The validity of the science edupark E-Book with a scientific approach based on Padang Beach tourism destinations

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Abstract. Learning science by utilizing tourist destinations can observe objects and phenomena in a more real way. Tourist destinations as a source of learning in the form of educational tours are called edupark. This research aims to produce a valid science edupark e-book. Validity is needed to test a study. The validity tested in product development is a material substance, appearance feasibility, presentation feasibility, and language. The edupark e-book validation was carried out by three experts. The research conducted was Design Research with the type of Development Studies using the Plomp model with the steps of Preliminary Research, self-evaluation, expert review. The research instruments were the validity instrument sheet and the edupark e-book validation sheet. Analysis of the data from the results of the validation by the validator shows that each aspect of validity has met the valid category. This shows that the edupark e-book developed meets validity aspects, namely aspects of material substance, feasibility of appearance, feasibility of presentation, and language. Thus, the edupark e-book developed is valid for use in learning.

1. Introduction
The development of science and technology brings significant changes to various dimensions of human life, be it economic, social, cultural, or educational. It is necessary to make adjustments to learning so that education is not left behind from the development of science and technology. Also, the development of science and technology increasingly encourages renewal efforts in the use of technological results in learning. Learning science (biology, physics, chemistry) has a considerable contribution to technological development, this is because science is the basic science that underlies technological development [1].

In learning activities, there are several components including objectives, teaching materials, assessment, methods, and tools/media. These components do not stand alone but are interconnected and influence one another. The use of teaching materials is an important component of the learning process in the classroom. Therefore, teaching materials must be packaged attractively and be able to influence the student learning process for the better. This is one of the educators' responsibilities to package teaching materials that can attract students' interest in learning activities. In the 2013 curriculum, the role of the teacher in learning activities is not only to convey knowledge but also to play various roles that aim to develop the potential of students optimally.

Teaching materials are needed in the process of learning activities in schools, both teachers and students. The learning process using teaching materials can increase the value of knowledge, skill
values, and attitude values of students [2]. Teaching materials that are often found include handouts, books, modules, brochures, and student worksheets. The book that is the teacher's handbook serves to provide motivation, develop creations, recognize the potential in learning for students [3]. Teaching materials have several important roles in the learning process where the first role is learning that is more interesting, efficient, realistic, and meaningful. Teaching materials make learning simple, practical, effective, and understandable by students. The second role is to develop the knowledge, skills, attitudes, and values of students in the learning process. The third role is to make learning easy, to help memorize things that are needed right. The fourth role is to let teachers and students participate actively and effectively in learning. The fifth role is to improve the competence of learners, save time, increase student interest, and facilitate student memory retention. Another role of teaching materials is to develop self-confidence, self-actualization, and motivation of students in learning [4].

In line with the increasingly rapid development of Information Technology, learning resources must also be able to display interactive simulations by combining video, animation, audio, and images. This combination can help students visualize an abstract learning material so that students can understand the concepts in the material. One alternative learning resource that can be used as a solution to this problem is a digital book (e-book). A digital book or E-book is a publication consisting of text, images, and sound and published in digital form that can be read on computers, or other electronic devices such as androids, or tablets [5]. The use of e-books in learning can visualize abstract material into a visual form that can be animated so that students are more interested [6]. In learning material in science subjects that integrate abstract and concrete concepts.

Along with the development of technology, the 2013 curriculum has also given autonomy to teaching units to develop curricula according to the needs and potential of their respective regions so that educators and students can take advantage of technology in the learning process, thus education will continue to progress and develop. Science learning supports a curriculum development framework that links science with everyday life, environment, and technology [7]. Learning with an environmental approach is one of the solutions to achieve meaningful learning in studying natural sciences, including science. Meaningful learning can be interpreted that in learning students experience an event directly so that the information obtained is stored for a long time in their memory [8]. In essence, environment-based learning brings students closer together with their environment, so that they have a sense of love, care, and responsibility for their environment [9]. Learning in nature can help students understand the concepts of science, including physics, which are related to their environment.

