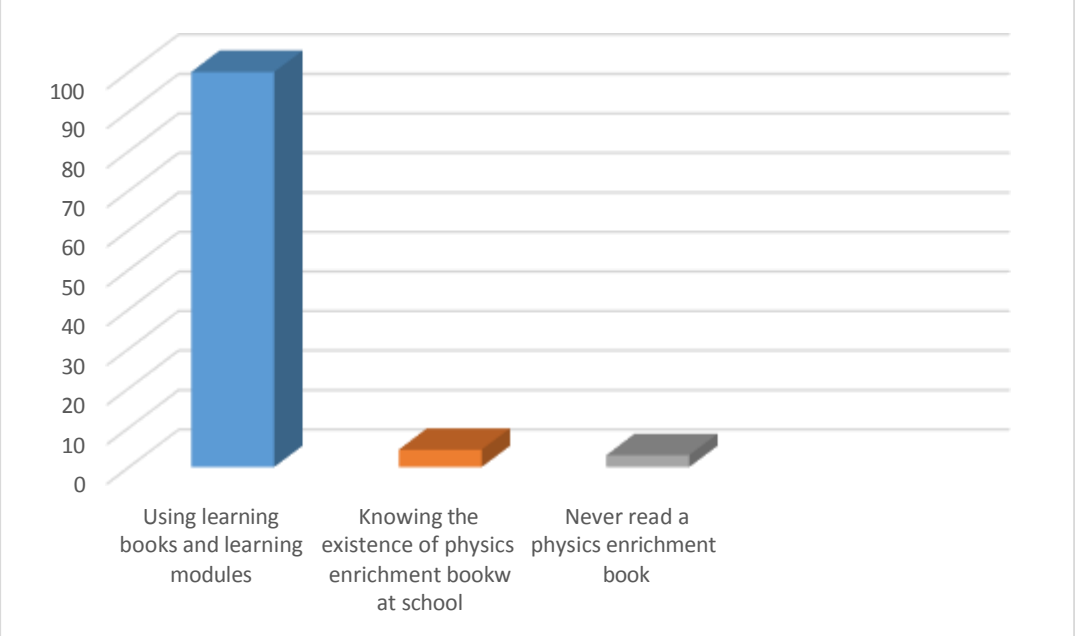

Fig. 3. The Results of the Analysis of Students' Questionnaires About Learning Media and Enrichment

From the analysis, it was found that students are used to using teaching materials such as books, modules and others in learning at school. It turns out that to support students who want to deepen their knowledge, there are no enrichment books available at school, so for those who will take part in the enrichment programme, there are no supporting learning resources available.

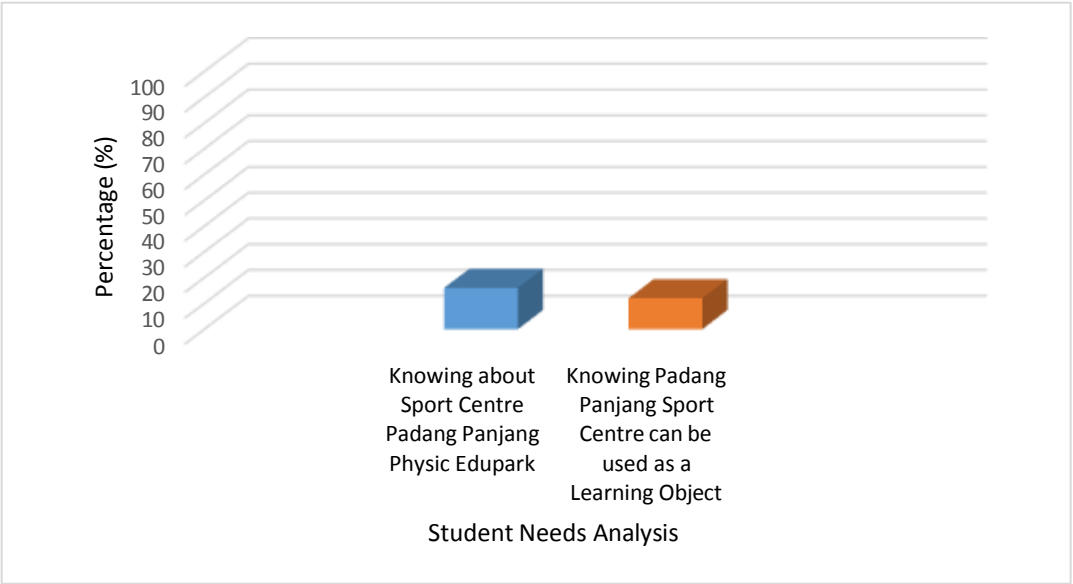

Fig. 4. The Result of The Questionnaire analysis of students about Sport Centre Padang Panjang

