Educational Media: Digital Comics Based on a Contextual Approach on the Topic of the Water Cycle

I Gede Yuda Suwandinata[1]*, Kadek Suranata[2] (ID)

[1,2] Primary School Teacher Education, Ganesha Education University, Singaraja, Indonesia

ABSTRAK

Rendahnya pemahaman konsep siswa disebabkan oleh kurangnya penggunaan media pembelajaran muatan IPA kelas V dalam kegiatan pembelajaran. Maka penelitian ini bertujuan untuk menghasilkan media edukasi komik digital berbasis pendekatan kontekstual konten sains topik siklus air untuk kelas V SD. Penelitian ini menggunakan model pengembangan 4D dan melibatkan dua ahli media, dua ahli materi, serta satu guru dan enam siswa kelas V sebagai subjek uji produk. Pengumpulan data dilakukan melalui kuesioner dan dianalisis menggunakan teknik analisis deskriptif kuantitatif dan kualitatif. Hasil penelitian menunjukkan bahwa media edukasi komik digital yang dikembangkan mempunyai validitas yang tinggi dari segi materi dan media pembelajaran. Tes praktik yang melibatkan guru dan siswa menunjukkan tingkat ketercapaian masing-masing sebesar 94% dan 96%. dengan kriteria sangat baik. Dengan mempertimbangkan desain, validitas ahli, dan uji produk, maka dapat disimpulkan bahwa media edukasi komik digital berbasis pendekatan kontekstual konten IPA topik siklus air untuk kelas V SD dinilai layak dan dapat digunakan sebagai media pembelajaran. media pendukung kegiatan pembelajaran. Diharapkan penerapan media ini dapat memperkaya proses pembelajaran IPA di kelas V SD dan memberikan pembelajaran yang lebih interaktif dan menyenangkan.

ABSTRACT

The low understanding of concepts and the lack of utilization of science (IPA) learning media for fifth-grade students in the learning activities are the main issues addressed in this study. The purpose of this research is to develop a contextual-based digital comic educational media on the topic of the water cycle for fifth-grade students in elementary school. The study employs the 4D development model and involves two media experts, two subject matter experts, one teacher, and six fifth-grade students as participants in the product testing phase. Data collection is carried out through questionnaires and analyzed using quantitative and qualitative descriptive analysis techniques. The research findings indicate that the developed digital comic educational media has high validity in terms of content and learning media. The practicality test involving teachers and students shows an achievement level of 94% and 96%, respectively, which indicates excellent criteria. Considering the design, expert validity, and product testing, it can be concluded that the contextual-based digital comic educational media on the water cycle topic for fifth-grade students is considered feasible and can be used as a supporting media in learning activities. It is hoped that the implementation of this media can enrich the science learning process in fifth-grade students and provide a more interactive and enjoyable learning experience. it can be concluded that the contextual-based digital comic educational media on the water cycle topic for fifth-grade students is considered feasible and can be used as a supporting media in learning activities. It is hoped that the implementation of this media can enrich the science learning process in fifth-grade students and provide a more interactive and enjoyable learning experience. it can be concluded that the contextual-based digital comic educational media on the water cycle topic for fifth-grade students is considered feasible and can be used as a supporting media in learning activities. It is hoped that the implementation of this media can enrich the science learning process in fifth-grade students and provide a more interactive and enjoyable learning experience.

Corresponding author
*E-mail addresses: Suwandinata094@gmai.com (I Gede Yuda Suwandinata)

