

Development of E- Comic Education on Anti Drugs Based on Local Wisdom to Foster Character Culture From an Early Age

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ABSTRAK. Penelitian ini bertujuan untuk mengembangkan Pendekatan Flipped E-Komik Pendidikan Anti Narkoba berbasis Kearifan Lokal. Tahap desain pendekatan ini menjadi fokus utama dengan memperhatikan nilai-nilai budaya dan kearifan lokal siswa. Penelitian ini mencakup identifikasi tujuan pembelajaran yang mencerminkan karakter budaya dan nilai-nilai anti narkoba, pemilihan konten pembelajaran yang sesuai dengan kearifan lokal siswa, pengembangan format E-Komik yang memadukan elemen-elemen budaya, interaktivitas, desain antarmuka pengguna yang mencerminkan unsur budaya lokal, serta penggunaan media visual dan multimedia yang mendukung nilai-nilai budaya. Tahap pengujian prototipe tutorial E-Komik melibatkan siswa dari beragam latar belakang budaya, dengan tujuan mendapatkan umpan balik yang diperlukan untuk perbaikan desain. Hasil pengujian prototipe digunakan untuk memperbaiki dan menyesuaikan desain tutorial E-Komik agar sesuai dengan tujuan pembelajaran. Penelitian ini mengintegrasikan elemen-elemen budaya dan kearifan lokal dalam desain pembelajaran, menciptakan alat pembelajaran yang sesuai dengan konteks budaya siswa. Penelitian ini menyoroti pentingnya desain pembelajaran yang mempertimbangkan nilai-nilai budaya dan lokal dalam mencapai tujuan pendidikan anti narkoba, serta menunjukkan bahwa pendekatan seperti Flipped E-Komik dapat menjadi alternatif yang efektif dalam pendidikan karakter budaya dan kesadaran anti narkoba pada siswa sejak dini.

Kata Kunci : Pendidikan Anti Narkoba, Kearifan Lokal, E- komik

ABSTRACT. This study aims to develop a Flipped E-Comic approach for anti-drug education based on students' local wisdom. The design stage of this approach is the main focus, emphasizing cultural values and students' local knowledge. This research includes identifying learning objectives that reflect cultural character and anti-drug values, selecting learning content relevant to students' cultural backgrounds, and developing an E-comic format that integrates cultural elements. It also includes creating an interactive user interface that reflects local cultural features and utilizing visual and multimedia components that support cultural values. The prototype testing stage involved students from diverse cultural backgrounds to collect feedback for further design improvements. The results were used to improve the E-Comic tutorial design to align with the intended learning objectives. This research integrates cultural elements and local wisdom into instructional design, creating a learning tool that is culturally relevant to students. The study highlights the importance of instructional design that considers cultural and local values in achieving anti-drug education goals. It also demonstrates that the Flipped E-Comic approach can serve as an effective alternative for promoting cultural character education and raising anti-drug awareness among students from an early age.

Keywords: Anti-Drug Education, Students' Local Wisdom, E-Comic

INTRODUCTION

Drugs, often referred to in full as NAPZA (Narcotics, Alcohol, Psychotropics, and other Addictive Substances), are dangerous chemicals that can affect the performance of the central nervous system (Hawi, 2018). Cases of drug abuse are one form of juvenile delinquency. However, this cannot be attributed solely to the will of the youth themselves, as external environmental influences or acts of protest against perceived injustice from parents or society may also play a role (Ansharuddin, 2018). Children often shift their enjoyment toward negative activities, such as drugs consumption. The high number of juvenile delinquency cases, including

drug abuse, is partly due to adolescence as a transitional period marked by significant physical, psychological, and social upheaval. Thus, adolescents are easily influenced and prone to making fatal mistakes that may jeopardize their future (Lestari, Humaedi, & Hasanah, 2017; Harefa, 2019). This situation highlights the urgent need for careful attention to drug abuse cases to prevent more young generations from falling into such destructive behaviors. Previous research and recent findings indicate that drug abuse cases in Indonesia are increasing, resulting in a significant rise in the number of drug convicts (Siskawati, 2021). These convicts come from various social groups—children, teenagers, and adults—who may become producers, distributors, or users of narcotics in Indonesia (Suyatna, 2018). Drug abuse in Indonesia is particularly prevalent among students, influenced by factors such as weak parental supervision, peer association, bullying or social exclusion, peer environments that also use drugs, or simply curiosity and the desire for pleasure (Juanda, Fauzan, Satriananda, & Yusnianti, 2017). These conditions form the foundation for this study, which focuses on addressing the dangers of drugs among students.

The purpose of this research is to utilize Industry 4.0 technology, particularly the Flipped E-Comic based on students' local wisdom. The urgency of developing this medium is supported by Haan, van Gorp, Knippenberg, and Olthuis (2022), who stated that illustrated media can increase awareness, emotional regulation, and spontaneity. Similarly Herd, Jindal-Snape, Murray, and Sinclair (2020) further explained that comics can be aligned with teaching methods, making abstract material more attractive for children. Harismawan (2020) demonstrated that web-based comics are more popular among students, as they allow learning without time and space constraints. Therefore, this study proposes the development of a Flipped E-Comic based on students' local wisdom to address drug-related issues with the hope of instilling cultural values in students from an early age. The Flipped E-Comic based on students' local wisdom offers several benefits, particularly in transforming conventional learning into modernized instructional approach. Previous studies support this innovation. For instance, Erina (2022) showed improvements in students' Minimum Mastery Criteria (KKM); Susilawati (2022) found that this approach was effective; Handayani, Nuryani, and Iriawan (2019) highlighted its role in helping students acquire real-world information; Mandasari (2019) found improved student learning outcomes; and Subroto, Qohar, and Dwiyan (2020) noted its potential for cultural integration.

