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Implementation of the Physics Edupark Concept for Pre-Design of a Physics E-Book Based on Local Potential and the Quality of Physics Tourism Education

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Abstract: The implementation of digital technology has had a significant positive impact on education by expanding access to learning, allowing students to learn anytime and anywhere digitally. This study aims to observe and analyze the edupark at the Bukit Langkisau tourist attraction and the relationship between physics materials and the tourist attraction. After the analysis, this Edupark e-book can be developed. The results of this study indicate that printed books are still predominantly used in schools, and the use of non-printed books is still lacking; the average results of student knowledge and skills are still low; learning materials integrated with Edupark at tourist attractions are still rarely used; and have not been able to improve students' digital literacy. The conclusion of this study is the need to develop an integrated physics education e-book at tourist destinations. The Bukik Langkisau tourist attraction has the potential to be used as an educational park for learning, but has not been optimally implemented due to difficult access to the tourist location. Therefore, the purpose of this study is to develop an integrated physics education park e-book at the Bukit Langkisau tourist attraction.

Keywords: Digital Literacy; E-book; Edupark; Langkisau Tourist Destination; Physics

Introduction

The development of digital technology has had a significant positive impact on education, expanding access to learning, enabling students to learn anytime and anywhere digitally (Yurchenko et al., 2023). Digital technology allows students to access learning materials that were previously difficult to access. Technology makes learning more flexible, no longer limited by time and place. Learning becomes more interactive because teachers use videos, animations, simulations, and educational games to explain material, making students more interested and easily understand difficult concepts (Allred & Murphy, 2019; Anggraeni & Sole, 2018). Innovation in learning conducted in nature is important as a refresher and new variation in education (Furqon et al., 2023; Joshi, 2018). This aligns with 21st-century education, which emphasizes the importance of using technology in the teaching and learning process. This way, students do not just passively receive information, but are actively involved, think critically, and participate in enjoyable learning.

Education in the Industrial Revolution 4.0 era presents new challenges for the world of education, particularly in adapting learning to changes in the way students learn, think, and act, thus demanding creativity, innovation, and mastery of 21st-century skills such as collaboration, communication, and digital literacy (Lestari et al., 2022). In this context, literacy is not only interpreted as the ability to read and write, but also the ability to understand, evaluate, process, and communicate information critically to solve problems (Anjani et al., 2023; Damayanti & Yohandri, 2022). As technology advances, the concept of literacy has also

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evolved into digital literacy, which is essential to support learning that is more contextual, interactive, and relevant to future challenges.

The novelty this research lies in the development of digital teaching materials in the form of interactive e-books based on digital literacy that integrate contextual physics learning with real phenomena in the surrounding environment, so that learning does not only focus on theoretical concepts, but also connects physics with students' direct experiences. This research also presents innovation through the use of interactive media that supports 21st-century skills, such as critical thinking, creativity, collaboration, and communication, and is aligned with the implementation of the Independent Curriculum (Farida, 2021). Unlike previous research that generally focused on digital teaching materials or digital literacy separately, this research combines both in one learning product that is contextual, interactive, and oriented towards improving scientific literacy.

During the learning process, students are also required to play an active role (Widodo et al., 2020; Yadav, 2024). Active participation in learning allows students to be more directly involved in understanding the material and developing skills (Lisa et al., 2023). One way is to use learning resources. By using learning resources, students can work together in groups to solve physics problems through interactive discussions and collaboration. Physics learning is closely related to natural phenomena or contextual learning, namely learning that focuses on the real context of students' daily lives (Rifai, 2020). This aligns with student learning in the independent curriculum. Contextual learning is a learning concept that focuses on students' experiences and contexts in the learning process to make connections between their knowledge and its application in everyday life (Serepinah & Marini, 2023).

