



Development Learning Media E-Book Based on TPACK on Natural Science Education in Elementary School

Selsa Ramdhanita Putri¹, Herlina Usman², Juhana Sakmal³

¹Elementary Education, Universitas Negeri Jakarta, Indonesia

Email: selsa.ramdhanita.putri@gmail.com

²English language education, Universitas Negeri Jakarta, Indonesia

Email: herlina@unj.ac.id,

³Elementary Education, Universitas Negeri Jakarta, Indonesia

Email: jsakmal@unj.ac.id

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Abstract. Development research aims to instill the character value of responsibility in students during this pandemic, this is one of the backgrounds for the development of this Digital Picture Storybook. In addition, the problem that is often faced is the limited learning media available to instill the character of responsibility in children. The purpose of this study was to 1) find out the steps for developing digital picture story books to increase the character of responsibility, 2) find out the feasibility of digital picture story book media to improve the character of responsibility in 3rd grade elementary school students. This research and development model adopts the 4D theory (four-D model). The steps for developing digital illustrated storybooks that have been carried out are the Define, Design, and Develop stages. The method used is Research & Development, the model developed using; Analyze, Design, Develop, Implement, and Evaluation (ADDIE). The steps in this research stage, 1) analyzing research needs, 2) product design, 3) developing products, 4) student trials, and 5) evaluation. Data analysis techniques using interviews, and questionnaires.

Abstrak. Penelitian ini bertujuan untuk menghasilkan buku elektronik berbasis TPACK pada pelajaran Ilmu Pengetahuan Alam. Metode yang digunakan Research & Development, model yang dikembangkan menggunakan; Analyze, Design, Develop, Implementation, dan Evaluation (ADDIE). Langkah-langkah dalam tahapan penelitian ini, 1) menganalisis kebutuhan penelitian, 2) perancangan produk, 3) mengembangkan produk, 4) uji coba peserta didik, dan 5) evaluasi. Teknik analisis data menggunakan wawancara, dan kuesioner. Subjek yang akan peneliti gunakan dalam penelitian ini sebanyak tiga subjek yang merupakan siswa kelas lima sekolah dasar. Hasil uji coba pengembangan dievaluasi oleh ahli media, ahli materi, dan ahli bahasa yang diperoleh dari nilai rata-rata sebesar 85.50% dengan kategori sangat baik, sedangkan hasil uji coba pengguna secara online menghasilkan nilai rata-rata 80.75%. Ini menunjukkan bahwa Buku Digital layak digunakan untuk pembelajaran Ilmu Pengetahuan Alam di kelas lima sekolah dasar.

Keywords:

Development
Learning;
Media E-Book;
Natural Science;
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Corresponden author:**Selsa Ramdhanita Putri**

Jalan: Jl. R.Mangun Muka Raya Kota Jakarta Timur, Daerah
 Khusus Ibukota Jakarta 13220,
 Email: selsa.ramdhanita.putri@gmail.com



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INTRODUCTION

Researchers will conduct research on the development of e-books. Because in the learning process components are needed so that learning activities take place properly and directed, one of which is the existence of media that can be used as learning guidelines for both students and teachers. One of the student learning media that implements technology and communication developments with user interaction that is currently being developed is digital books or known as e-books (Mentari et al., 2018). The use of e-books can increase the interaction between educators and students in distance learning and students are more interested in using e-books in learning (Lestari et al., 2016). Media must make it easier for students to learn outside of school that implements technological developments and communication with user interaction which is currently being developed, namely digital books or known as e-books. E-books play an important role in the learning process because they have advantages. Some of the functions of E-books as learning media are to increase learning productivity. E-book as an unlimited reference, so it is not fixated on one learning resource. Ebooks are very easy to carry in many files, so educators don't run out of learning materials for students.

