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Designing Digital Learning Media with Canva and Project-Based Learning to Enhance IPAS Instruction

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Abstract

Background: Student learning outcomes in the topic of Energy and Its Transformations remain consistently low in Indonesian vocational high schools. One of the key challenges is the predominant use of conventional teaching methods and the minimal use of engaging digital tools. This results in low student participation and limited conceptual understanding.
Aims: This study aimed to develop and evaluate interactive learning media using Canva, integrated with the Project-Based Learning (PjBL) model, to improve student engagement and learning outcomes in IPAS (Natural and Social Sciences) for Grade X students.
Methods: The study employed a Research and Development (R&D) approach using the ADDIE model, covering Analysis, Design, Development, Implementation, and Evaluation. The media included interactive features such as visual simulations, drag-and-drop tasks, embedded videos, and quizzes with instant feedback. It was validated by three subject-matter experts and tested in stages: individual trials (3 students), small-group trials (6 students), and a field test with 64 students divided into experimental and control groups. Instruments included expert validation sheets, practicality questionnaires, pretest and posttest assessments. Data were analyzed using descriptive statistics and independent t-tests.
Results: The media received a validation score of 88.7% (highly feasible). Practicality ratings from teachers and students averaged 89.4%. The experimental group showed significantly higher posttest scores than the control group ($p < 0.05$), with moderate learning gains.
Conclusion: Canva-based interactive media, when combined with the PjBL model, is valid, practical, and effective for enhancing engagement and learning outcomes in vocational science education. It is suitable for broader implementation across similar educational settings.

A. Introduction

Education is a crucial foundation for human development (Sebu, 2023). A high-quality education system is essential for nurturing capable individuals who can face complex life challenges and problem-solving situations (Rahayu & Rosti, 2023). However, Indonesia continues to face challenges regarding the low quality of its education (Panggabean & Himawan, 2016). Research has shown that Indonesia's education quality remains subpar due to various systemic issues, including an overly complicated curriculum, uninspiring teaching methods, inadequate infrastructure, and consistenly low student performance (Nirzam & Ramadhan, 2023; Pramiarsih, 2019; Rulandari, 2021).

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To address these challenges, the Indonesian government issued Government Regulation No. 19 of 2017, which emphasizes that teachers must holistically master pedagogical, personal, social, and professional competencies in managing learning aligned with technological advances (Shidiq et al., 2022). Consequently, educators are expected to integrate technology-based methods, models, and media to create more effective and engaging learning experiences (Boling et al., 2012; Ramkissoon et al., 2020). Rapid technological advancements require educators to innovate in developing teaching media that can support students in both theoretical and practical aspects (Martin & Betrus, 2020). Digital media, especially interactive platforms, have been recognized as powerful tools in enhancing communication, contextual learning, and student engagement (Lee & Branch, 2023). Media can concretize abstract scientific concepts and make learning more accessible and interactive (Sriadhi et al., 2022).

One promising pedagogical approach is Project-Based Learning (PjBL), which encourages students to engage actively in real-world problems, promoting critical thinking, collaboration, and deeper understanding (Nuri et al., 2023; Astawa et al., 2017). Previous studies has revealed that PjBL can significantly improve student learning outcomes in science subjects (Khuluq et al., 2023).

Despite these developments, the application of such approaches remains limited. At SMKN 3 Medan, for instance, student learning outcomes in Physics—part of the broader IPAS (Ilmu Pengetahuan Alam dan Sosial) curriculum—are still below the minimum competency threshold. Recent exam data from the school showed a pass rate of only 25% among tenth-grade students, highlighting a serious learning gap.

Several factors contribute to this underperformance, including limited teacher proficiency in using digital media, outdated instructional practices, and inadequate school facilities. Many educators still rely on conventional tools such as PowerPoint, and have limited exposure to modern interactive media that resonate with today's digitally native students. To bridge this gap, there is a pressing need to develop and implement interactive learning media that align with students' learning preferences and technological trends. One such tool is Canva, a digital platform with multimedia capabilities suitable for educational purposes. Canva allows for the creation of visual and interactive content—such as videos, presentations, and infographics—and even supports virtual learning environments. Research by Purnamasari (2023) and Sofya & Adzkia (2023) found that integrating Canva with PjBL increased both motivation and learning outcomes in science subjects.

