

## VALIDITY OF EDUPARK BASED ELECTRONIC PHYSICS MODULE HOT SPRING PADANG GANTING FOR SENIOR HIGH SCHOOL

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### ABSTRACT

Currently, the use of Padang Ganting hot spring attraction as a place to learn or commonly called Edupark (educational park) is very good to do. Because the covid-19 outbreak the learning process went from face-to-face to online so that the use of learning devices such as module also switched into the form of electronic modules. In order for the learning process to continue well, an electronic module is needed integrated with Edupark. This type of research is Design Research by using plomp model. It has three stages namely 1) preliminary research (initial investigation), consisting of analysis of educators, learners, potential regions and materials, 2) prototyping phase (prototype phase) consisting of formative evaluation and 3) assessment phase. This research was limited only to the prototyping phase until the validity test using validation instruments with likert scale. There were several aspects of eligibility assessed by expert lecturers, namely aspects of presentation eligibility, appearance, material and language. The results of data from expert lecturers was then processed using descriptive data analysis. The result of processing data obtained from validators in the aspect of presentation eligibility got a value of 93,06 with a very valid category, a appearance eligibility aspect got a value of 90,79 with a very valid category, a material eligibility aspect got a value of 76,39 with a valid category and a language validation aspect got a value of 78,33 with a valid category. Validation results of the five aspects of the Edupark hot spring Padang Ganting electronic module from material eligibility aspects, appearance eligibility, presentation eligibility and language validity were very valid category based on validity criteria according to Arikunto with a value of 84,64.

**Keywords :** *Electronic module, hot spring, physics*



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### I. INTRODUCTION

Physics learning aims to increase insight, knowledge and critical thinking skills through mastery of physics concepts and principles, so that physics can be applied in every aspect of life. In addition, physics learning also aims to form a positive attitude of students, namely an interest in studying physics more deeply. Advances in technology and the concept of life are based on an understanding of physics[1]. Physics is included in the science that pays attention to and understands physical symptoms and phenomena in nature. Understanding physics properly and correctly requires seeing and observing natural phenomena directly. Now what is being done is the use of tourist objects as a vehicle for learning or commonly called Edupark (educational park). The use of this playground is very good in applying it so that students are active and interested in learning physics. Learning at Alan or Edupark makes students understand that learning physics is fun learning[2]. Not only that, the rides found in tourist objects have physics material that can be used as additional knowledge by students. There are many tourist objects in the Ngarai Sianok Geopark that have scattered physics concepts and have the potential to be a source of learning physics[3]. These materials can be integrated into learning tools in the form of books, modules, student worksheet and others. Edupark textbooks make it easy for students to connect physics concepts with facts in the field, thereby increasing students' interest in learning physics[4]. To realize Edupark learning, Edupark-based learning tools are needed to support educators in learning activities. Learning devices play an important role because the selection of learning devices must be in accordance with the needs of students to be realized so that the use of learning tools runs as desired[5]. Learning devices are intended to vary, one of which

is in the form of teaching materials that make it easier for students to gain knowledge in school. Teaching materials are used to facilitate the learning process which can be in the form of hard or soft files[6]. The principles of teaching materials contain the following indicators: 1) provide knowledge and insight, 2) train thinking skills and 3) conclude. In addition, the use of learning devices will make learning more effective when combined with the use of learning media that are considered suitable for the character of students and are supported by school facilities.

In connection with the elements that must be present in learning for the learning process, a learning media is needed that changes the learning process from face to face to online learning. Moreover, this is supported because of the current covid-19 pandemic which requires students to continue learning but not face-to-face. So the need for the use of technology to make students continue the learning process. Now there are very many uses of electronic-based teaching materials such as using e-books. The development of electronic book technology has led to the merging of print and digital technology in the learning process, including the use of modules. Modules can not only be used in hard form but can also be converted into electronic form or in soft file form[7]. The electronic module has similarities with an electronic book. Electronic books consist of materials, pictures and videos that can be accessed electronically and can be used on devices such as laptops or gadgets. The term electronic module originates from the use of the term teaching materials which are converted into electronic form[8]. E-module is a teaching material in digital form in which there is learning material in the form of image simulation videos and interactive videos which are all suitable for use in the learning process[9]. Modules are useful for carrying out learning functions in which there is material that must be mastered. That is, modules are used in order to achieve the objectives of a lesson. In line with learning in nature that we discussed earlier, the use of modules that are integrated with Edupark is considered very good for improving attitudes, knowledge, skills, and adding insight to students. So that with the use of an electronic module integrated with Edupark, it makes students have broad insights and improves students' critical thinking.

