JPPIPA 11(8) (2025)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

Development of Interactive E-Book Based on Book Creator to Improve Creativity of Vocational High School Students

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Received: June 25, 2025
Revised: July 23, 2025
Accepted: August 27, 2025
Published: August 31, 2025

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DOI: 10.29303/jppipa.v11i8.11883

Abstract: This study was conducted at SMKN to address the lack of media variation in vocational education and to improve student creativity, especially in the Computer and Network Engineering (TKJ) major. The objective was to develop an interactive e-book based on Book Creator and examine its development process and effectiveness. The research used the ADDIE model (Analyze, Design, Develop, Implement, Evaluate) within the R&D framework. Instruments included expert validation sheets, student response questionnaires, pretests, posttests, and observation forms. The developed media presented learning content with interactive features such as text, audio, video, animations, and quizzes. Results showed that media validation scored 92%, material 91.01%, student response 97.9%, and pretest-posttest instrument validity over 90%. The e-book effectively increased students' creativity: fluency improved from 62.1 to 83.4 (N-Gain 0.56), originality from 58.9 to 81.7 (N-Gain 0.53), flexibility from 60.5 to 85.0 (N-Gain 0.61), and elaboration from 64.0 to 84.5 (N-Gain 0.58). The overall N-Gain score was 0.58 (medium category). A paired t-test ($p = 0.000 < 0.05$) confirmed significant improvement. Student and teacher responses also indicated the media was enjoyable, easy to use, and facilitated concept understanding. In conclusion, the Book Creator-based interactive e-book is valid, practical, and effective in fostering creativity among vocational students and supports 21st-century learning.

Keywords: ADDIE model; Book creator; Creativity; Interactive e-book

Introduction

A common issue encountered in the teaching and learning process in vocational high schools, especially in the Computer and Network Engineering (TKJ) department, is the limited variety of learning media that suit students' needs and learning styles (Har et al., 2020). Innovative learning media such as interactive e-books have become a potential solution to support more engaging and effective teaching and learning activities (Roemintoyo & Budiarto, 2021).

The development of creativity is an important aspect of vocational education (Anam, 2021). Creative students tend to be better prepared to deal with technical problems in the workplace, are able to design new solutions, and are more adaptable to rapid technological developments (H et al., 2021). Therefore, learning should not be solely focused on cognitive aspects (Sutarto, 2017) but should also be designed to foster growth in affective and psychomotor aspects, particularly those related to students' creative abilities (Lestari, 2019).

With the development of digital technology and the need for 21st-century skills-based learning, e-module or e-book-based media with an interactive approach has become very relevant (Asrowi et al., 2019), Learning approaches such as inquiry learning are also increasingly being used because they can encourage students to explore and gain a deeper understanding of the material (Sari & Manuaba, 2021). Unlike ordinary digital books, interactive e-books enable the presentation of material accompanied by multimedia such as moving images, audio, video, animation, and even quizzes or exercises that respond directly. These features make the learning process more enjoyable,

How to Cite:
Handoko, H. E., Triwahyuni, E., & Kustiyowati, K. (2025). Development of Interactive E-Book Based on Book Creator to Improve Creativity of Vocational High School Students. *Jurnal Penelitian Pendidikan IPA*, *11*(8), 928–934. https://doi.org/10.29303/jppipa.v11i8.11883

encourage active student engagement, and stimulate their creativity (Hakim, 2021).

One platform that supports the practical and efficient development of interactive e-books is Book Creator. This application allows teachers and students to create digital books with attractive displays and customizable multimedia content. With its user-friendly interface and collaborative features, Book Creator can be used to foster important 21st-century skills, such as critical thinking, communication, and teamwork (Hamna & BK, 2022). Previous research shows that digital learning media such as interactive e-books can improve students' mastery of concepts in science learning. Harjono et al. (2020) developed interactive e-books on physics material equipped with multimedia features such as video, audio, and animation. The results showed a significant increase in students' mastery of concepts and overall learning activities, especially in the cognitive domains of understanding, applying, and analyzing.