Although existing studies have explored the effectiveness of PjBL and Canva separately or in general education contexts, little research has specifically focused on developing interactive learning media that integrates Canva with PjBL for IPAS subjects in vocational schools. This study addresses that gap by designing, implementing, and evaluating an interactive media prototype based on the ADDIE and Dick & Carey instructional design models (Candiasa (2022). Therefore, the purpose of this study is to develop practical, effective and feasible interactive learning media based on Project-Based Learning using Canva to improve IPAS learning outcomes among tenth-grade students at SMKN 3 Medan.

B. Research Methods

This study employed a Research and Development (R&D) approach using the ADDIE model—Analysis, Design, Development, Implementation, and Evaluation—to develop an interactive learning medium based on Project-Based Learning (PjBL) using Canva (Larson & Lockee, 2019). This model was chosen because it provides a systematic and structured framework for designing and validating educational media, ensuring that the product meets both the pedagogical and technological needs of the classroom.

The study was conducted at SMKN 3 Medan during the even semester of the 2024/2025 academic year. This school was selected because interactive media had not yet been optimally utilized in IPAS (Natural and Social Sciences) classes, and there was a clear need to improve student engagement and enhance learning outcomes. The study involved a total of 64 students, divided into two groups: 32 students in the experimental group who used the interactive multimedia, and 32 students in the control group who received conventional instruction. Prior to the implementation in the classroom, the interactive multimedia underwent several testing phases: individual testing with 3 students, small group testing with 6 students, and field testing with 30 students to evaluate its effectiveness and usability.

The population of the study consisted of all tenth-grade students at SMKN 3 Medan. The samples were selected through simple random sampling, resulting in two classes: one serving as the experimental group and the other as the control group. The experimental class received instruction using the developed interactive media, while the control group continued with conventional learning methods.

The implementation phase of the study included three levels of product testing: individual testing involving three students, small group testing with nine students, and field testing with thirty students.

The development process began with the analysis phase, which included curriculum analysis, an analysis of student characteristics, and a needs analysis conducted through interviews, observations, and document review. The design phase involved creating a storyboard and flowchart for the media structure, aligning the content with learning outcomes and learner characteristics. In the development phase, the Canva-based interactive media was produced, incorporating multimedia elements such as instructional videos, quizzes, interactive tasks, and reflection activities designed to follow the six stages of PjBL.

Implementation involved real-time testing of the media in the classroom environment, where student responses, usability, and learning effectiveness were observed and documented. Following implementation, the evaluation phase assessed the practicality and effectiveness of the product. Practicality was evaluated using questionnaires filled out by both students and teachers, while effectiveness was assessed using a posttest given to both experimental and control groups.

Data collection techniques included interviews with IPAS teachers and curriculum staff, observations of classroom learning processes, documentation of lesson plans and student activities, questionnaires for usability purposes and for validation by media, material, and design experts, and standardized multiple-choice learning outcome tests. The test instruments were reviewed and analyzed for validity, reliability, difficulty level, and discrimination index prior to use.

Data were analyzed using both descriptive and inferential statistics. Validation and practicality results were analysed using mean score interpretations based on established criteria. The interpretation of the average scores followed the categories shown in Table 1.

Table 1. Interpretation Criteria for Average Scores

Average Score Range	Category
3.25 – 4.00	Very Good
2.50 – 3.24	Good
1.75 – 2.49	Fair
1.00 – 1.74	Poor

These categories were used to interpret expert validation results and student responses regarding the practicality of the developed interactive multimedia. For effectiveness analysis, the data from the posttests were tested for normality using the Shapiro-Wilk test and for homogeneity using One-Way ANOVA. If assumptions were met, hypothesis testing was conducted using an independent samples t-test. The hypothesis tested was whether there was a statistically significant difference in learning outcomes between students taught using the interactive media and those who were not.

The scope of this study was limited to the topic “Energy and Its Transformations” within the IPAS subject for tenth-grade students. The media was developed specifically for this topic and tested only at SMKN 3 Medan, which may limit its generalizability to other topics or educational settings. Additionally, the study measured immediate learning outcomes and did not examine long-term retention or student attitudes beyond the scope of the testing phase.