The application of science learning to everyday life can be done by utilizing the environment as a learning resource, one of which is through regional potential in the form of tourist destinations. Tourist destinations as a source of learning in the form of educational tours or also known as edupark. Some eduparks that can be used as learning resources include Padang Beach, West Sumatra [10], National Geopark Ranah Minang Silokek, Indonesia [11], Lembah Anai [12], Seribu Rumah Gadang, South Solok [13], Cerocok Beach, Painan [14], Bukit Cinangkiak, Solok [15], Mifan Padang Panjang, Indonesia [16], Sarasah Kaja Waterfall, West Pasaman [17], Sianok Gorge [18], Janjang Seribu and Gunung Merah Putih, Difficult Air, Indonesia [19], Lembah Harau District of Fifty Cities, Indonesia [20], School Park [21], Semurup Hot Spring, Kerinci [22].

Efforts that can be made to support learning with the 2013 curriculum that directs the development of 21st-century learning by taking advantage of advances in science and technology and scientific approaches referring to regional potential is the replacement of conventional student handbooks into digital books or electronic books (e-books). E-Book is an application program that deserves to be developed to provide a fun learning process by prioritizing the conceptual understanding of students through tourist destinations. E-books are designed in the form of text, images, videos, or animations that can be used to show real situations that are more convincing for students to understand the concept. In implementing learning using e-books, a learning device is needed that supports the
activities in the e-Book. The purpose of this study is to develop an e-Book of science education with a scientific approach based on Padang Beach tourist destinations that meet valid criteria.

2. Method

The research conducted was Design Research with a development studies type. Design research (design research) conducted using the Plomp model. Design research as development studies. In this study, the self-evaluation stage was carried out by researchers, peers, and supervisors then continued with the expert validation stage based on their field of expertise. The data collection instrument for the validity test was in the form of a validated questionnaire to see the feasibility of the resulting product. The e-book validation analysis technique is carried out based on a questionnaire that has been filled in by 3 validator experts in Physics, Media, and Language. The questionnaire was analyzed to determine the level of validity of the product being developed. The validity analysis uses a Likert scale by using the Aiken's V formula, namely:

\[
V = \frac{\sum s}{n(c-1)}
\]  

Information:
- \(s = r - lo\)
- \(lo = \) The lowest number of validity assessments (in this case = 1)
- \(c = \) The highest number of validity assessments (in this case = 4)
- \(r = \) Number given by the validator

The validity category of the developed science edupark e-book can be seen in Table 1.

| No | Score | Criteria |
|----|-------|----------|
| 1  | ≥ 0,6 | Valid    |
| 2  | < 0,6 | Invalid  |

3. Research Result

The e-book product being developed is in the form of a science edupark e-book in the form of non-printed teaching materials made with the help of the Microsoft Word program then converted to PDF and combined into the 3DFlipBook application. In the e-book, there is an e-book skin, foreword, table of contents, table list, list of pictures, instructions for use, information related to edupark / Padang Beach tourist destinations, material coverage that is integrated directly with edupark, a material developed by presenting integrated science material directly with tourist destinations and activities carried out at edupark, sample questions and exercises, glossary, bibliography, and information about the author, as shown in Figure 1.
Expert validation was carried out after revising the e-book based on the input and suggestions generated in the self-evaluation. Validation is done by providing validation sheets to three lecturers (experts). Expert validators for content aspects are considered based on expertise in physics. Then, expert validators for the feasibility aspects of presentation and appearance feasibility based on experts who are experienced in teaching instructional media. Then, expert validators for linguistic aspects by Indonesian language experts. The validation instrument that will be used to validate the e-book must be assessed in advance to determine the validity level of the instrument. The assessment of the instrument was carried out by filling out an assessment sheet in the form of a questionnaire by three experts. The results of the validity instrument validation are in Table 2.

| No | Validator          | Average Validity | Category |
|----|-------------------|------------------|----------|
| 1  | US (physics and media) | 0.89             | Valid    |
| 2  | RW (physics)      |                  |          |
| 3  | AB (languages)    |                  |          |

The results of e-book validation are given by the validator based on the material substance components, appearance feasibility, presentation feasibility, and language. The results of the validation of the science edupark e-book are as follows:

3.1. Substance Material

The e-book validation component of the material substance consists of 43 points of assessment which are divided into 3 validated aspects, namely: (a) The accuracy of the material, in this aspect several indicators are assessed, namely the truth and depth of the material regarding facts, conceptual...
principles and procedures according to the topic of the material. In terms of accuracy, the material consists of 32 aspects; (b) The characteristics of the scientific approach, this aspect 5 aspects are assessed regarding the suitability of the scientific approach steps to the material; (c) Supporting learning materials, in this aspect, there are several components regarding the material presented including up to date and innovative current information. In the supporting aspects of the learning material, there are 6 aspects assessed regarding illustrations, images, and videos that are relevant to the topic in the material. The value of the analysis of the material substance is 0.85 with the valid category.