Based on the results of preliminary observations at SMA Negeri 1 Batusangkar the real conditions in the field are not yet in accordance with the expected ideal conditions. There are three initial observations made, first using questionnaire sheets and interview sheets for educators, second questionnaires for students and the last direct observation in the field for material analysis and analysis of regional potential.

Based on the results of the preliminary study that had been done, it was found that the students' grades were still below the KKM, the low score of these students was because many of the students still did not understand the material being studied because students were also not interested in using conventional modules to learn because they felt less attractive and monotonous. Not only that, based on the questionnaire given to students, it was found that on average students have an audiovisual learning style, electronic modules play an important role in increasing interest and motivation of students to learn so that students' knowledge will increase, why electronic modules are very influential because in The electronic module contains learning videos, pictures, virtual practical experiments and online evaluations and this can support learning based on the characteristics of students' audiovisual learning.

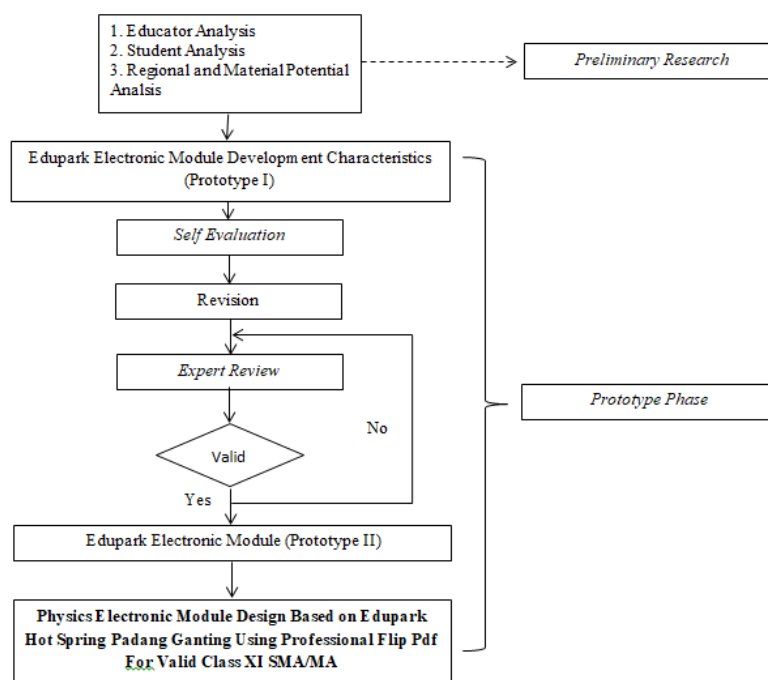
Before choosing the location of the Padang Ganting hot spring Edupark, an analysis of the potential of the area contained in the Batusangkar area and its surroundings was carried out. From the analysis, there are several choices of tourist attractions, namely the panoramic view of Tabek Patah, the Basa Pagaruyung Palace, the Padang Ganting hot springs and Singkarak Lake. Until the location of the Edupark which was chosen by many students was the Padang Ganting hot spring because the location of the Padang Ganting hot spring attraction was easy and close to visit. An analysis of the material contained in the Padang Ganting hot spring tourist attraction has been carried out, the material analysis carried out is guided by the 2013 curriculum.

After analyzing there are many materials that have been studied, one of the materials is Static Fluid and Heat Temperature. In the Static Fluid material that students must understand and control with the main material, namely Hydrostatic Pressure, Archimedes Principle, Pascal's Principle, Meniscus, Capillary Symptoms, Surface Tension, Stokes Law Viscosity. In the material temperature and heat that must be quasi by students, including understanding temperature, expansion, heat, changes in the form of substances, the relationship between changes in temperature and changes in form, the principle of black and transfer of heat. However, in learning, students still have difficulty solving problems because they have complex material concepts. This is because students do not understand the material properly and thoroughly due to the low desire of students to use conventional teaching materials. Therefore students need to be trained using Edupark-based electronic modules so that students are broad-minded and have critical thinking skills.

## II. METHOD

The type of research that is applied is Design Research using the Plomp model. The Plomp model is used because it fits the characteristics faced in the field. The advantages of this Plomp development model include; 1) it is more appropriate to use for research that produces products in the form of learning tools, models, and learning media. 2) the description is complete and systematic., 3) before being tested, the product will be revised by researchers and consulted with people who are considered more skilled; 4) individual and small group evaluation[10]. The research subjects were SMA N 1 Batusangkar with a population of 36 students of class XI SMA N 1 Batusangkar.

The research consists of several stages which will be introduced in more detail in Figure 1.