Indonesia currently uses the independent curriculum, a student-centered approach where students play an active role in their own learning. In principle, the independent curriculum is expected to create a learning environment that empowers students to become competent, adaptive, and competitive individuals in the era of globalization. Curriculum implementation itself is the implementation of a curriculum consisting of content, objectives, learning materials, and methods used to organize the learning process to achieve educational goals (Salabi, 2020). One example is science learning, specifically physics learning. Physics is a subject within the field of science (Natural Sciences) related to facts, concepts, principles, and laws. Physics learning is a part of science that discusses nature and its phenomena, starting from the real (Doyan et al., 2023; Rahmawati et al., 2019). The rapid development of technology and information can be utilized to create or develop digital teaching materials.

By implementing physics learning with digital teaching materials, students can discover knowledge and understand concepts on their own. A common problem in the field is that physics learning remains low because it does not meet the demands of learning resources in this century, which often use digital books (Anwar et al., 2023). Many students still perceive physics material as merely theory and formula memorization, even though physics material teaches material based on phenomena that occur in everyday life (Hidayati et al., 2024). In the independent curriculum, teaching materials are designed that refer to contextual learning. One effort to implement contextual learning is through edupark-based learning. Utilizing eduparks as teaching materials, either through natural or artificial tourist attractions, can provide enjoyable learning.

An edupark is a tourist destination that can be used as an educational park to observe the application of learning concepts (Sadraini & Rifai, 2021). West Sumatra Province is one of the provinces with various potential tourist destinations that can be used or developed as eduparks. One of them is the tourist area in Pesisir Selatan Regency, specifically in Painan, namely the Langkisau Hill tourist area. The tourism potential of Langkisau Hill, one of which offers paragliding, can be optimized through a physics edupark e-book. The developed book is not tied to the material, allowing it to explain the physics concepts in Langkisau Hill more comprehensively than learning textbooks.

An e-book is a resource book containing material concepts and discussion questions summarized in electronic form and can be supplemented with learning videos, animations, and quizzes through other learning applications (Laksono & Hardiyanto, 2025). E-books are developed with an attractive and easy-to-understand display. E-books are expected to improve students' understanding of the material taught through contextual learning, and students can learn independently (Damayanti & Yohandri, 2022; Santoso et al., 2023). In addition, the developed e-book is accompanied by a systematic differentiation approach, so that students can learn to analyze problems and solve them sequentially. As a consideration in designing an e-book product on physics concepts in Bukik Langkisau, an initial test was conducted to analyze students' knowledge of activities.

The results of a questionnaire on students' knowledge of physics concepts regarding tourist destinations indicate that their level of knowledge is still low. Therefore, the Edupark enrichment e-book that will be developed will explain, examine, and convey information about physics concepts related to the Bukit

Langkisau tourist attraction (Hidayati et al., 2024). It is hoped that this Edupark e-book will serve as a guide for students in their learning and enhance their physics concepts as part of efforts to protect and preserve the tourist destination (Anjani & Rifai, 2024). Students can use e-books to support online learning and also as a means of conveying various information covering the subject matter to be studied. E-books incorporate digital technology, utilizing software and hardware (Novianti et al., 2025). Students can access them through electronic media such as mobile phones and other devices. Texts are designed and organized in PDF and document formats that can be viewed outside of a computer. Accessing e-books is expected to foster students' interest in reading during learning (Kusumawati et al., 2020).

The development of digital technology has had a significant impact on education, particularly on how students learn and interact with information. In today's digital era, digital literacy skills are a crucial competency for students. Digital literacy encompasses not only the ability to use digital devices but also critical thinking skills in accessing, evaluating, and utilizing digital information ethically and productively. The development of edupark e-books has been widely carried out, especially in the West Sumatra region, such as Mifan Waterpark Padang Panjang (D. P. Sari & Rifai, 2019), Harau Lima Puluh Kota Geopark (Yulia & Rifai, 2019), Semurup Kerinci Hot Springs (Anggara & Rifai, 2019), Padang Beach (Elvisa & Rifai, 2021), Rumah Gadang (Sadraini & Rifai, 2021), Ranah Minang Silokek Geopark (Ummah & Rifai, 2020) Anai Land (Delvi & Rifai, 2020), Bukik Chinangkiek Park (Lestari et al., 2022), Tabek Patah (A. P. Sari & Hamdi, 2021), Padang Ganting Hot Spring (Sufetri & Rifai, 2020). However, none of these edupark studies have explored paragliding as a tool for physics edupark. The design of this physics edupark e-book is tailored to student characteristics, in line with the principle of differentiation, as one of the demands of the independent curriculum is contextual (nature-based) learning.