C. Results and Discussion

1. Results

The development of the interactive learning media in this study followed the ADDIE model, beginning with a needs analysis, curriculum analysis, and learner characteristics assessment. These analyses revealed that the existing learning approaches in IPAS (Natural and Social Sciences) classes at SMKN 3 Medan were monotonous and lacked digital support, making the content—especially "Energy and Its Transformations"—difficult for students to grasp. The media was developed using Canva, integrating six phases of the Project-Based Learning (PjBL) model: essential questions, planning, scheduling, project execution, product evaluation, and reflection. The media featured interactive content, quizzes, audio-visual explanations, and collaborative input fields. Based on expert reviews and iterative testing, the product was revised and improved until it reached an acceptable quality standard.

1.1. Feasibility Analysis

To ensure the feasibility of the developed media, three categories of experts—namely, material, design, and media—were involved in validation. The validation process produced the following results:

Table 1. Media Feasibility Assessment by Experts

Expert Type	Mean Score	Percentage	Criteria
Content Expert	4.55	91.0%	Highly Feasible
Instructional Design Expert	4.45	88.9%	Highly Feasible
Media Expert	4.31	86.3%	Highly Feasible
Average	4.43	88.7%	Highly Feasible

The results indicate that the media is highly feasible for classroom use, based on expert validation in content accuracy, instructional quality, and media design.

1.2. Practicality Analysis

The practicality of the interactive media was assessed through trials involving teachers and students in individual, small group, and field settings. Feedback was collected on accessibility, usefulness, and presentation. The results are presented below:

Table 2. Practicality Test Results

Respondent	Mean Score	Percentage	Criteria
Teacher	4.48	89.7%	Highly Practical
Student	4.45	89.0%	Highly Practical
Average	4.47	89.4%	Highly Practical

The findings show that the media is easy to use, informative, and supports active learning—making it practical for both teachers and students.

1.3. Effectiveness Analysis

To evaluate the effectiveness of the media, a posttest was administered to both experimental and control classes. The experimental class used the developed Canva-based PjBL media, while the control class followed conventional instruction.

Table 3. Posttest Scores Summary

Group	Min Score	Max Score	Mean	Std. Deviation
Experimental	60	100	82	9.86
Control	43	80	60	10.70

These results suggest a notable performance improvement in the experimental group. To confirm the statistical significance of this difference, hypothesis testing was conducted.

Prior to the t-test, normality and homogeneity tests were performed. The Shapiro-Wilk test showed p-values > 0.05 for both groups (Experimental = 0.799, Control = 0.430), confirming normal distribution. Levene's test indicated homogeneity with p = 0.684. An independent sample t-test was then applied:

Table 4. Independent Samples t-Test

t	df	Sig. (2-tailed)	Mean Difference	95% CI (Lower – Upper)
8.537	62	0.000	6.594	5.05 – 8.138

The p-value (0.000) is less than 0.05, indicating a statistically significant difference in learning outcomes between the two groups. This confirms that the use of Canva-based interactive media with PjBL effectively improves student achievement in IPAS.

2. Discussion

The results of this study show that the development of interactive learning media based on Project-Based Learning (PjBL) using Canva is highly feasible, practical, and effective in improving student learning outcomes in IPAS, particularly on the topic "Energy and Its Transformations". The media was developed through the ADDIE model, ensuring a structured and systematic instructional design process. Validation from experts confirmed the product's strong alignment with curriculum goals and pedagogical best practices, while student trials demonstrated that the media increased engagement, motivation, and

understanding. This improvement was largely attributed to the interactive features embedded in the multimedia, such as simulations, drag-and-drop activities, quizzes with instant feedback, and embedded videos that visualize abstract concepts. These features allowed students to explore content actively, receive immediate reinforcement, and connect theory with real-world applications, thereby enhancing both engagement and conceptual understanding. The statistical analysis showed a significant difference in posttest results between students in the experimental group (who used the Canva-based interactive media) and the control group (who received traditional instruction). These results suggest that incorporating technology-enhanced learning with PjBL can support more active and meaningful learning experiences. These results are in line with research conducted by Septiani et al. (2023) and Purnamasari (2023) who also found that the integration of Project-Based Learning (PjBL) with digital tools such as Canva significantly improved student motivation and learning outcomes. Similar to the current study, both studies emphasized that using Canva allowed students to express creativity, collaborate effectively, and better understand complex material through visual representation. However, this study extends previous findings by incorporating interactive multimedia elements—such as simulations and quizzes—which further enhanced student engagement and conceptual understanding, making the learning experience more immersive and responsive.