**Fig 1.** Research Procedure

Based on Figure 1, the research procedure with the Plomp model that has been carried out consists of three stages, namely 1) preliminary research, which consists of an analysis of educators, students, regional potential and material, 2) prototyping phase (prototype phase) which consisting of a formative evaluation and prototype revision and 3) an assessment phase. This research is limited to the prototyping phase until the validity test.

### 1. Preliminary Research (Preliminary Research)

#### a. Educator analysis

Performed by using a questionnaire sheet containing points in the form of activities in the learning process and the use of learning media. The second analysis using the educator interview sheet aims to be useful to see whether the students' abilities are good, have broad insight into physics and educators use tourist objects around the school location as a source of learning physics, use of electronic teaching materials that are integrated with tourist objects.

#### b. Student Analysis

Given instruments in the form of questionnaires to students. The instruments distributed contain aspects related to learning styles, the use of teaching materials, the Industrial Revolution 4.0, and the Education Park (Edupark). The instrument was given to 36 students from SMAN 1 Batusangkar.

#### c. Regional and Material Potential Analysis

Performed on objects or places that are familiar among the community, especially students. The analysis was carried out by observing directly into the field. Of the four choices of tourist attractions such as the Padang Ganting hot spring, Tabek Patah Panorama, Singkarak Lake and the Basa Pagaruyung Palace which were asked

of students, it was seen that students preferred to visit the Padang Ganting hot spring bath. As well as analyzing what material can be learned from the use of the Padang Ganting hot water vehicle. The analysis was carried out based on the material in accordance with the 2013 curriculum. The material contained in the 2013 curriculum was adapted to the Padang Ganting hot water vehicle.

## 2. Development or Prototyping Phase

### a. Design

The design stage was carried out by designing the electronic module of the Padang Ganting hot water Edupark which is located in the town of Batusangkar Tanah Datar. The making of this electronic module utilizes the Flip Pdf Professional application which can be accessed using a laptop or gadget (assisted by the Html Reader application).

### b. Evaluasi Formatif

#### 1) Self Evaluation

Before the product was validated by the validator, the researcher did a self-evaluation using the self-evaluation checklist sheet and with the research supervisor. The self-evaluation that was carried out covered many things starting from the module design starting from the inner cover of the module and the back cover of the module, editing video lessons, learning materials, Edupark integration and clarity and legibility of the module writing.

#### 2) Expert Review

The results of the validation of the Padang Ganting hot water physics electronic module were obtained from the results of the instruments filled in by the validators who came from three lecturers of Physics, Faculty of Mathematics and Natural Sciences, UNP. The validation test is used to test the advantages and disadvantages of the electronic module Edupark Padang Ganting hot water. After being assessed, the product will be revised so that it produces a product that is tested for its validity. The validation instrument used for the Edupark electronic module for Padang Ganting hot water consists of four aspects, namely aspects of material feasibility, presentation, display and language.

The instruments for the preliminary research stage were student observation questionnaires and teacher interview guidelines, while the instruments used for expert reviews were the validation sheet. The validation sheet is prepared based on the indicators of a good module. More details on the data collection instrument are described in Table 1.

**Table 1.** Validation Instruments

No	Stages	Instruments	Research Questions
1.	Preliminary Research	Educator analysis	What are the characteristics of
2.		Student analysis	Electronic Physics
3.		Analysis of Attractions and Materials	Module Based on Padang Ganting Hot Spring Edupark?
4.	Prototype Phase	Self evaluation	What is the validity level of Physics Electronic Module Based on Padang Ganting Hot Spring Edupark?
5.		Product validation	validation poll

Based on Figure 1. The research procedure with the Plomp model that has been carried out consists of three stages, namely 1) preliminary research, which consists of an analysis of educators, students, regional potential and material, 2) prototyping phase (prototype phase) which consisting of a formative evaluation and prototype revision and 3) an assessment phase. This research is limited to the prototyping phase until the validity test.

The data analysis stage uses descriptive data analysis by describing the validity of Edupark-based electronic modules. The data of the analysis results are processed with descriptive statistics. There are several aspects assessed by validators namely material aspects, presentation, appearance and language.

Validity is derived from the questionnaire of validation instruments filled by lecturers of Physics mathematics and natural science, UNP. Then the validation value of Edupark electronic module in Padang Ganting hot water physics is determined based on the criteria contained in Table 2.