This study attempts to integrate the Flipped E-Comic, based on students' local wisdom as an innovative learning tool to prevent drug abuse among students and youth. In this context, Saefudin (2020) highlighted the crucial role of Islamic religious teachers in integrating anti-drug messages within educational settings. This study complements that idea by developing innovative and engaging learning media—the Flipped E-Comic—to effectively deliver anti-drug messages to students. Similarly, Ula et al. (2020) emphasized the importance of anti-drug counseling based on Islamic spirituality, while this study adopts that approach by utilizing technology through the Flipped E-Comic to convey the message. Moreover, Mustafa et al. (2019) highlighted the importance of anti-drug education in the Industry 4.0 era, a challenge in this study addresses with technology-based, culturally relevant learning media. Setyawan (2018) also showed that drug prevention based on national character values is essential for students. Thus, this study integrates anti-drug messages with character education through the Flipped E-Comic framework.

Other studies have further supported the relevance of this approach. Hendayani (2019) emphasized the importance of character education in the 4.0 era to address generational character shifts. In this context, this current study creates media that strengthen student character and provide a deep understanding of the dangers of drugs. Verawati et al. (2021) addressed students' lack of knowledge about drugs and responded by developing learning modules, while this study offers an interactive Flipped E-comic as an alternative. Safitri and Syaifudin (2018) stressed the importance of early anti-drug education, a principle this research upholds through creative and engaging media. Finally, Rusdi et al. (2021) highlighted the active role of youth in preventing drug abuse, which this study addresses by involving students and young people in developing and

disseminating anti-drug messages through Flipped E-Comic. By incorporating these perspectives, this study aims to provide a holistic contribution to drug abuse prevention and anti-drug awareness by leveraging technology and students' local wisdom as core prevention strategies.

METHOD

This research is a developmental study (Research and Development) carried out using the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation) developed by Dick Walter and Lou Carey (2005). This approach was applied to develop a Flipped E-comic based on Local Wisdom in Anti-Drug Learning as an innovative learning medium. The study involved elementary school teachers as subjects. Also, it included a lecturer as an expert in the development process of the Flipped E-comic based on Local Wisdom in Anti-Drug Learning. The research procedure followed the ADDIE development model stages, which included several important steps. The first stage was analysis, in which an evaluation was conducted on the needs of students and teachers regarding the understanding of the dangers of drugs. Then, the design stage included preparing a blueprint of the Flipped E-comic as a guideline suited to the students' needs. The development stage focused on creating the prototype of the Flipped E-comic, along with preparing the required tools and materials. The implementation stage was carried out on a small scale, involving teachers and students as the first users. Finally, the evaluation stage involved collecting feedback from users and experts to refine and improve the product.

The research instruments included questionnaires, interviews, and analysis instruments. The collected data were analyzed using statistical software such as SPSS and SEM, as well as through expert and teacher assessments. The results of this analysis served as the basis for revising the prototype of the Flipped E-comic based on Local Wisdom in Anti-Drug Learning. Furthermore, product assessment was conducted through evaluation using field simulation and attitude questionnaires to measure the changes in students' perceptions and behavior after implementing this learning medium.

RESULT AND DISCUSSION

In today's era of rapid technological development, education has become one of the most dynamically evolving fields. This study presents an in-depth exploration of the potential development of Flipped Anti-Drug Educational E-Comics based on students' local wisdom, with the aim of fostering cultural character from an early age. Anti-drug education is an important aspect in creating a strong and responsible future generation. Students' local wisdom is at the core of this research, acting as a rich cultural resource, in an effort to create a deep understanding of the dangers of drugs and how to prevent them. A "flipped" approach to learning is used to utilize digital technology, allowing students to learn basic material independently through interactive comics before participating in more in-depth discussions and activities in the classroom.

This study aims to explore the extent to which the use of Flipped Anti-Drug Educational E-Comics can positively influence students' cultural character and anti-drug awareness. It is essential to recognize that this approach is not merely about adopting technology, but also about integrating it with students' local wisdom to achieve the desired educational objectives. The first step of this research involves a comprehensive understanding of students' local wisdom and the development of an appropriate and effective interactive comic. Through these steps, the research examines the potential of the Flipped E-Comic approach in shaping students' cultural character and strengthening their anti-drug awareness, while also identifying challenges and opportunities

that emerge during the process. These stages serve as the foundation for generating deeper insights into how this approach can contribute to anti-drug education rooted in local wisdom. In this report, each stage of the research process is described in detail, accompanied by in-depth analysis and relevant recommendations for the further development of effective Flipped E-Comics within the educational context.

Analysis

The analytical steps in this research on the Development of Flipped Anti-Drug Education E-Comics based on Local Wisdom focuses on identifying the problem and establishing the all-important learning objectives. Students play a key role in this process, as their needs and characteristics form the foundation for designing an effective learning model. The first step in the analysis involves problem identification and the establishment of clear learning objectives. Through identifying the core issues, the study aims to understand the challenges students face regarding drug-related problems and to formulate learning objectives that can effectively address these challenges. Next, the research includes an analysis of learning objectives and student engagement, which is crucial for understanding the characteristics of the primary audience (Richardson et al., 2017). This includes understanding students' educational backgrounds, technological capabilities, and learning styles (Maatuk et al., 2022). A deep understanding of the target learners allows for the design of a learning approach that is more appropriate and effective. The next stage is the analysis of educational materials and content, which focuses on selecting learning materials relevant to drug issues and local cultural characteristics (Gay, 2013). Appropriate content is crucial to achieving learning objectives. Additionally, an analysis of suitable technologies for E-Comics, including the hardware and software requirements, forms a vital component of this stage (US Department of Education, 2017). Furthermore, an analysis of constraints and risks during the development and implementation of this approach helps identify potential obstacles that may arise and plan solutions to overcome them. Analysis of evaluation methods is a crucial step in determining how to measure the effectiveness of this approach and level of student satisfaction (Phadermrod et al., 2019). Finally, an analysis of institutional readiness is conducted to ensure that educational institutions possess adequate infrastructure and resources to support the implementation of this learning innovation (Zabolotniaia et al., 2020).