2.1. Implications

The findings imply that integrating PjBL into digital media development can significantly enhance the quality of science instruction in vocational schools. The use of interactive platforms like Canva enables both teachers and students to create, present, and reflect collaboratively—activities that are in line with the demands of 21st-century skills. For teachers, this medium provides a structured yet flexible tool that supports differentiated instruction and student-centered learning. For students, it promotes critical thinking, creativity, and collaboration through hands-on project implementation. This study also reinforces the importance of aligning instructional media with student characteristics, technological readiness, and pedagogical models that foster active engagement. The successful implementation of this media at SMKN 3 Medan highlights its potential for broader adoption in similar educational contexts.

2.2. Research contribution

This study contributes to the growing body of literature on digital learning and project-based instruction by offering a concrete example of how Canva can be utilized as a platform for interactive and collaborative science learning. Unlike previous studies that focused solely on either PjBL or Canva, this study integrates both components into a cohesive instructional tool tailored for vocational high school settings. Moreover, the study provides a practical development model based on the ADDIE framework, complete with expert validation and multi-stage implementation trials. This structured approach can serve as a reference for future educational media development, particularly in resource-constrained environments.

2.3. Limitations

Despite its promising results, this study has several limitations. First, the media was tested only on one topic of "Energy and Its Transformations" and was implemented at a single school (SMKN 3 Medan), limiting its generalizability. Second, the sample size was relatively small (32 students per group), which may affect the robustness of the statistical analysis. Third, the study focused only on short-term learning outcomes, without evaluating long-term retention or skill development. Lastly, although the product showed strong practicality, it was not yet tested in a broader full-scale dissemination setting.

2.4. Suggestions

Future studies should expand the implementation of this medium across different topics and schools to assess scalability and generalizability. Researchers may also explore long-term impacts on student learning and engagement, including retention, problem-solving skills, and teamwork. In addition, integrating adaptive learning features and mobile access could further enhance the media's accessibility and responsiveness to individual learner needs. For educators, it is recommended to receive adequate training in the use of Canva and PjBL frameworks to maximize instructional impact. Schools and policymakers should also consider supporting the development and integration of similar interactive media to foster innovation in science education.

D. Conclusion

This study aimed to develop interactive learning media integrating Project-Based Learning (PjBL) with Canva to enhance learning outcomes in the IPAS subject for tenth-grade students at SMKN 3 Medan. Guided by the ADDIE development model, the process included stages of analysis, design, development, implementation, and evaluation. The final product underwent expert validation and was tested through individual, small group, and field trials. The expert validation results showed a feasibility score of 88.7%, indicating that the media is highly appropriate for classroom use. Practicality assessments involving teachers and students produced average scores above 89%, confirming the media's ease of use and relevance to the learning context. Furthermore, effectiveness testing demonstrated a statistically significant improvement in learning outcomes in the experimental group compared to the control group. These results indicate that the Canva-based interactive media not only aligns with curriculum goals and pedagogical principles but also successfully fosters student engagement, motivation, and conceptual understanding—particularly on the topic of "Energy and Its Transformations". The integration of visual design, interactive tasks, and Project-Based Learning encourages active participation and deeper comprehension. Therefore, this media is well-suited for broader implementation in vocational science education and holds potential as a model for technology-integrated instruction in similar contexts.

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F. Author Contribution Statement

IAS was responsible for conceptualizing the study, developing the interactive media, and conducting the data analysis. AJ contributed to the instructional design, coordinated the implementation in the classroom, and supported the data collection process. D provided guidance on the study methodology, supervised the validation and testing stages, and reviewed the final manuscript. All authors contributed equally to the discussion and approved the final version of the article.

References

Astawa, N. L. P. N. S. P., Artini, L. P., & Nitiasih, P. K. (2017). Project-based learning activities and efl students' productive skills in english. *Journal of Language Teaching and Research*, *8*(6). https://doi.org/10.17507/jltr.0806.16

Boling, E. C., Hough, M., Krinsky, H., Saleem, H., & Stevens, M. (2012). Cutting the distance in distance education: Perspectives on what promotes positive, online learning experiences. *Internet and Higher Education*, *15*(2), 118–126. https://doi.org/10.1016/j.iheduc.2011.11.006

Candiasa, I. M. (2022). Application of Instructional Design Models by Prospective Teacher Students. *Jurnal Pendidikan Dan Pengajaran*, *55*(3). https://doi.org/10.23887/jpp.v55i3.54946