However, the reality on the ground shows that students' digital literacy remains relatively low. Many students are adept at using technology for entertainment, but are unable to utilize it optimally for learning purposes, including in science subjects like physics. The lack of integration of digital media into learning and the limited availability of teaching materials that support digital literacy development are among the main causes. On the other hand, physics, as a science subject, is often considered difficult and uninteresting by some students. This is due to the still-theoretical learning approach and the lack of media that can connect physics concepts to real life. Yet, physics has great potential to be taught contextually through environmental approaches and hands-on exploration.

One innovative solution that can be implemented is the development of enrichment books based on digital physics eduparks. Eduparks are educational parks that combine learning with hands-on experiences in the surrounding environment. By presenting physics materials in interactive digital books based on the edupark context, students can not only understand physics concepts more easily but also improve their digital literacy skills.

Method

The research method used was the EDUPARK development model. EDUPARK is a type of R&D research. The research stage is EDU, and the development stage is PARK. Therefore, there are seven syntax/stages of EDUPARK development: Edupark Search, Direct Observation, Understanding the characteristics of teachers, students, and the curriculum, Initial Design using concept adjustment techniques, Self-Assessment, Product Quality Test Results, and Publication Launch (Kinanti & Hamdi, 2024). This research was conducted up to the publication launch stage.

In this study, the stages used only reached the EDU stage, where there are four phases involved in the research. Stage 1: 'E' (Edupark Discovery) selected a tourist attraction or potential area to be developed into an Edupark; Stage 2: 'D' (Direct Observation) conducted direct observations at the tourist attraction; Stage 3: 'U' (Understanding the Characteristics of Students, Teachers and the Curriculum) analyzed the characteristics of teachers, students and the curriculum; and Stage 4: Integration of EDU to carry out the pre-design steps for the Bukik Langkisau Physics Edupark e-book.

Once the EDU stage has been completed, the next step is to further develop the material contained in the Bukit Langkisau tourist attraction using the Concept Fitting Technique. The Concept Fitting Technique is developed from a combination of regional potential discoveries, field observations, and an understanding of educational needs. Thus, this model helps researchers produce educational products that are relevant, contextual, and based on local potential, resulting in the creation of physics edupark teaching materials. Instruments used for collected data is shown in Table 1.

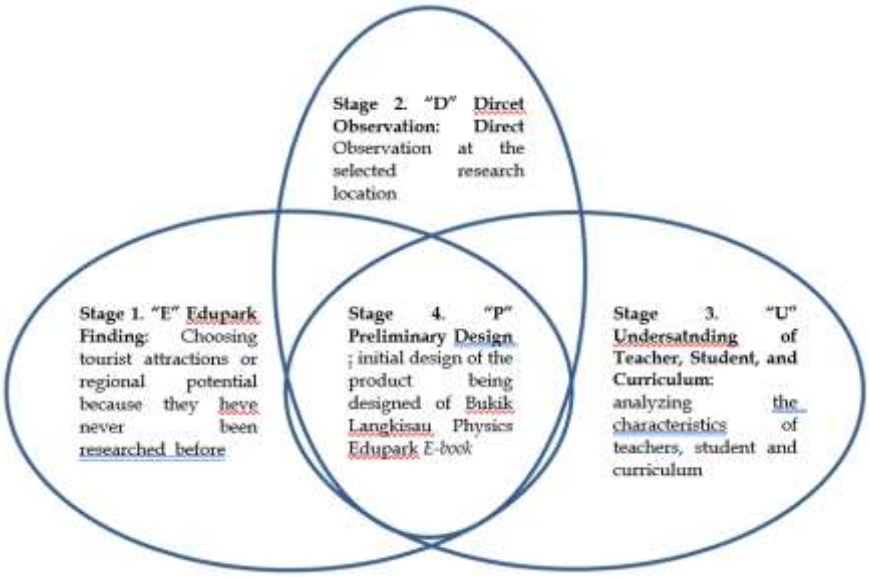

Figure 1. Stages of EDU Development Model at Edupark Object Bukik Langkisau Tourism