1. INTRODUCTION

Human resources in the digitalization era are very important to develop and improve, with the aim of creating a global society that has an important role in improving quality. Conscious efforts need to be made to achieve human resource development from various aspects, one of which is education. Education functions as the main foundation which aims to form positive character and personality in each individual(Pane & Dasopang, 2017; Sujana, 2019). This means that education is not just about providing a single goal but various goals to be achieved, such as knowledge, behavior, norms and skills possessed by students.(Semadi, 2019; Siregar et al., 2020). Education in Indonesia is divided into three levels, namely primary education, secondary education and higher education. Education in Indonesia is based on the curriculum that applies in this country (Dasi & Putra, 2022). Education continues to develop in line with changing times and the influence of globalization, requiring that the educational curriculum be updated to adapt to the current situation(Bahri, 2019; Fahrozy et al., 2022).The curriculum is an important component in providing education to achieve educational goals. The curriculum plays an important role in achieving educational goals, therefore the curriculum must continue to be updated in accordance with changing times and technological advances to create human resources that are able to compete in the era of globalization.(Febriyanti & Ain, 2021).In this era of globalization, digital learning media has become familiar to students. The availability of creative and innovative learning media is very important to support the success of the learning process. Learning media functions as an intermediary in the process of conveying information or learning material, making it easier for students to absorb and understand it(Karo-Karo & Rohani, 2018).Learning media is a communication tool used to convey information in an interesting way, in the form of printed or audiovisual aids, so that it is easy to understand in teaching and learning activities. Educational learning media or educational games are learning tools that can increase students' learning motivation and improve their understanding of learning material by using learning media(Citra & Rosy, 2020; Risma et al., 2019).

It's just in implementationThere are many problems that educators will encounter in the field, one of which is the application of learning media that is appropriate to the topic discussed at the meeting. This problem is usually when the teacher explains mathematics and science theory, because this material requires media that can help the teacher in carrying out the learning process.(Handayani, 2021). The problems faced by target schools are also not much different from the problems commonly experienced by teachers. Based on the results of a questionnaire at SD N 1 Tumbu, Karangasem District, Karangasem Regency, it was revealed that the homeroom teacher for class V stated that the media available at school was not very effective to use during this teaching assistance activity and all teachers stated that there was a serious lack of media in the learning process. Due to the wide coverage of science material, there is a need for media that is used to facilitate or support the learning process. Especially for science content, the availability of learning media is still limited. Especially material in class V elementary school on the topic of the water cycle which is difficult to understand and abstract in nature has an effect on the acceptance of the material being less than optimal. Therefore,

One learning media that can be used to improve students' science learning outcomes is digital comic learning media.Comic media has unique characteristics so that it is able to stimulate the attention of some people both in terms of educational level, socio-economic status and so on(Dasi & Putra, 2022; Zorlu, 2021).The nature of the comic in question is that it contains elements of healthy humor, contains elements of excitement, contains elements of entertainment, is handy, focuses on humans.(Andayani et al., 2020; Kanti et al., 2018). If you learn using interesting media, students will easily respond to the meaning contained in the learning material that will be delivered, thus helping students develop ideas expressed in the form of dialogue.(Kanti et al., 2018; Zorlu, 2021). Water cycle material is material that explains how the water cycle occurs, human activities that influence the water cycle, and how to maintain the water cycle(Adawiyah et al., 2022; Murni & Yasin, 2021). This material is very important to teach in elementary schools with the aim that students can know and understand how they should behave and really care about nature(Laksmi & Suniasih, 2021; Supartayasa & Wibawa, 2022). This hydrological cycle process consists of several stages, namely: evaporation process, evapotranspiration process, rain process, water flow process, groundwater deposition process, and groundwater flow to the sea. Teaching theoretical concepts of hydrology will be difficult for teachers so that it often does not get the attention of students(Adawiyah et al., 2022; Murni & Yasin, 2021). Because water cycle material requires instructions or concepts that students must truly understand. If students only learn by listening to lectures from the teacher, the material will be difficult for students to understand. So digital comic media is very reliable in conditions like this, this is because comic learning media is a form of visual learning model that can help students and teachers in learning activities both in class and outside the classroom. Comic media can be used in a two-way learning process, namely as a teaching aid and as a learning medium that can be used by students themselves(Fadillah, 2018; Kanti et al., 2018). Comics contain communication messages

packaged in the form of images so that they appear as a light story(Andayani et al., 2020; Darmayanti & Abadi, 2021).The pictures in comics are different from picture story books. The application of comic media in the learning process will be more effective if it is accompanied by a contextual approach, this is because the contextual approach is implemented by linking the learning process with students' daily lives. (Permana & Sujana, 2021; Widiastuti, 2021).It is further explained that the contextual approach is a learning approach that starts from the process of taking, stimulating, understanding, and asking questions about various phenomena that occur in everyday life which is then adapted into learning material.(Friantini et al., 2020; Gading et al., 2019; Sari, 2022).Applying a contextual approach will make it easier for students to understand the material they are studying because it is related to everyday life(Azzahra et al., 2022; Geni et al., 2020).