3.2. Presentation Feasibility
The e-book validation component of the presentation feasibility consists of 23 assessment items divided into 4 validated aspects, namely: (a) The title of the e-book, in this aspect there are several points of assessment regarding the suitability of the e-book title with the material, the font in the title and the color is constructive. In the aspect of the e-book title, there are 5 points of assessment; (b) Suitability of material with KI and KD, there are 5 points of assessment regarding the suitability of the material presented with Core Competencies and Basic Competencies; (c) Presentation Support, in this aspect, there are 6 points of assessment regarding presentation support in the form of sample questions, practice questions, compiler identities, and references that can help strengthen understanding of the concepts contained in the material; (d) Completeness of Presentation, in the aspect of completeness of presentation, there are 7 points of assessment regarding the presentation of e-books, there are prakarta, instructions for use, table of contents, list of figures, list of tables, bibliography, and glossary. The value of the analysis result of the presentation feasibility component is 0.86 with the valid category.

3.3. Display Feasibility
The e-book validation component of the appearance feasibility consists of 15 points of assessment which are divided into 2 validated aspects, namely: (a) e-book cover design, on the e-book cover design aspect there are 3 points of assessment regarding proportional unity of placement of elements of governance. location, color, and font. The covers are designed according to the edupark, namely in the form of Padang Beach; (b) The e-book content design, there are 12 points of assessment regarding the e-book content design which are adjusted to the content material based on the topic in the e-book and its relationship with the Padang beach edupark. The value of the analysis result of the display feasibility component is 0.91 with the valid category.

3.4. Language
The language component e-book validation consists of 10 grading items which are divided into 4 validated aspects, namely: (a) Accuracy in the Use of Language Rules, there are 4 points of assessment regarding the words and sentences used to convey the concept referring to Indonesian language rules, spelling used refers to the General Guidelines for Indonesian Spelling, the use of terms that describe a concept, principle, principle, or the like must be precise and consistent; (b) The use of terms, symbols or icons, there are 2 points of assessment regarding the use of terms, symbols and icons that describe a concept that must be consistent between parts in the e-book; (c) Sequence and flow of thought, there are 2 points of assessment regarding the delivery of concepts between one chapter and another adjacent and between sub-chapters in the chapter reflects a logical relationship; (d) In accordance with the level of development of students, there are 2 points of assessment regarding the use of language to explain concepts or illustrations to examples in accordance with the intellectual level and development of students. The value of the results of the linguistic component analysis was 0.73 with the valid category. The results of the validation analysis of the science edupark e-book for each validator can be seen in Table 3.
Table 3. Results of the Edupark Science E-book Validation

| No | Components Validation     | Validator Value | Average | Category |
|----|----------------------------|-----------------|---------|----------|
| 1  | Substance of Matter        | 0.91 0.75 0.91  | 0.85    | Valid    |
| 2  | Serving Feasibility        | 0.75 0.97 0.95  | 0.86    | Valid    |
| 3  | Appearance Feasibility     | 0.97 0.88 0.95  | 0.91    | Valid    |
| 4  | Language                   | 0.82 0.75 0.82  | 0.73    | Valid    |

Table 3 shows the results of expert validation that have been carried out, it can be concluded that the science edupark e-book with a scientific approach based on Padang Beach tourist destinations is in the valid category. This is evidenced by the value of each component. The e-book developed has met the indicators developed in the e-book validation.

4. Discussion
The validity that is tested in product development is the validity of the material substance, the feasibility of appearance, the feasibility of presentation, and language. A product is said to meet the validity of the material substance by the material demands on the curriculum and its relationship with Padang Beach tourist destinations. The validity of the material substance component includes indicators, (1) Truth and depth as seen from the accuracy of the material in the form of facts, concepts, principles, and procedures. The characteristics of the scientific approach are in the form of scientific steps to observe, ask, try, reason, and communicate; (2) Present as seen from supporting learning material.

Indicators on the accuracy of the material meet the valid criteria because the material presented in the science edupark e-book is presented accurately to avoid student misconceptions. Concepts and definitions are formulated to support the achievement of KI and KD. The concept has been linked directly with Padang Beach tourist destinations, one of which is the science concept in surfing which has science concepts such as waves, friction, gravity, buoyancy, and balance.