Technological pedagogical content knowledge (TPACK) is a new type of knowledge that must be mastered by teachers to be able to integrate technology well in learning (Rahmadi, 2019). Professional teachers must have adequate TPACK competencies because TPACK is in the realm of the four main competencies of a teacher which include pedagogic competence, personality competence, social competence and professional competence (Suyamto et al., 2020). TPACK is formed from a combination of 3 types of basic knowledge, namely

Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK). The results of the combination of these 3 basic knowledges produce 4 new knowledges, including Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK). The following is an explanation of each TPACK knowledge domain extracted from Mishra & Koehler (2006 & 2008), Koehler & Mishra (2009) and Koehler, Mishra, & Cain (2013). Technological knowledge (TK) is knowledge about various types of technology as tools, processes, and resources. Pedagogical knowledge (PK) or pedagogic knowledge is knowledge of theory and practice in planning, process, and evaluation of learning. Content knowledge (CK) or content knowledge is knowledge about content or subject matter that must be studied by teachers and taught to students. Technological content knowledge (TCK) or content technology knowledge is knowledge about the interrelationships between technology and content. Technological pedagogical knowledge (TPK) is knowledge about various technologies that can be used to facilitate learning and learning. Technological Pedagogical Content Knowledge (TPACK) or pedagogical technology knowledge and content is knowledge about the use of appropriate technology in appropriate pedagogics to teach a content well. These seven knowledges need to be mastered by future teacher candidates who will teach in a learning environment filled with various technological instruments. So that teachers can use the right technology in appropriate pedagogics for specific content well.

Seeing the urgency of learning media that is so great in the process of sustainable learning in the classroom, learning media must

be packaged in an attractive form. This statement is in line with Herlina's opinion which says that learning media must be packaged properly in the teaching and learning process in order to attract the interest of students (Herlina & Dewi, 2017). Learning media is something that can convey a message, stimulate the thoughts, feelings, and willingness of students to encourage the learning process (H Usman, 2019). Teachers can use learning media that are relevant to the needs of students in order to achieve learning objectives. Of the many learning tools, one alternative that can be used in the learning process of third grade elementary school students is digital books. According to Sella Mawarni, E-Book stands for electronic book is a book without paper, where e-books are easily accessed through a Personal Digital Assistant (PDA) or a special pocket created by information technology companies. A digital book is a content collaboration between modules, digital devices, and the use of various types of supporting media that add to the power of interactivity (Sella Mawarni, 2017).

As a follow-up to the problems that occurred and supported by previous research, the researchers decided to find a solution by developing a learning device in the form of a Digital Book with Indonesian language subjects with TPACK-based characteristics for fifth-grade elementary school levels. This digital book is expected to be a useful and innovative product, especially for teaching and learning Indonesian in fifth-grade elementary schools.

METHOD

The research method describes: approach, scope or object, operational definition of variable/description of research focus, place, population and sample/informant, main materials and tools, data collection techniques, and data analysis techniques. The purpose of this development research is to produce an electronic book based on TPACK for fifth grade elementary school students in the subject of Natural Sciences theme 8 The Environment of Our Friends, subtheme 1 Humans and the Environment. The study was conducted on fifth grade students at SDN Cengkareng Barat 16 Pagi, West Jakarta from March to June 2021.

The selection of this model was based on the consideration that this model was developed systematically and based on the theoretical foundation of learning design (Tegeh, I Made; Jampel, 2015). This model is structured programmatically with systematic sequences of activities in an effort to solve learning problems related to learning resources that are in accordance with the needs and characteristics of learners. In the research procedure using Research & Development with the ADDIE model. There are five steps in the ADDIE development model, namely: 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation.

At the analysis stage, the researcher conducted interviews and distributed questionnaires to collect information through needs analysis and literature study. Based on the results of the needs analysis, several things were found, namely 1) SDN Cengkareng Barat 16 Pagi did not use electronic books in learning; 2) the physical condition of some thematic books or student books is not good; 3) already available pictures in thematic books or student books; 4) too many materials and questions in thematic books or student books; and 4) students are less able to memorize the material so that it makes students not enthusiastic in learning. Furthermore, at the design stage, the researcher made a design by making a storyboard of an electronic book based on TPACK. At the development stage at this stage, researchers began to develop TPACK-based electronic books which were still limited to storyboards into ready-to-use products. The initial design has been completed and will then go to the validation process by media experts, material experts and linguists to determine the level of feasibility of using the assessment instrument. In the implementation phase, the product was tested on fifth grade elementary school students and teachers after improvements were made. The last stage, namely evaluation, the researchers conducted a one-to-one trial consisting of 3 students and a small group consisting of 6 grade 3 students at SDN Cengkareng Barat 16 Pagi and also a class V teacher in order to respond to the use of the product. The data analysis technique used to perform data analysis is quantitative descriptive statistics. The assessment uses a rating scale, namely the raw data obtained in the form of numbers and then interpreted in a qualitative sense. The

assessment uses a rating scale, a scale of 5 consisting of 1 for Very Good, 2 for Good, 3 for Enough (C), 4 for Poor (B), and 5 for Very Poor. The rating scale used as a guide in interpreting eligibility is described in table 1.