Several studies that have been carried out previously revealed that e-comic media based on Problem Based Learning is suitable for use in learning the water cycle in science content for class V elementary school.(Laksmi & Suniasih, 2021). The results of other research reveal that e-comic learning media based on a contextual approach is significantly feasible to be developed and studied by students, especially in the material on changes in the shape of objects, science content for class V elementary school.(Dasi & Putra, 2022).The results of further research also reveal that the development of digital-based comic media can significantly improve students' critical thinking skills in metamorphosis material in higher grades(Andayani et al., 2020).Based on several research results, it can be seen that learning media in the form of digital comics can have a positive influence on student learning outcomes. It's just that in previous research, there has been no study that specifically discusses the development of digital comic media based on a contextual approach to the topic of the water cycle in class V. So this research focuses on this study with the aim of creating digital educational media comics based on a contextual approach to content. Science on the topic of the water cycle for class V elementary school which has been validated and has gone through practical trials.

2. METHOD

This research is classified as a type of development research, which is carried out using the 4D development model. The 4D development model consists of four stages, namely definition, planning, development and deployment. These four stages are very important, and their presentation is simplified compared to other design models. The selection of the 4D development model is based on its simple presentation process compared to other design models, and this research model is suitable for use as a basis for developing learning tools or learning media rather than developing a learning system. This research was conducted at SDN 1 Tumbu Karangasem, with research subjects namely 2 experts (material experts and media experts), one practitioner (teacher), and 6 class V students. The data collection method used includes the use of questionnaires.

This research was carried out through several stages, namely the definition stage which was carried out by carrying out an analysis of needs, curriculum, student characteristics and media; The planning (design) stage is carried out by carrying out instrument assessments and the product begins to be designed; The development stage is carried out by assessing research instruments by media experts and materials for media validation as well as drawing responses to media use (practitioners and students); and the dissemination stage which is carried out by disseminating the product so that it is known and used as a means of supporting learning. This research was carried out through several stages, namely the definition stage which was carried out by carrying out an analysis of needs, curriculum, student characteristics and media; The planning (design) stage is carried out by carrying out instrument assessments and the product begins to be designed; The development stage is carried out by assessing research instruments by media experts and materials for media validation as well as drawing responses to media use (practitioners and students); and the dissemination stage which is carried out by disseminating the product so that it is known and used as a means of supporting learning.

This research was carried out through several stages, namely the definition stage which was carried out by carrying out an analysis of needs, curriculum, student characteristics and media; The planning (design) stage is carried out by carrying out instrument assessments and the product begins to be designed; The development stage is carried out by assessing research instruments by media experts and materials for media validation as well as drawing responses to media use (practitioners and students); and the dissemination stage which is carried out by disseminating the product so that it is known and used as a means of supporting learning. and media; The planning (design) stage is carried out by carrying out instrument assessments and the product begins to be designed; The development stage is carried out by assessing research instruments by media experts and materials for media validation as well as drawing responses to media use (practitioners and students); and the dissemination stage which is

carried out by disseminating the product so that it is known and used as a means of supporting learning. and media; The planning (design) stage is carried out by carrying out instrument assessments and the product begins to be designed; The development stage is carried out by assessing research instruments by media experts and materials for media validation as well as drawing responses to media use (practitioners and students); and the dissemination stage which is carried out by disseminating the product so that it is known and used as a means of supporting learning. The data collection instruments in this research consisted of several types, including questionnaires filled in by material experts, questionnaires filled in by media experts, response questionnaires for teachers/practitioners, and response questionnaires from students. The instrument grid used in this research is contained in Tables 1, 2, 3, and 4.