All these analytical stages form a strong basis for the development of the Flipped E-comic Approach to Anti-Drug Education based on Students' Local Wisdom, supported by previous research from the last five years that is relevant to the field of education and the use of technology in learning.

Design

The design stage in the research on the "Development of Flipped Anti-Drug Educational E-Comics Based on Students' Local Wisdom" has a central role in creating a learning approach that is effective and in accordance with educational objectives. This study successfully detailed the design stages by considering students' cultural values and local wisdom as key elements (Hidayati et al., 2020; Regmi & Jones, 2020). One of the most important initial stages is developing learning objectives. Identifying learning objectives that reflect cultural characteristics and anti-drug values is a crucial foundation for development. These objectives should include a deep understanding of local wisdom concepts and awareness of the dangers of drugs (Zainal et al., 2021). Then, in the learning content design stage, selecting appropriate materials is crucial. The chosen content should be relevant to the wisdom of local students, while problem drugs become an important aspect. This involves selecting content appropriate to local cultural values and relevant topics in an anti-drug context (Hellman et al., 2015).

The next step is selecting an appropriate E-comic format (Wahyuni, 2021). Selecting a format that combines students' local wisdom and cultural values is a crucial step in ensuring the

effectiveness of the tutorial. The development of interactive elements that encourage student participation is also a major focus (Martin & Bolliger, 2018). The user interface design must reflect local cultural elements to ensure that students can interact with the tutorial with understanding and respect for local wisdom (Putri, 2021). The use of visual media, graphics, and multimedia elements that depict cultural values and local wisdom is also an integral part of this design stage, ensuring that the tutorial reflects the cultural character and values it seeks to convey (Edi, 2022).

The prototype testing phase of the E-comic tutorial involves students or user groups with diverse cultural backgrounds (Mustika, 2019). This is a crucial stage in obtaining the feedback necessary for design improvements and changes. The final stage is design refinement, where the results of the prototype testing are used to refine and adjust the e-Comic tutorial design to align with the established learning objectives (Heuwing et al., 2016). The entire design process in this study is strengthened by references from various previous studies in various relevant fields, including education, culture, and the use of technology in learning. By referring to the findings of previous studies, this study strengthens its argument and highlights the importance of each design stage involving students' cultural values and local wisdom (Eko & Putranto, 2019). In the context of anti-drug education, this study strengthens the conceptual and practical basis for character building. Culture and awareness against drugs in students from an early age through the Flipped E-comic approach (Lakshmi & Paul, 2018).

This study successfully integrated cultural elements and local wisdom into the learning design, creating learning tools that are culturally appropriate for the students' context (Hidayati et al., 2020). Taking into account the findings of previous similar studies, this study emphasizes the importance of learning design that incorporates local cultural values to effectively achieve educational objectives in anti-drug education (Zainal et al., 2021). Furthermore, this study shows that an approach like Flipped E-comic can be an effective alternative for promoting cultural character education and enhancing anti-drug awareness among students.

Develop

The development phase of the research on the Development of Flipped E–Anti-Drug Educational Comics Based on Students' Local Wisdom is an essential phase in creating an effective learning approach that aligns with cultural values and local wisdom. This phase consists of several key steps. First, in the development phase, the developers will begin by designing and creating the E-comic based on the results of the previous design phase. This involves incorporating previously planned educational content into the E-comic format. This process requires selecting a visual style that aligns with local wisdom and culture, as well as crafting a story that is relevant to the goals of anti-drug education. Next, validity testing by experts in education and cultural represents a vital step in this stage. The developer engage experts from the fields of education, culture, language, and drugs prevention to evaluate the quality of the E-Comic. Experts will review and assess E-Comics from various aspects, including their effectiveness in conveying anti-drug messages, the accuracy of representing local wisdom, cultural appropriateness, and the sustainability of cultural character development.

Feedback from experts will be a valuable source of information for the improvement and refinement of e-comic. Validation from specialists across multiple disciplines ensure that the final product accurately and effectively reflects both local wisdom and cultural values. The insights obtained from education, culture, and language experts guide further revisions and enhancements to the E-Comic.. Therefore, the development phase is key to ensuring that cultural character and anti-drug awareness are effectively instilled in students from an early age through the Flipped E-Comics approach.

This research is supported by validation from 33 experts with expertise in the fields of education, culture, Language, and drugs prevention. By involving experts from various backgrounds, this study ensures that the developed E-Comics reflect local wisdom and the goals of anti-drug education well. By referring to the validation results and contributions of experts, this study strengthens its argument in creating a powerful learning approach to instill cultural character and anti-drug awareness in students from an early age through Flipped E-Comics approach. The analysis results show that all assessment items in the content component achieved a very high level of validity. The overall average for the content component aspect is 91.72%, with the category "very valid." This result indicates that the local wisdom-based E-comic design has successfully achieved a very high level of content validity in measuring and presenting learning materials. High content validity in the context of E-comics is a key factor because it reflects the accuracy, relevance, and precision of the content delivered to students for cultural character building.