From the results it can be seen that there is still a lack of student knowledge of physics concepts in the selected tourist attraction which is around 16%, so the use of eduparks in the learning process is needed. Integrated learning with the surrounding nature can invite students to identify and explore related concepts, as well as challenge students to express physics concepts into everyday life Physics learning that is associated with real phenomena makes physics meaningful, and fun for students because what is learned is really around them.

After observing the Padang Panjang Sport Centre, there are several parts of the object that can be used as learning for certain physics concepts. The use of tourist attractions for edupark as a place to learn can be done by identifying physics concepts in the Sport Center Padang Panjang tourist attraction. The Sport Centre Padang Panjang sports attraction has a skatepark with various kinds, rock climbing venues, and skateboarding. For more details about the sports vehicle can be seen in Figure .

Fig. 5. Padang Panjang Sport Centre (a) rock climbing venue image "a" (b) skatepark bowl picture "b" (c) skateboarding game on inclined plane picture "c" (d) the back frame of the rock climbing venue picture "d"

When skateboarders are playing in Padang Panjang Sport Centre, there are many concepts that can be used as learning resources. The identification of physics concepts in Padang Panjang Sport Centre will be explained in terms of skatepark rides, skateboarding games, and rock climbing venues.

The rock climbing venue has several physics concepts in terms of climbing activities, and its building structure. The form of identification of physics concepts in Padang Panjang Sport Centre is described in Table 2.

Table 2. Identification of Physics Concepts in Rock Climbing Venue

Physics Concepts	Explanation
Vertical Motion	The concept of vertical motion in rock climbing is when the climber jumps down, falls, or releases the hold from the cliff. Vertical downward motion represents gravity, friction, and mechanical energy. Vertical motion is motion in the vertical direction, which is straight motion with regular changes assuming air resistance is ignored.

Physics Concepts	Explanation
Newton's law	- Newton's 1st law, *"An object will remain at rest or move in a straight line unless an external force acts on it."* In rock climbing, If a climber is stationary at a point, he remains stationary until he exerts a force to move. - Newton's Second Law, *"The acceleration of an object is proportional to the total force acting on it and inversely proportional to its mass."* In rock climbing, the greater the force exerted by the climber (e.g. by pushing harder with the feet), the greater the acceleration of the climber in moving upwards. - Newton's Law III, *"Every action has a reaction that is equal in magnitude but opposite in direction."* When a climber presses his foot against a cliff wall to propel his body upwards, the wall exerts an equal reaction force in the opposite direction, allowing the climber to ascend.
Weight and normal force	The concepts of gravity and normal force are applied to rock climbing in how the climber interacts with the cliff face. Weight determines how much force must be exerted for the climber to stay on the cliff. Normal force helps the climber stay on the cliff. The greater the normal force, the greater the friction which helps the climber hold on.
Friction force	Frictional force is one of the main factors that determine a climber's success and safety when moving on a climbing wall. Frictional forces occur between hands and holds, as well as between feet and footholds, which help the climber stay stable and prevent slipping.
Effort and Energy	- Effort, effort in physics is defined as energy to make changes. One application of effort in rock climbing is when a rock climber successfully climbs to the top of the cliff. - Potential energy, the concept of potential energy in rock climbing is applied to the position/height of the rock climber. The higher the climber's position from the ground, the greater the potential energy. If the rock climber's potential energy decreases. If potential energy turns into kinetic energy according to the principle of conservation of mechanical energy. - The concept of kinetic energy to apply the energy a climber has when moving. This kinetic energy mainly occurs when the climber performs movements such as jumping, moving hands or feet to a new position, or a falling situation occurs. - Mechanical energy, mechanical energy in rock climbing is applied by combining potential energy and kinetic energy. When the climber is in a certain position, all of his mechanical energy is potential energy. When the climber ascends, kinetic energy is converted into potential energy, and vice versa when the climber descends, potential energy is converted into kinetic energy.
Elasticity	- Rock climbing ropes usually use elasticated ropes to absorb the energy of the fall, a more elastic rope reduces the recoil when the climber falls, thus reducing the risk of injury.