On the other hand, students' psychological factors also play an important role in learning effectiveness. Mustakim et al. (2020) examined the relationship between emotional intelligence and science learning outcomes of elementary school students. Although the results of this study showed no significant relationship, it emphasized the need for a more adaptive learning approach, particularly in stimulating positive emotions and learning motivation in students through more interesting and interactive media.

Against this backdrop, this study focuses on the development of an interactive e-book based on Book Creator, tailored to the characteristics and needs of students in the TKJ program at SMKN 1 Banyuanyar. This e-book is expected to serve as an engaging, interactive, and easy-to-understand learning medium that supports the enhancement of students' creativity. Cognitively, creativity is defined as the ability to think with fluency, flexibility, originality, and elaboration. Meanwhile, from an affective perspective (Anas & Sartika, 2021), creativity is characterized by strong motivation, curiosity, interest in complex tasks, courage to take risks, resilience, and appreciation for oneself and others (Rudini & Khasanah, 2023).

The development of this media will refer to the ADDIE instructional development model. The ADDIE model is widely used in the development of digital learning media because of its systematic and flexible advantages (Rahayu & Sukardi, 2020). The ADDIE approach was chosen so that the final product can be systematically tested in terms of content, visual appearance, level of interactivity, and effectiveness in supporting learning objectives, particularly in terms of developing students' creativity (Mulyatiningsih, 2015).

Method

This study uses the Research and Development (R&D) method with the ADDIE development model. According to Branch (2009) the ADDIE development model consists of five stages: analysis, design, development, implementation, and evaluation (Rachma et al., 2023). This model is widely used in the development of learning products because it is systematic and flexible (Analysis, Design, Development, Implementation, Evaluation). The subjects were students in class XI TKJ-I, and the study was conducted in class XI TKJ-1 at SMKN I Banyanyar. Jl. Klenang Lor No. 100, Banyuanyar Subdistrict, Probolinggo Regency, East Java.

The instruments used in this study included: Questionnaire: Used to measure students' creativity before the treatment (Sugiyono, 2021). The questionnaire was developed based on creativity indicators. Observation sheet: Used to observe students' activities during learning using Book Creator. Summative assessment sheet: Used to determine the increase in students' creativity after using the media (Rusmayana, 2021). Students' creativity was analyzed based on validity and reliability (Batubara, 2020) using descriptive and inferential statistics by calculating the average data obtained from the observation sheet and final assessment of the material and simple tests, n-gain that was significant.

Result and Discussion

Results

Interactive E-Book Display

The development of interactive e-books using Book Creator produces (Nurlaila et al., 2025; Prastyana et al., 2023) learning modules consisting of text, images, audio, video, and exercises. The following image shows the module display.

Figure 1. Book creator home screen

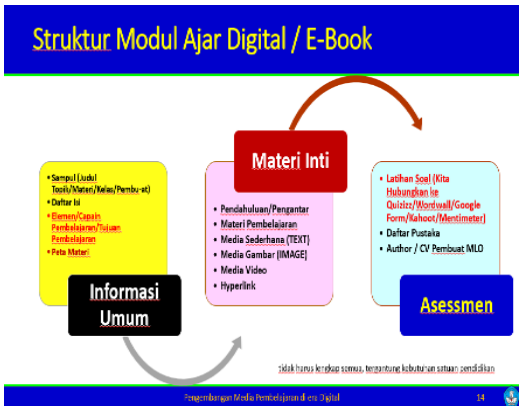

Figure 2. E-book content structure

Figure 3. E-book creator home screen

Figure 4. E-book creator content display

Figure 5. Video display

Figure 6. Audio display

Figure 7. Quizz display and ending

Student Creativity Assessment Results

Measurements were taken before and after treatment using questionnaires and summative assessments based on four indicators of creativity (Torrance, 1974): fluency, originality, flexibility, and elaboration.