**Table 2.** Product Validity Criteria

Number 100	Criteria
80 – 100	Very valid
66 – 79	Valid
56 – 65	Fairly valid
40 – 55	Less valid
30 – 39	invalid

(Arikunto, 2005)

$$\text{Score} = \frac{\text{Score Obtained}}{\text{Maximum Score}} \times \text{ideal Score (100)} \quad (1)$$

### III. RESULTS AND DISCUSSION

#### A. Result

##### 1. Preliminary Research Result

###### a. Educator analysis

The results of analysis on educators through questionnaires obtained that educators have done the learning process very well, in the utilization of learning media has been done with sufficient categories, and the utilization of tourist attractions as a source of learning has never been done with a category is very lacking. While through the interview sheet it is known that educators have done learning to improve the critical thinking of learners by providing HOTS questions, educators have also used teaching materials in the learning process but are still in the form of hard, and never done learning with electronic teaching materials while school infrastructure is adequate to support learning with electronic teaching materials.

###### b. Student Analysis

The results of the analysis of learners are obtained from the results of data processing obtained from the questionnaire that has been filled by the learner coupled with the results of the midterm exams of learners that can be used as a reference for the achievement of learning objectives in physics subjects. For more details from the initial observations of the learners are described in Table 3.

**Table 3.** Student Analysis Results

No	Indicators	Value	Category
1.	Aspects of knowledge of several classes		
	a. XI MIPA 1	67	Under KKM
	b. XI MIPA 2	60	Under KKM
	c. XI MIPA 3	65	Under KKM
	d. XI MIPA 4	67	Under KKM
No	Indicators	Value (%)	Category
2.	Visual and audiovisual learning styles are widely owned by students	78,2%	Good
3.	The use of electronic teaching materials is very attractive to students	89,4%	Good
4.	Ability demands of the industrial revolution era 4.0 students are still lacking	51%	Less
5.	Edupark teaching materials make students curious and interested in using them	70,3%	Good

Table 3 explaining that in the aspect of knowledge of learners in the midterm exams are still relatively low which can be seen in Table 3. all classes have midterm test scores under require score, whereas in terms of learning style of learners cenderung to audiovisual learning style with a percentage of 78.2% that is more interested in the use of learning videos, according to learners the use of electronic teaching materials is very interesting with a percentage of 89.4%, the ability of the Industrial Revolution Era 4.0 learners are still less category with a percentage of 51%, and the last student is very curious about the use of teaching materials based-Edupark with a percentage of 70.3%.

###### c. Analysis of Regional Potentials and Materials

The results of the observation of spaciousness were obtained from four choices of tourist attractions such as padang gantung hot spring, Panorama Tabek Patah, Lake Singkarak and Basa Pagaruyung Palace. Students are interested in visiting padang gantung hot spring because the attraction is in accordance with the physical

materials that the learners learned and the location of the Padang Ganting hot spring which is relatively close to the environment where the learner lives and is easy to reach.

Analysis of materials carried out based on the 2013 curriculum analyzed with padang ganting hot spring attractions obtained several materials related to physical materials such as in Table 4.

**Table 4.** Material Analysis

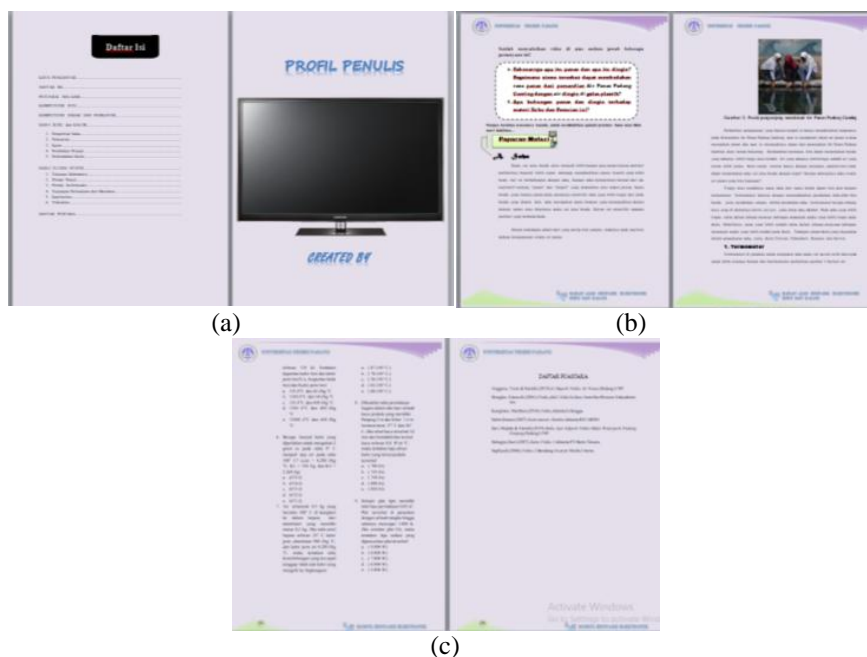
Vehicle	Concept Physics
hot spring pool	Hydrostatic Law, Pascal Principle, Prinsip Archimedes, Surface Tension, Meniskus, Kapilaritas and Viscosity
	Temperature, Seeding, Heat, Changes in Substance Form, Relationship between temperature changes and changes in form, Black Principle and Heat Transfer

Based on Table 4. It can be seen that the material integrated with padang ganting hot spring tourism object consists of static fluid material and heat temperature.