To strengthen these findings, this study refers to previous research that has identified factors contributing to content validity in digital or multimedia learning contexts. For example, research by Kuba et al. (2021) provided important insights into strategies for improving content validity in multimedia learning materials. In addition, research by Murti (2020) reviews aspects of E-comic design and learning-based learning, emphasizing their relevance to content validity in the development of anti-drug E-Comics. These references provide theoretical support for the strong validity achieved in this study and reinforce the role of cultural values in enhancing the educational impact of digital learning media. Research by Ontrup et al. (2020) and O'Dowd and Dooly (2020) also provides insights into multimedia design principles that can enhance content validity in culture-based learning contexts. Referring to these studies and citing their references strengthens the argument that the high level of content validity in the design of anti-drug E-comics based on local wisdom. The results of applying previously tested principles of multimedia design and learning provide confidence that the E-comic content meets high validity criteria in supporting the goal of developing early cultural character in students.

In addition to the content component aspect, another aspect assessed to measure the level of validity of the local wisdom-based E-comic design is the language component aspect. The analysis results illustrate the analysis results on the language component aspect in the context of the anti-drug E-Comic based local wisdom. Four items were analyzed, and the average score for the language component reached 90.76%, categorized as "very valid." This finding indicates that the language component in this E-comic has a very high level of validity, indicating that the use of language in the comic content is very accurate, relevant, and in accordance with the established learning criteria.

The results of this study demonstrate that the language used in E-comics meets high standards in terms of accuracy, relevance, and consistency with established learning criteria. These findings align with a series of previous studies that have emphasized the importance of appropriate language use in local wisdom-based learning contexts. For example, studies by Alakrash et al. (2021) and Darong (2022) support the view that accurate and relevant language use in local culture-based learning significantly improves students' understanding of the material. Furthermore, the literature consistently supports the importance of effective linguistic elements in improving the overall effectiveness of culturally grounded learning media. While some studies have differing perspectives, as noted by Priyangga et al. (2022), this research overall supports the view that accurate, relevant, and appropriate language use in accordance with learning criteria is a key factor in the success of local wisdom-based E-comics. Therefore, the findings of this study regarding the validity reinforce and extend the conclusions of prior research, underscoring the crucial role of language accuracy and cultural appropriateness in the effectiveness of educational media.

The analysis also illustrates the assessment of the presentation component aspects in the context of the local wisdom-based anti-drug E-comic. Four items were analyzed, and the average percentage obtained was 89.70%, categorized as "very valid." This finding provides concrete evidence that this E-comic achieves a high level of validity in terms of material presentation. This includes aspects such as presentation structure, visualization, and teaching approaches that align with established learning standards. The success of iE-comics in terms of the validity of this presentation component has been confirmed by several previous studies. Several studies, such as those conducted by Sari and Murdiono (2021) and Ratminingsih et al. (2020), found that the use of visualization techniques can significantly improve students' understanding in the context of local culture-based learning. Similarly, Aminullah et al. (2019) and Widyaningrum & Prihastari (2020) noted that a well-structured presentation can improve material retention in local culture-based learning. The results of this study are consistent with these findings and support the existing body of knowledge.

This emphasizes the importance of valid presentation components in the context of local culture-based learning. In other words, E-comics that have been positively evaluated in terms of the validity of material presentation can be considered a significant contribution to existing research in this field. The analysis results describe the assessment of the graphic components in the context of the local wisdom-based anti-drug E-comic. Of the four items analyzed, the average percentage reached 90.00%, categorized as "very valid." This finding suggests that the graphic elements, including visualizations, diagrams, and illustrations, in the E-comic have been effectively implemented and align with the established learning objectives.

In this context, the results of this study are supported by previous studies that have explored the use of graphic elements in digital or multimedia learning. For example, the theory outlined by Li et al. (2019) in the context of multimedia learning illustrates how graphic elements can enhance comprehension. Research by Hapsari and Hanif (2019) investigated the role of animation and graphic elements in enhancing comprehension and communication of complex information. This aligns with the findings revealed in research by Coskun and Cagiltay. (2022), which discusses the effectiveness of using animation and graphic elements in learning. multimedia. In addition, research by Hameed and Jabeen (2022) discusses the impact "Attention-grabbing" graphic information in learning, and the importance of its wise use.

Referring to these studies provides strong support for the argument that the high level of validity in the E-Comic's graphic components results from the implementation of effective graphic design principles proven successful in digital and multimedia learning. This also confirms that the graphic elements in the E-Comic make a positive contribution to the learning experience and support the improvement of student performance in the areas of local wisdom and drug prevention. The data analysis revealed the assessment of program components in the context of the local wisdom-based anti-drug i-comic. Of the 5 items analyzed, the average percentage reached 90.42% with the category "very valid." This result is strong evidence that the learning program design in E-comic has been carefully designed and meets the established learning standards. In this context, the evaluation indicating a high level of validity in the E-comic learning program design reinforces the importance of effective learning programs in the context of local wisdom-based learning technology.

These findings are supported by several previous studies that underscore the success of valid learning program designs in holographic learning. Matere et al. (2021) highlighted the positive impact of well-structured and valid learning program designs at increasing engagement with students and strengthening their understanding of hologram learning materials. Similar findings were also reported in research by Huang & Chen (2022), who stated that an appropriate learning program design can enhance learning effectiveness in anti-drug educational environments.

Thus, the evaluation results that confirm the high level of validity of the E-comic program components in this study provide a positive contribution and strengthen the credibility of the i-comic-based learning method, thereby enhancing our understanding of the importance of designing careful learning programs in the context of local culture-based learning technology and drug prevention.