Data analysis techniques used for questionnaire analysis introduction is Likert scale. The Likert scale is used is no never, sometimes, often and always. Every aspect in questionnaire translated in a number of indicators. Calculation mark each indicator use equality following:

$$P = \frac{f}{n} x100\% \quad (1)$$

Explanation:
P = Final value
f = Gain score
N = Score maximum

Result and Discussion

Analysis Educator

The first analysis conducted was an analysis of educators. There were five aspects analyzed: creating teaching materials according to student and material needs, using scientific steps in learning, utilizing non-printed teaching materials, creating non-printed teaching materials, and applying digital-based learning in learning. The average results for each educator can be seen in the table.

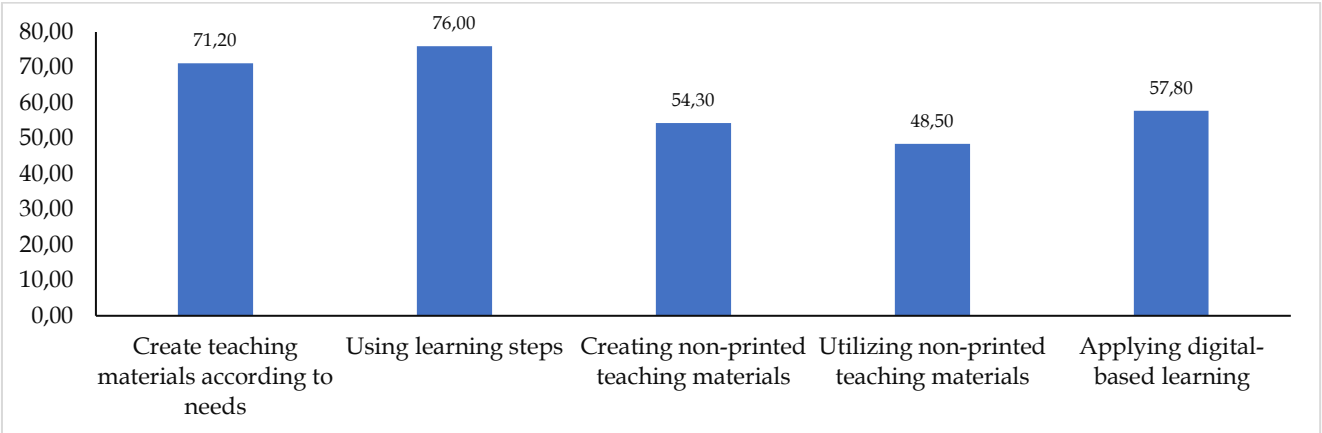

Figure 2. Results of the educator analysis

Based on the results of the educator analysis, it appears that educators have not adequately prepared teaching materials according to student needs. Furthermore, educators have not optimally utilized and created teaching materials in non-print formats. As a result, learning still relies on teaching materials in printed textbooks and Student Worksheets (LKPD). In the learning process, educators have not optimized the

use of digital teaching materials and technology in learning.

Analysis Students

The second analysis focuses on students. This analysis examines four aspects: knowledge, skills, digital learning, and the use of Android devices in the learning process.