## 2. Development or Prototyping Phase (Tahap Perancangan)

### a. Planning

The result of this design stage is to get an overview of the module that will be created from the cover, the beginning of the module, the final part and the contents of the module. For more details can be seen in Figure 2.



**Fig 2.** Product design (a) module start part (b) Module contents section (c) Module end (d) Module cover

### b. Formative Evaluation

#### 1) Self Evaluation

The results of self evaluation have some suggestions that need to be revised, such as on the cover because the color mix used is too contrasting, the font type is still some parts that do not use the font Times New Roman, the contents of electronic module material that there are some concept errors and learning videos that still have too long duration, do not use background so that it is classified as monotonous and has not been explained Edupark intergration in padang ganting hot spring with the material contained in the module.

#### 2) Expert Review

Expert Review results there are several revisions such as on aspects of display feasibility that need to be changed, namely the size of the writing on the book that is considered small so that it is difficult to read, inconsistent image captions and the use of numbering that is considered less because there are still many bullets and lastly inconsistent formula numbering. While in the material aspect in the form of the use of concepts that make learners misconceptions and do not use vector symbols in formulas that are classified into vectors. Finally,

the feasibility aspect of the presentation can be used without revision. After the revision of the suggestions given by experts obtained the results of validation of electronic module products Edupark hot water Padang Ganting valid.

### B. Discussion

In the research of Edupark hot water electronic module Padang Ganting obtained results, namely a valid Padang Ganting hot water Edupark electronic module assessed from four aspects namely aspects of material feasibility, presentation, appearance and language as clearly seen in Figure 3.

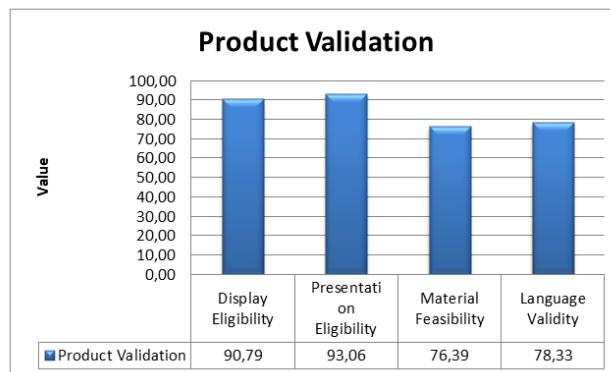


Fig 3. Product Validation Results

Based on Figure 3, it can be known that the resulting product is classified as valid after judging from the validity criteria. The feasibility of display with a value of 90.79 is classified into very valid criteria, the feasibility of presenting with a value of 93.06 is classified into very valid criteria, the feasibility of the material with a value of 76.39 is classified into a valid criteria and the last language feasibility with a value of 78.33 is classified into valid criteria.

The average result of edupark hot water electronic module validation of Padang Ganting from aspect 1) material feasibility 2) feasibility of display 3) feasibility of presentation and 4) validity of language obtained a value of 84.64 which is classified into very valid criteria. So obtained edupark hot water electronic module Padang Ganting that is worthy to be used as a source of learning. The advantages of Edupark hot water electronic module Padang Ganting are the ease of accessing and using this module, then edupark electronic module has a video of learning, experiments that can be done virtually and evaluation can be done online and learners can know directly the value obtained after completing the evaluation not only that the learners can also know in the section where students make mistakes so that students can learn again.

For more details, edupark hot water electronic module that has been completed is improved based on the suggestions given by three experts from physics lecturer in Department of Physics. Edupark electronic modules that are categorized as valid can be seen in Figure 4.



(a)

(b)



(c)



(d)

**Fig 4.** Product Results after validation (a) Module start part (b) Module contents section (c) Module and (d) Module cover

#### IV. CONCLUSION

The characteristics assessed are from aspects of material feasibility, panyajian, appearance and language. Evaluation from experts or validators produces Edupark Hot Water Electronic Module Padang Ganting Assisted Professional Flip PDF Application for senior high school that is valid and can be used as a learning resource.

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