Based on the description of the validation results presented above, the overall expert validation outcomes for all aspects can be seen in Table 1.

Table 1. Expert Validation Results Across All Aspects

No	Aspect	Percentage (%)	Category
1	Content Component	91.72%	Very Valid
2	Language Component	90.76%	Very Valid
3	Presentation Component	89.70%	Very Valid
4	Graphics Component	90.00%	Very Valid
5	Program Component	90.42%	Very Valid
	Average	90.52%	Very Valid

Table 1 provides a comprehensive overview of the assessment results on five key aspects relevant to this local wisdom-based anti-drug E-comic: content, language, presentation, graphics, and program. These results clearly demonstrate that the design of this E-comic underwent a rigorous evaluation process, resulting in a high level of validity, with an average percentage of 90.52% and a "very valid" category. This is a very strong indicator that this E-comic has been very well-designed and has fulfilled validity standards within the context of early cultural character education. The importance of validity in designing E-comics based on local culture has been reinforced by previous research. For example, research by Uge et al. (2019) confirmed that valid designs within the context of local wisdom can enhance learning effectiveness and help students understand and apply cultural values from an early age.

Research by Setiawan et al. (2022) and Ruminum et al. (2022) also drew attention to the issue of validity, in the development of E-comics based on local culture. The results of this study indicate that E-comics with a high level of validity tend to have a positive impact on the formation of students' cultural character and provide a strong foundation for understanding and appreciation of local wisdom. Therefore, this finding is consistent with existing literature that underscore the importance of validity in the design of E-comics based on local wisdom. The conclusion that this E-comic has achieved a high level of validity by experts in the context of early cultural character education is very supportive. It provides a very strong basis for continuing this E-comic to the implementation stage, with confidence that the design has met high validity standards and will provide positive benefits for students in forming their cultural character from an early age.

Jenis kelamin

33 jawaban

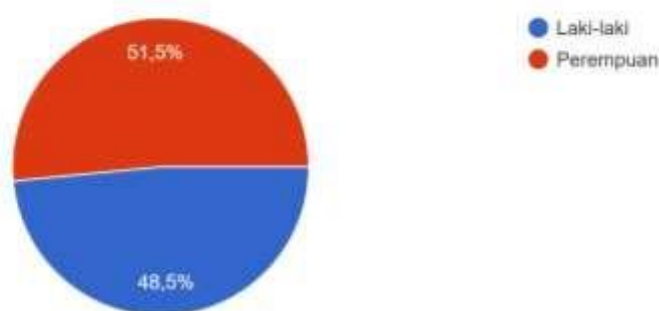


Figure 1. Diagram Percentage Team Validator

Respondents in the trial were given a questionnaire to assess the practicality of the online comic learning media developed. In assessing the level of practicality, there are several aspects that need to be reviewed, namely ease of use, presentation, readability, efficiency, effectiveness, and the role of educational games. Table 2 presents the results of the practicality of online comic learning by students.

Table 2. Practicality Results of Online Comics by Students

No	Aspect	Percentage (%)	Category
1	Ease of Use	89.94	Practical
2	Readability	89.21	Practical
3	Efficiency	89.70	Practical
4	Effectiveness	91.39	Practical
5	Role of Educational Games	90.18	Practical
	Average	90.08	Very Practical

Table 2 provides a very positive picture of the practicality of the local wisdom-based E-comic tutorial. All assessment aspects investigated in this study, including the content component, language component, presentation component, graphics component, and program component, with all received ratings in the "very practical" category and an average score of 90.08%. This is strong evidence that the E-comic was well-received by students and considered a practical learning tool. This factor is key to integrating technology into the learning process.

To further support these findings, we can refer to recent research examining the factors that influence the practicality and acceptance of technology in learning. Several studies, including those by Nordlöf et al. (2019) and Serhan (2020), have examined students' attitudes and perceptions toward technology in learning contexts. These findings provide valuable insights into why these i-comics are perceived as practical and acceptable by students. Concepts such as "perceived usefulness" and "perceived ease of use," which have been elaborated in research by McMullan et al (2023), can also be applied in understanding the practicality of E-comic tutorials. This indicates that these E-comic tutorials are not only considered practical but also considered helpful and easy to use by students. Overall, these positive findings regarding the practicality of e-comics reinforce the existing research foundation on the integration of technology in local wisdom-based education. This E-comic tutorial has excellent potential to improve students' academic performance and support early cultural character education. Based on previous research and the findings of this study, this E-comic tutorial can be considered a valuable tool in developing cultural character education in students.

CONCLUSION

This study explores the development of local wisdom-based e-comics as a learning tool to support anti-drug education and instill cultural character in students from an early age. Based on the research results, we can draw several important conclusions: 1) The developed E-comic tutorial successfully achieved a very high level of validity in all assessment aspects, including content, language, presentation, graphics, and program components. This indicates that this tutorial design is very strong in terms of accuracy, relevance, and quality of learning offered to students; 2) Students responded positively to this E-comic tutorial, which was considered very practical. This provides strong evidence that E-comic can serve as an effective and engaging learning tool, well-received by students and easy to integrate into educational settings; and 3) Integration of local wisdom into the e-comics give a solid framework for cultural character education from an early age. This approach not only strengthens students' understanding of

cultural values but also promotes awareness of the dangers of drug abuse—issues that are often at odds with traditional moral and cultural principles.