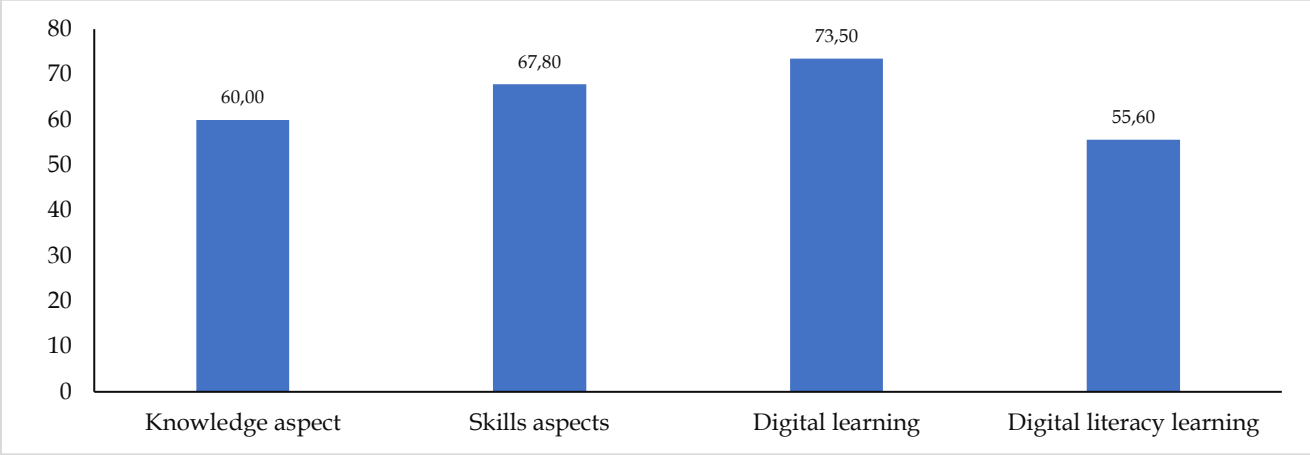

Figure 3. Student Analysis Results

Based on Figure 3, the total questionnaire analysis for the student knowledge aspect yielded a score of 60%. The skills aspect was also low, at 67.8%. This is due to the lack of practical work in the learning process at school. 73.5% of students engaged in digital-based learning, meaning that most students already owned smartphones and 55.6% of students engaged in digital literacy learning, but they had not yet optimized the application of digital literacy in their learning.

Analysis Material Physics

Material analysis was conducted with reference to the Independent Curriculum. Analyzing physics material can be directly integrated with tourist attractions and activities within the Edupark using the Concept Fitting Technique (Rifai, 2019). The material was analyzed based on the objects and activities contained within the Edupark tourist attraction concept that are suitable for Bukik Langkisau, which are related to physics competency-based learning. The analysis of physics material contained in the Bukik Langkisau tourist destination as shown in Table 2.

Table 2. Analysis Material Physics of Bukik Langkisau

Objects	Physics Material
Air Motion	Fluids, Density, Pressure, Viscosity, Bernoulli's Concept
Wind	Sea Breeze, Land Breeze, Fluids
Paragliding	Forces in Aerodynamic
Gliding Motion	Uniformly Accelerated Liner Motion
Energetics, Height	Energy Transformation, Kinetic Energy, Gravitational Potential Energy
Natural Physics	Ocean Wave Observation, Atmospheric Optics
Temperature	Sound Wave Speed

Based on Table 2, the attractions at Bukit Langkisau are beach attractions with a physics concept. These attractions incorporate the same physics concept as the learning achievements in the Independent Curriculum, meaning that a single attraction (CP) contains several objects with the same physics design (Roberts et al., 2021). Of these CPs, the most popular ones were selected and integrated into the attractions at Bukik Langkisau.

Conclusion

Research shows that printed textbooks and worksheets are still widely used in schools, while the use of non-printed teaching materials is still suboptimal. In addition, the average knowledge and skills of students are still relatively low, and integrated teaching materials based on Edupark have not been widely used in tourist destinations as contextual learning resources. Therefore, it can be concluded that the development of integrated physics e-books integrated with tourist destinations is

necessary to be used as an innovation in learning that is more interactive, contextual, and meaningful. Based on the conclusions, it is also recommended that the development and implementation of integrated physics e-books based on tourist destinations as an alternative digital teaching material that supports learning.

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Contribution writer including: conceptualization, data curation, formal analysis, methodology, and preparation of the initial draft, N.S and H.R.; validation and writing-review, and editing, H.R.; investigation, formal analysis, and visualization, N.S. All authors have read and approved the published version of the manuscript.

Conflicts of Interest
The author declares that he/she has no conflict of interest.

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