Tabel 1. Average student creativity scores before and after treatment

Creativity Indicators	Score Before	Score After	N-Gain	Category
Fluency	62.1	83.4	0.56	Medium
Authenticity	58.9	81.7	0.53	Medium
Flexibility	60.5	85.0	0.61	Medium
Elaboration	64.0	84.5	0.58	Medium
Total Average	61.4	83.7	0.58	Medium

Interpretation of N-Gain based on Hake (1998):
High: > 0.7
Medium: 0.3–0.7
Low: < 0.3

That there was a significant increase in scores after using the interactive The results of the analysis of the

four creativity indicators show e-book based on Book Creator. The fluency indicator increased from 62.1 to 83.4 with an N-Gain of 0.56; originality from 58.9 to 81.7 (N-Gain 0.53); flexibility from 60.5 to 85.0 (N-Gain 0.61); and elaboration from 64.0 to 84.5 (N-Gain 0.58). All N-Gain values fall into the moderate category, with the overall average score increasing from 61.4 to 83.7 and a total N-Gain of 0.58. (Juliana & Sulistyowati, 2023). This indicates that interactive e-books are effective in enhancing students' creativity across all aspects, particularly in terms of flexibility of thinking and idea development.

The following graph shows the average increase in students' creativity scores before and after using the interactive e-book based on Book Creator.

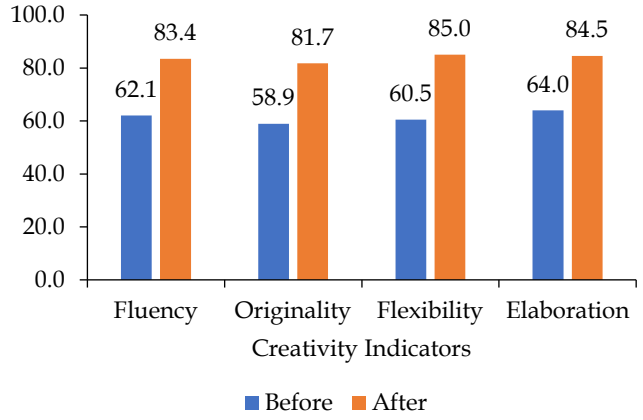

Figure 8. Graph showing the increase in the average creativity score of students

Distribution of Creativity Enhancement

Of the 30 students, 27 students (90%) showed an increase in creativity, 2 students (6.7%) showed a slight increase, and 1 student (3.3%) did not show a significant increase. These data indicate that most students experienced development in the aspects of creativity, courage to try, and flexibility of thinking (Anggraeni & Sari, 2024).

Significance Test

Table 2. Significance test results

Statistical Test	t-value	Sig. (2-tailed)	Conclusion
Paired t-test	5.82	0.000	Significant ($p < 0.05$)

The test results show that the use of interactive e-books statistically significantly improves student creativity.

Student and Teacher Responses

90% of students stated that this media was easy to use and enjoyable, and 85% of teachers stated that this media helped learning and accelerated concept understanding (Nisa et al., 2024).

Discussion

The development of interactive e-book-based learning media using the Book Creator platform in the Network System Administration (ASJ) subject in class XI TKJ-I SMKN I Banyuanyar has a significant impact on student creativity. Based on the analysis results, 90% of students showed an increase in creativity after using this learning media, with an average N-Gain value of 0.58 in the moderate category. This improvement is relevant and consistent with previous findings that technology-based and multimedia learning can make students more interested and more creative in solving learning problems (Rahim, 2022).

Before using interactive e-books, learning was more monotonous and relied solely on textbooks and static presentations as learning resources. This situation caused students to be less motivated and tend to be passive in class. However, after using interactive e-books based on Book Creator, students appeared more enthusiastic and actively participated, both in theoretical learning and practical work. This is further supported by improved scores across all creativity indicators, such as flexibility, fluency, originality, and elaboration. These findings align with previous research indicating that the use of interactive multimedia in e-books can facilitate more engaging and challenging learning (Palupi et al., 2022; Hamna & BK, 2022). The development of this e-book followed the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The product development process was carried out systematically and involved media and content experts to ensure validity and feasibility. The results of the expert validation of content and media showed that this interactive e-book is highly suitable for use (validity score above 80%). This aligns with previous research indicating that technology-based learning products must meet aspects of validity, practicality, and effectiveness to positively impact student learning outcomes (Kurtis & Irfan, 2024; Novaliendry et al., 2021).