REFERENCES

- Alakrash, H., Edam, B., Bustan, E., Armnazi, M., Enayat, A., & Bustan, T. (2021). Developing english language skills and confidence using local culture-based materials in the EFL curriculum. *Linguistica Antverpiensia*, 1, 548-564.
- Aminullah, F., Sada, C., & Sudarsono, S. (2019). Local culture-based reading materials for EFL context. In *Proceedings International Conference on Teaching and Education (ICoTE) Vol. 2, No. 2*.
- Coskun, A., & Cagiltay, K. (2022). A systematic review of eye-tracking-based research on animated multimedia learning. *Journal of Computer Assisted Learning*, 38(2), 581-598.
- Darong, H. C. (2022). Local-culture-based materials in online cooperative learning: Improving reading achievement in Indonesian context. *Journal of Innovation in Educational and Cultural Research*, 3(3), 361-372.
- Edi, S. (2022). BAB 4 MODUL AJAR. *Perencanaan Pembelajaran (Kurikulum Merdeka Belajar)*, 37.
- Eko, B. S., & Putranto, H. (2019). The role of intercultural competence and local wisdom in building intercultural and inter-religious tolerance. *Journal of Intercultural Communication Research*, 48(4), 341-369.
- Erina, S. (2022). Meningkatkan hasil belajar matematika siswa dengan menggunakan pendekatan CTL pada siswa kelas III Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 4(2), 2012–2022. <https://doi.org/10.31004/edukatif.v4i2.2044>
- Gay, G. (2013). Teaching to and through cultural diversity. *Curriculum inquiry*, 43(1), 48-70.
- Haan, M. M., van Gurp, J. L. P., Knippenberg, M., & Olthuis, G. (2022). Facilitators and barriers in using comics to support family caregivers of patients receiving palliative care at home: A qualitative study. *Palliative Medicine*, 36(6), 994–1005. <https://doi.org/10.1177/02692163221093513>
- Hakim, M. N., & Rahayu, F. D. (2019). Pembelajaran SAINTIFIK berbasis pengembangan karakter. *Nazhruna: Jurnal Pendidikan Islam Vol.*, 2(1), 1–27. <https://doi.org/10.31538/nzh.v2i1.148>
- Hameed, A., & Jabeen, I. (2022). Prompting cognition for creativity in EFL context: an experimental study on use of infographics for teaching writing skill. *Journal of Language and Linguistic Studies*, 18(1), 724-737.
- Handayani, R. M., Nuryani, P., & Iriawan, S. B. (2019). Penerapan pendekatan RME untuk meningkatkan pemahaman konsep matematis siswa kelas IV SD. *Jurnal Pendidikan Guru Sekolah Dasar*, 4(III), 329–337. Retrieved from <https://ejournal.upi.edu/index.php/jpgsd/article/view/22909>
- Hapsari, A. S., & Hanif, M. (2019). Motion graphic animation videos to improve the learning outcomes of elementary school students. *European Journal of Educational Research*, 8(4), 1245-1255.
- Harefa, B. (2019). *Kapita Selektta Perlindungan Hukum Bagi Anak*. Yogyakarta: DEEPUBLISH.
- Harismawan, W. (2020). Penggunaan komik berbasis web pada mata pelajaran sejarah siswa SMA. *Indonesian Journal of Instructional Media and Model*, 2(1), 40. <https://doi.org/10.32585/ijimm.v2i1.634>
- Hawi, A. (2018). Remaja Pecandu Narkoba: Studi tentang Rehabilitasi Integratif di Panti Rehabilitasi Narkoba Pondok Pesantren Ar-Rahman Palembang. *Tadrib: Jurnal Pendidikan Agama Islam*, IV(1), 109–119.

- Hellman, M., Majamäki, M., Rolando, S., Bujalski, M., & Lemmens, P. (2015). What causes addiction problems? Environmental, biological and constitutional explanations in press portrayals from four European welfare societies. *Substance Use & Misuse*, 50(4), 419- 438.
- Hendayani, M. (2019). Problematika Pengembangan Karakter Peserta Didik. *Jurnal Penelitian Pendidikan Islam*, 7(2), 183–198.
- Herd, D., Jindal-Snape, D., Murray, C., & Sinclair, M. (2020). Comics jam: Creating healthcare and science communication comics – a sprint co-design methodology. *Studies in Comics*, 11(1), 167–192. https://doi.org/10.1386/jem_00020_1
- Heuwing, B., Mandl, T., & Womser-Hacker, C. (2016). Methods for user-centered design and evaluation of text analysis tools in a digital history project. *Proceedings of the Association for Information Science and Technology*, 53(1), 1-10.
- Hidayati, N. A., Waluyo, H. J., & Winarni, R. (2020). Exploring the Implementation of Local Wisdom-Based Character Education among Indonesian Higher Education Students. *International Journal of Instruction*, 13(2), 179-198.
- Hidayati, N. A., Waluyo, H. J., & Winarni, R. (2020). Exploring the Implementation of Local Wisdom-Based Character Education among Indonesian Higher Education Students. *International Journal of Instruction*, 13(2), 179-198.
- Huang, T. C., & Chen, Y. J. (2022). Do Personality Traits Matter? Exploring Anti-drug Behavioral Patterns in a Computer-Assisted Situated Learning Environment. *Frontiers in psychology*, 13, 812793.
- Juanda, Fauzan, R., Satriananda, & Yusnianti, E. (2017). Penyuluhan pencegahan, penyebaran dan penggunaan narkoba di desa meunasah mesjid punteut kecamatan blang mangat kota lhokseumawe. *Jurnal Vokasi*, 1(2), 104–107.
- Kuba, R., Rahimi, S., Smith, G., Shute, V., & Dai, C. P. (2021). Using the first principles of instruction and multimedia learning principles to design and develop in-game learning support videos. *Educational Technology Research and Development*, 69, 1201-1220.
- Lakshmi, V. V., & Paul, M. M. (2018). Value education in educational institutions and role of teachers in promoting the concept. *International Journal of Educational Science and Research*, 8(4), 29-38.
- Lestari, E. G., Humaedi, S., S, M. B., & Hasanah, D. (2017). Peran keluarga dalam menanggulangi kenakalan remaja. *Jurnal Penelitian & PKM*, 4(2), 129–389.
- Li, J., Antonenko, P. D., & Wang, J. (2019). Trends and issues in multimedia learning research in 1996–2016: A bibliometric analysis. *Educational Research Review*, 28, 100282.
- Ansharuddin M. (2018). Upaya Pendidikan Keluarga Dalam Menanggulangi Kenakalan Remaja di Desa Daun Sangkapura Bawean Gresik. *CENDIKIA: Jurnal Studi Keislaman*, 4(2), 215–232.
- Maatuk, A. M., Elberkawi, E. K., Aljawarneh, S., Rashaideh, H., & Alharbi, H. (2022). The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. *Journal of computing in higher education*, 34(1), 21-38.
- Mandasari, D. S. (2019). Pengembangan Bahan Ajar Pkn Kelas V Yang Berorientasi Pada Pendekatan Ctl (Contextual Teaching and Learning) Untuk Meningkatkan Hasil Belajar Siswa Sekolah Dasar Di Sdn Lerpak 3 Bangkalan. *Jurnal Review Pendidikan Dasar : Jurnal Kajian Pendidikan Dan Hasil Penelitian*, 5(2), 1003–1008. <https://doi.org/10.26740/jrpd.v5n2.p1003-1008>
- Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online learning*, 22(1), 205-222.