In skateboarding games, there are physics concepts that are applied. A player who is playing in skateparks such as bowl rides, inclined plane obstacles, stair obstacles applies the appropriate physics concepts. The form of identification of physics concepts at the skatepark is described in Table 3.

Table 3. Identification of Physics Concept in Skatepark

Physics Concepts	Explanation
Newton's Law	- Newton's 1st law, the skateboard will stay at rest or move at a constant speed unless there is an external force. - Newton's 2nd law, the force exerted by the skater's foot creates acceleration on the skateboard - Newton's Law III, Newton's Law II The force exerted by the skater's foot creates acceleration on the skateboard
Friction force	- The friction between the skateboard wheels and the surface allows moving without slipping
Rotational motion	- Moment of force, The concept of moment of force on a *skateboard*, when performing a jump, the *skateboarder* presses against the back of the board to create a force. The further the force is applied from the axis of rotation, the greater the moment of force. Such as pressing the very back of the *skateboard* creates a greater moment of force than pressing the centre area of the board. - Moment of inertia, the moment of inertia of the board depends on the mass of the *skateboard* and the distance of the edge of the board to the axis of rotation (the centre point of the board). A skateboard with a smaller moment of inertia will be easy to turn, - Angular momentum, is the concept that allows *skateboarders* to perform rotational tricks angular momentum describes the tendency of a rotating system to maintain its rotation in the absence of external forces.

Physics Concepts	Explanation
Circular motion	- The rotation of the wheels on a *skateboard* is an example of circular motion, where each point on the wheel experiences either regular circular motion or circular motion changing depending on the condition of the *skateboard*.
Parabolic motion	- When performing a jump or trick in the air, the skater travels in a curved trajectory due to the influence of gravity.
Effort and energy	- Effort occurs when the force exerted on the skateboard causes displacement. - Kinetic energy is the energy that skateboards and skaters have when moving. - Potential energy is the energy stored due to the skater's position relative to the ground. - Mechanical energy, As the skater rises to the top of the ramp, kinetic energy turns into potential energy, then as they descend the potential energy turns back into kinetic energy.

The rockclimbing venue is composed of iron structures that ensure stability, strength, and safety. The form of identification of physics concepts on the back frame of the rockclimbing venue is described in Table 4.

Table 4. Identification of Physics Concepts in the Back Frame of Skatepark Rock Climbing Venue

Physics Concepts	Explanation
Balance	Metal structures should be designed so that they do not experience excessive moments, especially if the climbing wall has overhangs.
Material strength	The iron structure must be strong enough to withstand pulls and stresses, without undergoing permanent deformation.
Compressive force	The design must ensure an even distribution of forces to avoid weak points that could cause damage.
Friction force	The friction between bolts, joints, and metal surfaces ensures the stability of the structure.
Vibration	When a climber moves or falls, impulse forces occur that can produce vibration. Metal structures can be designed with vibration dampeners, such as flexible joints or additional materials that absorb impact energy.
The fulcrum	The fulcrum principle is applied to ensure the load is safely distributed to the base, preventing the structure from collapsing.

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 tourist attractions, it was found that the Padang Panjang Sport Centre 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 horizons of its readers, both directly related to the material taught in educational institutions and beyond. This book is designed to support the development of learners' cognitive abilities[29] . Enrichment books are flexible, meaning they can be used in the long term. Although 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 programme is an important part of meeting the demands of the Merdeka Curriculum. Based on the results of the needs analysis conducted at SMAN 1 Padang Panjang, it has implemented the Merdeka Curriculum, then found the Padang Panjang Sport Centre sports tourism object 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 programmes 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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