In addition to its validity, the practicality of e-books was also tested using student and teacher response questionnaires. 90% of student respondents and 85% of teacher respondents agreed that the e-book is easy to use, engaging, and aligned with learning needs (Rahmaningtyas & Santoso, 2020; Wikipedia Contributors, 2021). With interactive features such as videos, audio, and direct practice exercises, students can not only read but also interact and conduct self-assessments. This response aligns with the increase in student motivation and active participation observed in the classroom. These results support the claim that

interactive features in e-books make learning more engaging and reduce student boredom (Fojtik, 2015).

In terms of effectiveness, test results and statistical analysis show that students are better able to understand computer network concepts and are more confident during practical work. The t-test results show a significance value of 0.000 < 0.05, which means there is a significant difference between before and after the use of media. In other words, e-book-based learning is able to develop students' critical and creative thinking. As stated by Nuralan (2022) e-book-based learning has proven to be effective and capable of supporting improvements in students' learning outcomes at SMK Negeri 1 Kediri.

The application of interactive e-books is supported by the theory of multimodal learning, which states that presenting material in visual, audio, and text formats makes learning more meaningful and strengthens concept mastery (Mayer, 2009). In addition, the active learning approach is in line with the principles of 21st-century learning, which emphasizes critical thinking, communication, collaboration, and creativity skills.

Other studies also show that interactive e-books enable students to learn more independently and collaboratively. Sanjaya et al. (2023) reported that the use of Android-based interactive learning media at SMK Negeri 4 Payakumbuh effectively improved student learning outcomes and made learning more interesting and meaningful. These findings reinforce the relevance of using learning technologies such as Book Creator in vocational schools to address learning challenges in the digital age.

Although the use of Book Creator e-books has proven to be effective and practical, there are challenges in its implementation. One of the obstacles is the need for adequate devices and internet networks to support this technology-based learning (Sastra et al., 2023). In addition, teachers need training to be able to design and develop e-books according to students' needs. With the availability of training in developing learning media using Book Creator, teachers are expected to be able to maximize its features and create more innovative.

The development of e-books must also take into account the need for differentiation and inclusion in order to reach students with diverse backgrounds and abilities. With Book Creator features such as voice text and video, students with special needs can also receive more inclusive and equitable learning (Puspitasari et al., 2020).

Conclusion

The development of an interactive e-book based on Book Creator significantly improved student creativity in SMK. The N-Gain analysis indicated a medium improvement across all four creativity indicators, and statistical testing confirmed the effect was significant. N-Gain values fall into the moderate category, with the overall average score increasing from 61.4 to 83.7 and a total N-Gain of 0.58. These findings suggest that the Book Creator e-book is a valid, practical, and effective medium for enhancing vocational students' creativity in learning environments that integrate multimedia and student interaction. The development of this e-book followed the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The product development process was carried out systematically and involved media and content experts to ensure validity and feasibility. The results of the expert validation of content and media showed that this interactive e-book is highly suitable for use (validity score above 80%). This aligns with previous research indicating that technology-based learning products must meet aspects of validity, practicality, and effectiveness to positively impact student learning outcomes.

Acknowledgments

The authors would like to express their gratitude to SMKN 1 Banyuanyar for facilitating the research and to all students who participated in the study. Appreciation is also extended to the material and media experts for their valuable input during the validation process. This research received no external funding.

Author Contributions

Conceptualization, H.E.H. and E.T.; methodology, software, formal analysis, investigation, resources, data curation, writing—original draft preparation, visualization, project administration, H.E.H.; validation, H.E.H., E.T., and K.; writing—review and editing, supervision, E.T. funding acquisition, none. All authors have read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflict of interest.

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