- Matere, I., Weng, C., Chien-Yu, C., & Chi-Hao, C. (2021). The opportunities and challenges of integrating hologram experiments into a highly visual telepresence course. *Jurnal Pendidikan IPA Indonesia*, 10(1), 1-14.
- McMullan, J., Graham-Wisener, L., Sloan, S., Waterworth, R., Gordon, R., Close, C., ... & Toner, P. (2023). The development of a person-centred core outcome set for adolescents and young adults with spinal deformity undergoing treatment.
- Murti, D. K. (2020). Development of Educational Comic with Local Wisdom to Foster Morality of Elementary School Students: A Need Analysis. *International Journal of Educational Methodology*, 6(2), 337-343.
- Mustafa, I. R., Abdillah, M. B., Winata, N. R., Pratama, R., Isnanda, R., Putra, T. D. A., & Sulisty, W. D. (2019). Edukasi Gerakan Siswa Anti Narkoba” (Geswana) Era Desrupsi 4.0 Di Smp Wahid Hasyim Malang. *DINAMISIA - Jurnal Pengabdian Kepada Masyarakat*, 3(2), 189–197.
- Mustika, A. (2019). Pengujian Prototipe Tutorial I-Komik dalam Konteks Kearifan Lokal. *Jurnal Teknologi Pembelajaran*, 14(2), 101-114.
- Nordlöf, C., Hallström, J., & Höst, G. E. (2019). Self-efficacy or context dependency?: Exploring teachers’ perceptions of and attitudes towards technology education. *International Journal of Technology and Design Education*, 29(1), 123-141.
- O’Dowd, R., & Dooly, M. (2020). Intercultural communicative competence development through telecollaboration and virtual exchange. *The Routledge handbook of language and intercultural communication*, 361-375.
- Ontrup, G., Schempp, P. S., & Kluge, A. (2022). Choosing the right (HR) metrics: digital data for capturing team proactivity and determinants of content validity. *Journal of Organizational Effectiveness: People and Performance*, 9(2), 212-232.
- Phadermrod, B., Crowder, R. M., & Wills, G. B. (2019). Importance-performance analysis based SWOT analysis. *International journal of information management*, 44, 194-203.
- Priyanga, B., Sarwi, S., Widiyatmoko, A., Herlina, E., Marwoto, P., & Sumarni, W. (2022). Development of e-comic based on local wisdom to improve scientific literacy. *Ta'dib*, 25(2), 140-149.
- Putri, S. (2021). Desain Antarmuka Pengguna yang Memadukan Kearifan Lokal dalam Pembelajaran. *Jurnal Teknologi Pendidikan*, 15(1), 33-46.
- Ratminingsih, N. M., Budasi, I. G., & Kurnia, W. D. A. (2020). Local Culture-Based Storybook and Its Effect on Reading Competence. *International Journal of Instruction*, 13(2), 253-268.
- Regmi, K., & Jones, L. (2020). A systematic review of the factors—enablers and barriers—affecting e-learning in health sciences education. *BMC medical education*, 20(1), 1-18.
- Richardson, J. C., Maeda, Y., Lv, J., & Caskurlu, S. (2017). Social presence in relation to students' satisfaction and learning in the online environment: A meta- analysis. *Computers in Human Behavior*, 71, 402-417.
- Rumainum, M. C. S., Jazuli, M., & Cahyono, A. (2022). Development Of Papua Contextual Drama Scripts Based on Digital E-Comics in SMP Negeri 3 Manokwari. *Catharsis*, 11(1), 50-59.
- Rusdi, M., Azaluddin, Iksan, M., Hajar, I., Bugis, R., Hatuwe, R. S. M., & Susiati. (2021). Upaya Pencegahan Peredaran Narkoba Melalui Edukasi Gepdana (Gerakan Pemuda Anti Narkoba). *Journal Of Community Dedication And Development*, 1(2), 118–130.
- Saefudin, M. (2020). Peran Guru Pendidikan Agama Islam dalam Implementasi Program Gerakan Anti Narkoba Sebagai Upaya Pencegahan Penggunaan Zat Adiktif pada Siswadi SMA NU Juntinyuat. *EDUPROF: Islamic Education Journal*, 2(1), 76–100.