The material contained in the science edupark e-book is following science facts, concepts, principles, and procedures which are part of the essence of science as the most important component in the science learning process. One of the facts of science in the e-book Edupark can be seen from someone who is playing surfing where that person can play surfing because of the concept of science such as transverse waves, longitudinal waves, equilibrium, friction, and gravity. Then the science concept contained in the edupark e-book includes a structured explanation of science materials, one of which is about transverse waves, longitudinal waves, equilibrium, frictional forces, and gravitational forces. The principles of science in the e-book edupark can be seen from the principles of Archimedes in the chapter on Science Concepts in Surfing. Furthermore, the science procedure contained in the edupark e-book includes experiments conducted by students to understand science material. The experiment is directly related to Padang Beach tourist destinations.

The accuracy of the material is by the scientific approach activities, the use of the scientific approach in teaching materials can improve the abilities of students [24]. The scientific approach to the edupark e-book includes observations of Padang Beach through videos and pictures. The videos and images displayed in the edupark e-book can make it easier for students to find information related to Padang beach in finding the science concept. The existence of audio, video, images, animation, and other multimedia can make it easier for students in the learning process [25]. Besides, the science edupark e-book provides an opportunity for students to answer the questions observed in the edupark e-book. Learning by connecting the environment, students gain understanding and competence by observing and doing directly what is and is happening around [26].

The scientific approach to the Edupark e-book contains experiments because the learning process requires students to carry out several experimental procedures. This experiment was carried out so that students could find and understand existing concepts. Experiments were carried out using a scientific approach with the following steps: Observing, Asking, Trying, Reasoning, and Communicating.
Furthermore, in the edupark e-book that was tried, it was directly related to tourist destinations so that students not only remember and understand the concept but also apply the concept to real life. The step of reasoning in a scientific approach can increase understanding of scientific knowledge and its application. Learning using learning facilities in the surrounding natural environment as a learning resource for students can develop and preserve natural resources and improve the quality of human resources [27].

The validity of the supporting indicators for learning material meets the valid criteria because the illustrations, pictures, and videos in the Edupark e-book are relevant to everyday life. Material that is integrated with Padang beach tourism destinations is equipped with application examples based on real conditions and can bring new things and according to the development of science. States that using a combination of text, images, and animation in learning will make it easier for students to learn the content being studied [28].

A product is said to meet the validity of presentation feasibility if each component of the presentation feasibility is directly related to the Padang Beach tourist destination. The validity indicators of presentation feasibility include the suitability of the e-book title, the suitability of the material with KI and KD, supporting presentation, and presentation completeness. The feasibility of presenting the science edupark e-book has met the criteria of an e-book suitable for use by the Education Unit because it already has an initial section covering the front cover, French pages, introduction, table of contents, list of pictures, list of tables, instructions for use and introduction. Then it has a content section including sub-chapter titles, KD, scientific approach, material content exposure, sample questions, and practice questions. Furthermore, the edupark e-book already has a final section consisting of a glossary, author's identity, and bibliography.

The validity of the display eligibility components has met the valid criteria if the components are consistent with one another. The display eligibility component indicators include (1) e-book cover design, including consistency in the layout and clarity of color on the front and back covers; (2) The content design of the e-book, contains a color and font composition suitable for the entire content of the edupark e-book, a proportional design layout, as well as videos and images that can function clearly and following the context of the material.

The validity of the linguistic component meets the valid criteria with the use of language, terms, and symbols following PUEBI (General Guidelines for Indonesian Spelling). The delivery of material in the edupark e-book is continuous between the sentences in the paragraphs and the material between sub-chapters reflecting the relevance of the content, as well as the language used in the edupark e-book according to the level of development of students. The edupark e-book validation was carried out by three experts. Analysis of the data from the results of the validation by the validator shows that each aspect of validity has met the valid category. This shows that the edupark e-book developed fulfills validity aspects, namely aspects of material substance, appearance feasibility, presentation feasibility, and language.

5. Conclusion
The e-book developed has met the indicators developed in the e-book validation. This is evidenced from the value of each component with the results of the material substance analysis 0.85 valid category, 0.86 presentation feasibility component with valid category, display feasibility component 0.91 with valid category, and 0.73 language component with a valid category. Thus, the science edupark e-book with a scientific approach based on the Padang Beach tourist destination that was developed meets valid criteria for all aspects of the e-book edupark feasibility (material substance, presentation feasibility, appearance feasibility, and language) according to expert reviews.

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