Table 1. Material Expert Instrument Grid

No.	Aspect	Dimensions	Item Number	Number of Items
1	Material/content	Completeness and clarity in conveying identity	1, 2	2
		Delivery of learning objectives is clear	3	1
		Presentation of material clearly	4, 5, 6, 7, 8,	1
2	Language/ Communication	Appropriate use of language rules	9, 10, 11	3
		Use language that is easy for students to understand and comprehend	12	1
3	Presentation	Consistency in presentation	13, 14	2
		Integration in presentation	15	1
		Amount		**15**

Table 2. Media Expert Instrument Grid

No.	Aspect	Dimensions	Item Number	Number of Items
1	Voice and text	The text is presented clearly	1, 2	2
		Sound is presented clearly	3, 4	2
2	Visual	Illustrations are presented clearly	5, 6	2
		Attractive background display	7, 8	2
		Combination in the use of color	9, 10	2
3	Characterization	Character selection	11, 12	2
		Character Attractiveness	14	1
4	Overall View	Overall appearance integration	14, 15	2
		Amount		**15**

Table 3. Practitioner Instrument Grid

No.	Aspect	Dimensions	Item Number	Number of Items
1	Material/content	Completeness and clarity in conveying identity	1, 2	2
		Delivery of learning objectives is clear	3	1
		Presentation of material clearly	4, 5, 6, 7, 8,	5
2	Language/ Communication	Appropriate use of language rules	9, 10, 11	3
		Use language that is easy for students to understand and understand	12	1
3	Presentation	to the sequence in presentation	13, 14	2
		Integration in presentation	15	1
4	Voice and text	The text is presented clearly	16, 17	2
		Sound is presented clearly	18, 19	2
5	Visual	Illustrations are presented clearly	20, 21	2
		Attractive background display	22, 23	2
		Combination in the use of color	24, 25	2
6	Characterization	Character selection	26, 27	2

No.	Aspect	Dimensions	Item Number	Number of Items
		The attractiveness of the characters	28	1
7	Overall View	Overall appearance integration	29, 30	2
		Amount		**30**

Table 4. Instrument Grid for Students

No.	Aspect	Dimensions	Item Number	Number of Items
1	Material/content	The presentation of the material is easy to understand	1	1
		Presentation of material clearly	2	1
2	Language/ Communication	Use language that is easy for students to understand	3, 4	2
3	Presentation	Interesting in presenting material	5,6	2
4	Voice and text	Text is shown clearly	7, 8	2
		Sound is displayed clearly	9, 10	2
5	Visual	Images are presented clearly	11	1
		Attractive background display	12, 13	2
6	Characterization	Character Attractiveness	14	1
7	Overall View	The overall appearance is attractive	15	1
		Amount		**15**

The questionnaire was designed using a Likert scale with 5 response categories, namely very good with a score of 5, good with a score of 4, fair with a score of 3, poor with a score of 2, and very poor with a score of 1. Before being used to collect data, the instrument was tested first. for its feasibility/validity. The content validity of the material instrument was analyzed using the Gregory formula and the validity of the media content using the Aiken formula proof. After the instrument is declared feasible through validation, the instrument can be used to collect data. The data that has been obtained is analyzed descriptively qualitatively and quantitatively. These two analysis methods have different characteristics, namely processing data in the form of sentences (qualitative) and in the form of processing and interpreting numbers (quantitative).In this research, qualitative data was obtained through suggestions and input regarding learning media from experts, including material experts and media experts, as well as teacher and student responses. Quantitative descriptive analysis is used to describe the average scores obtained from experts, teachers and students.

3. RESULT AND DISCUSSION

Result

Digital comic educational media based on a contextual approach to science content on the topic of the water cycle was designed based on several problems that had previously been identified. This digital comic was created using the Power Points 2019 application and produced in video form so that it can be easily accessed by teachers and students. This media was developed in digital form which uses image, sound and motion elements in an integrated manner. The animation in digital comics is focused on the topic of the water cycle with 3 display parts, namely, opening, content and closing. In the opening section, the learning objectives and instructions for using comics are presented, as well as introducing the characters in the comics being developed. In the content section, a display is presented which focuses on the topic of the water cycle which is strengthened by a contextual approach as the material. Final, In the closing section, conclusions are presented and several tasks that must be completed by the user. The design view of the digital comic can be seen at Figure 1.