- Safitri, E. I., & Syaifudin, A. (2018). Pengembangan Buku Pengayaan Menulis Teks Eksposisi Berbasis Gerakan Antinarkoba. *Jurnal Pendidikan Bahasa Dan Sastra Indonesia*, 7(2), 29–34.
- Sari, D. R., & Murdiono, M. (2021, October). Culture-based education improves national insight. In *ISTED 2021: Proceedings of the 1st International Seminar on Teacher Training and Education, ISTED 2021, 17-18 July 2021, Purwokerto, Indonesia* (Vol. 302). European Alliance for Innovation.
- Serhan, D. (2020). Transitioning from Face-to-Face to Remote Learning: Students' Attitudes and Perceptions of Using Zoom during COVID-19 Pandemic. *International Journal of Technology in Education and Science*, 4(4), 335-342.
- Setiawan, D., Yuniarti, Y. D., & Rahmadani, N. K. A. (2022). E-Comic of Folklore in the Javanese Language to Increase 4th Graders' Learning Outcomes. *Tadris: Jurnal Keguruan dan Ilmu Tarbiyah*, 7(1), 91-101.
- Setyawan, I. (2018). Pencegahan Penyalahgunaan Narkotika Berbasis Nilai Nilai Karakter Bangsa Pada Mahasiswa. *Jurnal Penelitian Pendidikan Sosial Humaniora*, 3(2), 374– 379.
- Siskawati, D. (2021). Komunikasi Dakwah Dalam Meningkatkan Self Control Pada Narapidana Narkoba Dilapas Kelas II A Pekanbaru. *Syntax Literate: Jurnal Ilmiah Indonesia*, 6(3), 1123–1136.
- Soetijono, I. K., Mulyanto, R., & Marwiyah. (2020). Diklat Relawan Anti Narkoba sebagai Partisipasi dalam Pemberantasan Penyalahgunaan Narkoba. *ABDI: Jurnal Pengabdian Dan Pemberdayaan Masyarakat*, 2(1), 11–17.
- Subroto, E. N., Qohar, A., & Dwiyan, D. (2020). Efektivitas Pemanfaatan Komik sebagai Media Pembelajaran Matematika. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 5(2), 135. <https://doi.org/10.17977/jptpp.v5i2.13156>
- Sulistio, M. F., Waluyanto, H. D., & Zacky, A. (2019). Perancangan Komik Online Untuk Memperkenalkan Socially Prescribed Perfectionism Bagi Generasi Milenial. *Jurnal DKV Adiwarna*, 1(14), 10.
- Susilawati, W. O. (2022). Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Contextual Teaching and Learning (CTL) di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 4(3), 4922–4938. <https://doi.org/10.31004/edukatif.v4i3.2909>
- Suyatna, U. (2018). Narcotics policy evaluation at 34 provinces in indonesia. *Sosiobumaniora - Jurnal Ilmu-Ilmu Sosial Dan Humaniora*, 20(2), 168–176.
- Uge, S., Neolaka, A., & Yasin, M. (2019). Development of Social Studies Learning Model Based on Local Wisdom in Improving Students' Knowledge and Social Attitude. *International Journal of Instruction*, 12(3), 375-388.
- Ula, M., Zuhri, A., & Farmawati, C. (2020). Penyuluhan Anti Narkoba Berbasis Spiritual Islam. *ABDIMAS: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 5(2), 105–114.
- US Department of Education. (2017). Reimagining the role of technology in education: 2017 national education technology plan update. *National Education Technology Plan Update*.
- Verawati, Harapan, E., & Fitria, H. (2021). Pengembangan Modul Anti Narkoba. *Jurnal Manajemen, Kepemimpinan, Dan Supervisi Pendidikan*, 6(1), 67–76.
- Wahyuni, R. (2021). Pengembangan Media Pembelajaran Berbasis Kearifan Lokal dalam Pencegahan Narkoba. *Jurnal Media Pendidikan*, 12(2), 125-138.
- Widyaningrum, R., & Prihastari, E. B. (2020). Student worksheet based on Surakarta's local wisdom in primary school: A preliminary research. In *International Journal of Science and Applied Science: Conference Series* (Vol. 4, No. 1, pp. 56-65).
- Wijayanti, T. S. (2020). Usaha Pencegahan Bahaya Narkoba Melalui Kader Anarmuka Di SMANegeri 1 Labuapi. 'The 2st National Conference on Education, Social Science, and Humaniora "Potensi Penelitian Dan Pengabdian Di Era New Normal", 129–137.

- Zabolotniaia, M., Cheng, Z., Dorozhkin, E., & Lyzhin, A. (2020). Use of the LMS Moodle for an effective implementation of an innovative policy in higher educational institutions. *International Journal of Emerging Technologies in Learning (IJET)*, 15(13), 172-189.
- Zainal, S., Yunus, S., Jalil, F., & Khairi, A. (2021). The policy of local government to implement peace education at secondary school post armed conflict in Aceh Indonesia. *Journal of Social Studies Education Research*, 12(2), 377-409.
- Zainal, S., Yunus, S., Jalil, F., & Khairi, A. (2021). The policy of local government to implement peace education at secondary school post armed conflict in Aceh Indonesia. *Journal of Social Studies*