Table 1. Rating scale

No	Persentase	Category
1	81%-100%	Very good
2	61%-80%	Good
3	41%-60%	Enough
4	21%-40%	Poor
5	0%-20%	Very poor

RESULT AND DISCUSSION

The research results are presented completely and according to the scope of the research. Research results can be supplemented with tables, graphs (pictures), and/or charts. Tables and figures are numbered and titled. The results of data analysis are interpreted correctly. This development research uses the ADDIE model which consists of 5 stages. The stages consist of analyzing research needs, designing products and compiling instruments, product actualization and expert validation, student trials, and evaluation. Product development is carried out in March – June 2021.

The results of interviews and questionnaires conducted with classroom teachers and students found that the Indonesian language learning process in the classroom used thematic books or student books. However, the student's book has material substance which shows that there is too much text that must be used without using illustrations that better describe the material. This condition becomes ineffective because it takes a long time to memorize, and students do not have a deep impression on Indonesian lessons because once they are memorized, they are easily forgotten. In addition, there are too many collections of questions that force students to work thoroughly. Such conditions result in students not being able to meaningfully instill the values taught through Indonesian language subjects.

CONCLUSION AND SUGGESTION

Development of TPACK-based Digital Books on Observing Sentence Vocabulary for learning Indonesian in third grade using the

ADDIE research stage There are five steps in the ADDIE development model, namely: 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation. TPACK-based Digital Books are suitable for use in learning based on the assessments of the three experts and also the assessments of students. The score obtained for TPACK-based Digital Books from media experts is 80%, from material experts 75%, and scores from linguists 80%. With these three scores, the TPACK-based Digital Book is categorized as very good even though there are revisions. In addition to expert tests, tests were also carried out by students to assess the products developed. The assessment by students is carried out in two stages, namely the one-to-one test and the small group test. The one-to-one test got a score of 85% and the small group test got a score of 81%. With this score, the product is categorized as very good. Based on the results of the recapitulation of expert validation assessments and product trials to students, the researchers can find out that TPACK-based Digital Books are suitable for use in learning Indonesian with the material Observing Sentence Vocabulary.

REFERENCES

- Lestari, R. T., Adi, E. P., & Soepriyanto, Y. (2016). Ebook Media Pembelajaran Interaktif. *E - ISSN: 2615-8787 E-BOOK*, 71–76.
<http://journal2.um.ac.id/index.php/jkt/article/view/3529/2184>
- Mentari, D., Sumpono, S., & Ruyani, A. (2018). Pengembangan media pembelajaran e-book berdasarkan hasil riset elektroforesis 2-d untuk mengukur kemampuan berpikir kreatif mahasiswa. *PENDIPA Journal of Science Education*, 2(2), 131–134.
<https://doi.org/10.33369/pendipa.2.2.131-134>
- Rahmadi, I. F. (2019). Technological Pedagogical Content Knowledge (TPACK): Kerangka Pengetahuan Guru Abad 21. *Jurnal Pendidikan Kewarganegaraan*, 6(1), 65.
<https://doi.org/10.32493/jpkn.v6i1.y2019.p65-74>
- Suyamto, J., Masykuri, M., & Sarwanto, S.

(2020). Analisis Kemampuan Tpack (Technolgical, Pedagogical, and Content, Knowledge) Guru Biologi Sma Dalam Menyusun Perangkat Pembelajaran Materi Sistem Peredaran Darah. *INKUIRI: Jurnal Pendidikan IPA*, 9(1), 46. <https://doi.org/10.20961/inkuiri.v9i1.41381>

Tegeh, I Made; Jampel, I. N. P. T. (2015). Pengembangan Buku Ajar Model Penelitian Pengembangan Dengan Model Addie. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 3(1), 24–29.