Khuluq, K., Kuswandi, D., & Soepriyanto, Y. (2023). Project-Based Learning dengan Pendekatan Gamifikasi: Untuk Pembelajaran yang Menarik dan Efektif. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *6*(2), 072. https://doi.org/10.17977/um038v6i22023p072

Larson, M. B., & Lockee, B. B. (2019). Streamlined ID. In *Streamlined ID*. https://doi.org/10.4324/9781351258722

Lee, H., & Branch, R. M. (2023). *Educational Media and Technology Yearbook*. Springer Cham. https://doi.org/10.1007/978-3-031-43048-0

Martin, F., & Betrus, A. K. (2020). *Digital Media for Learning*. Springer Cham. https://doi.org/10.1007/978-3-030-33120-7

Nirzam, M., & Ramadhan, P. (2023). The Role of SDG 4: Quality Education on the Internationalization of Indonesia's Education. *Hasanuddin Journal of Strategic and International Studies (HJSIS)*, *1*(2). https://doi.org/10.20956/hjsis.v1i2.27442

Nuri, B., Zikriana, L., & Iqbal, I. (2023). Effectiveness of Desmos Application Integrated with PjBL in Multimedia Mathematics Learning in Terms of Mathematical Literacy Skills. *Jurnal Penelitian Pendidikan IPA*, *9*(11). https://doi.org/10.29303/jppipa.v9i11.5497

Panggabean, M. S., & Himawan, K. K. (2016). The Development of Indonesian Teacher Competence Questionnaire. *Journal of Educational, Health and Community Psychology*, *5*(2), 1. https://doi.org/10.12928/jehcp.v5i2.5134

Pramiarsih, E. E. (2019). Singapore's Education Concept: Comparative and Applicative Study to The Quality of Indonesia's Education. *International Journal of Science and Applied Science: Conference Series*, *3*(1). https://doi.org/10.20961/ijsascs.v3i1.32548

Purnamasari, D. E. (2023). Implementing the PJBL (Project Based Learning) Method Using Canva Infographics to Improve Student's Creativity and Multicultural Understanding. *IJTIMAIYA: Journal of Social Science Teaching*, *7*(1). https://doi.org/10.21043/ji.v7i1.19343

Rahayu, A., & Rosti, R. (2023). Interactive Digital Teaching Module Based on Differentiated Instruction and Its Impact on Students' Problem-Solving Skills. *Jurnal Penelitian Pendidikan IPA*, *9*(SpecialIssue). https://doi.org/10.29303/jppipa.v9ispecialissue.5072

Ramkissoon, P., Belle, L. J., & Bhurosy, T. (2020). Perceptions and experiences of students on the use of interactive online learning technologies in Mauritius. *International Journal of Evaluation and Research in Education*, *9*(4), 833–839. https://doi.org/10.11591/ijere.v9i4.20692

Rulandari, N. (2021). Study of Sustainable Development Goals (SDGS) Quality Education in Indonesia in the First Three Years. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *4*(2). https://doi.org/10.33258/birci.v4i2.1978

Sebu, S. (2023). Access to Quality Education, a Basic Right of Every Child. *Journal of Education, Society and Behavioural Science*, *36*(7). https://doi.org/10.9734/jesbs/2023/v36i71234

Septiani, V. D., Haryani, S., & Isdaryanti, B. (2023). Science Learning with The Project Based Learning (PjBL) Model Assisted by Canva on the Learning Independence of Fifth Grade Students. *International Journal of Research and Review*, *10*(6), 489–495. https://doi.org/10.52403/ijrr.20230661

Shidiq, A. A. P., Rozi, F., & Purnama, Y. (2022). Professional Competency Analysis of Physical Education Teachers at The Level of Private Madrasah Ibtidaiyah Based on Government Regulation Number 19 of 2017. *Al-Aulad: Journal of Islamic Primary Education*, *5*(2). https://doi.org/10.15575/al-aulad.v5i2.20001

Sofya, R., & Adzkia, S. F. (2023). Pengembangan E-Modul dengan Aplikasi Canva dan Flipbook Pada Pembelajaran Ekonomi. *Jurnal Ecogen*, *6*(1). https://doi.org/10.24036/jmpe.v6i1.14430

Sriadhi, S., Hamid, A., & Restu, R. (2022). Web-Based Virtual Laboratory Development for Basic Practicums in Science and Technology. *TEM Journal*, *11*(1), 396–402. https://doi.org/10.18421/TEM111-50