The completed digital comic educational media then goes through a feasibility/validity testing process by two experts. Validation carried out by material experts showed that digital comic media reached an achievement level of 1.00 from the Aiken criteria >0.8, this shows that the digital comic media developed received a high validity predicate/qualification in terms of material. Validation carried out by media experts shows an achievement level of 0.95 from the Aiken criteria >0.8, this shows that digital comic media has received a high validity predicate/qualification in terms of learning media. Next, the practicality of digital comic media was tested by involving teachers and students as assessment subjects. The assessment carried out by teachers/practitioners on digital comic media based on a contextual

approach showed an achievement level of 94% and was in the 90-100% range based on the five scale conversion PAP table, indicating that teachers responded to the developed digital comic media very well. In addition, individual tests were carried out on six students with different abilities, and they gave an assessment with an achievement level of 96% and were in the 90-100% range based on the five scale conversion PAP table, indicating that students responded very well to the digital comic media that was developed. Good.

Figure 1. Digital Comics Display

Discussion

Based on research that has been carried out, it is known that digital comic educational media based on a contextual approach has high validity. This can be seen from the results of the assessments of the two experts with an average percentage of 97.5%. This shows that the comic media developed is suitable for use in the learning process. This condition is supported by the development of media that applies in schools based on the curriculum and teaching materials.Apart from that, the use of language in the media becomes easier to understand and the evaluation tools are in accordance with the learning objectives to be achieved. Suitability of material to the curriculum reduces errors in delivering material and makes it easier for students to receive material presented in learning media correctly and accurately(Anastasia et al., 2022; Qoni'ah & Kuntjoro, 2023).Obtaining good qualifications is also due to clarity of language and the use of appropriate evaluation tools. Digital comic educational media uses illustrative images to support the presentation of material and facilitate students' understanding of material concepts, as well as help explain abstract concepts to be more concrete.(Jundu et al., 2020; Sholeh, 2019; Wulandari et al., 2021). Apart from that, the material presented in this media has been arranged systematically. Systematic presentation of material can help students build their understanding of the material being studied(Magdalena et al., 2020; Wiranata & Sujana, 2021).

Judging from the aspect of using learning media, digital comic educational media offers a number of advantages. In terms of appearance, this digital comic displays high-quality images, clear and easy-to-read letters, and an appropriate layout. The color composition used is also adjusted to be attractive and support a fun learning experience and the use of appropriate language in this digital comic helps students understand the content better(Gae, 2021; Hendraningrat & Fauziah, 2021).Apart from that, this digital comic educational media has met the eligibility criteria. Based on learning objectives, the digital comics that have been developed provide material that is relevant and can be applied in the curriculum. It is also easy to use and can be operated smoothly by users, both teachers and students. Furthermore, viewed from a learning design perspective, this digital comic educational media considers aspects of learning objectives, learning strategies, and learning evaluation. Learning objectives are implemented through digital comics to provide students with a comprehensive understanding of concepts(Guntur et al., 2023; Nabilah et al., 2023).The learning strategy designed follows learning steps based on a contextual approach that allows students to be actively involved in discussions and brings them closer to thinking about

concrete things.(Fauziah et al., 2019). In its use, this digital comic educational media has also proven to be practical. Teachers gave a high assessment of the practicality of this digital comic, with an assessment percentage of 94%. Students also consider the use of digital comics to be practical, with an assessment percentage of 96%. Practically, using digital comics makes it easier for teachers to deliver material and meet the needs of students with different learning styles. On the student side, these digital comics make it easier to understand the material, increase learning motivation, and create a pleasant learning atmosphere. The flexibility of using digital comics allows learning to be carried out in various situations and whenever needed(Ferania et al., 2022).So overall, digital comic educational media offers an interesting and effective approach to learning. With good display quality, suitability for use, well-planned learning design, and practical and flexible use, this digital comic makes a significant contribution to achieving learning goals and improving student learning outcomes.

The results obtained in this research are in line with the results of previous research, which also revealed that e-comic media based on Problem Based Learning is suitable for use in learning the water cycle in grade V elementary school science content.(Laksmi & Suniasih, 2021). The results of other research reveal that e-comic learning media based on a contextual approach is significantly feasible to be developed and studied by students, especially in the material on changes in the shape of objects, science content for class V elementary school.(Dasi & Putra, 2022).The results of further research also reveal that the development of digital-based comic media can significantly improve students' critical thinking skills in metamorphosis material in higher grades(Andayani et al., 2020).So based on several research results, it can be seen that learning media in the form of digital comics can have a positive influence on student learning outcomes.

4. CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that digital comic educational media based on a contextual approach to science content on the topic of the water cycle for class V elementary school is considered feasible and can be used as a media to support learning activities.

5. REFERENCES

Adawiyah, R., Faiz, A., & Yuningsih, D. (2022). Development of Magic Box Sikla (Water Cycle) Media in Science Learning Water Cycle Material for Class V. Edumaspul: Educational Journal, 6(1), 599–606.https://doi.org/10.33487/edumaspul.v6i1.2003.

Anastasia, MS, Sayono, J., & Subekti, A. (2022). Development of "Zapra" History Learning Media Based on Pop Up Books on Technological Material from Cultural Results of the Preliterate Age in Indonesia for Class X Iis 3 of Darut Taqwa Purwosari High School, Pasuruan Regency. Candrasangkala: Journal of Education and History, 8(2), 65–85.https://jurnal.untirta.ac.id/index.php/Candrasangkala/article/view/16722.

Andayani, F., Maula, LH, & Sutisnawati, A. (2020). Development of Digital-Based Comic Media on Students' Critical Thinking Abilities on Metamorphosis Material in Higher Classes. Matappa Education and Culture: Journal of Basic Education, 3(2), 308.https://doi.org/10.31100/dikdas.v3i2.666.

Azzahra, IM, Andriani, KM, Fatonah, S., & Wiranata, R. (2022). Online Learning Strategy Based on Contextual Teaching and Learning (CTL) in Science Learning in Elementary Schools. Basicedu Journal, 6(6), 9726–9735.https://doi.org/10.31004/basicedu.v6i6.4174.

Bahri, S. (2019). Madrasah Education Based on 4.0 in a Quality Management Frame. Edugama: Journal of Education and Social Religion, 5(1), 115–154.https://doi.org/10.32923/edugama.v5i1.962.

Citra, CA, & Rosy, B. (2020). Effectiveness of Using Quizizz Educational Game-Based Learning Media on Office Technology Learning Outcomes for Class X Students at Ketintang Vocational School, Surabaya. Journal of Office Administration Education (JPAP), 8(2), 261–272.https://doi.org/10.26740/jpap.v8n2.p261-272.

Darmayanti, NK, & Abadi, IBS (2021). Development of Virtual Comic Online Learning Media containing Main Ideas and Supporting Ideas in Indonesian. Pulpit PGSD Undiksha, 9(1), 170.https://doi.org/10.23887/jjpgsd.v9i1.32481.

Dasi, NLKD, & Putra, DBKS (2022). Development of E-Comics Learning Media Based on a Contextual Approach to Material on Changes in Form of Objects in Science for Class V Elementary School. Journal of Education and Counseling (JPDK), 4(3), 354–362.https://doi.org/10.31004/jpdk.v4i3.4311.

Fadillah, A. (2018). Development of Comic Learning Media on Student Learning Motivation. Journal of

Mathematical Theory and Applications, 2(1), 36.https://doi.org/10.31764/jtam.v2i1.259.

Fahrozy, FPN, Iskandar, S., Abidin, Y., & Sari, MZ (2022). 19th-20th Century Learning Efforts and 21st Century Learning in Indonesia. Basicedu Journal, 6(2), 3093–3101.https://doi.org/10.31004/basicedu.v6i2.2098.

Fauziah, SI, Zanthy, LS, & Kuswoyo, R. (2019). The Influence of a Multimedia-Based Contextual Learning Approach on the Mathematical Understanding Ability of Middle School Students. Journal on Education, 01(02), 247–255.https://jonedu.org/index.php/joe/article/view/53.

Febriyanti, DA, & Ain, SQ (2021). Development of a Mathematics Module Based on Ethnomathematics on Flat Figure Material in Elementary Schools. Basicedu Journal, 5(3), 1409–1417.https://doi.org/10.31004/basicedu.v5i3.933.

Ferania, M., Wardani, KW, Satya Wacana, K., Teacher Training, DF, Education, I., Kristen, U., Wacana, S., & Abstract, S. (2022). Development of KOMPAS Media (SD Science Comics) on the material of changes in the form of objects to increase the learning interest of grade 3 elementary school students. Scientific Journal of Educational Vehicles, 8(22), 489–499.https://jurnal.peneliti.net/index.php/JIWP/article/view/2891.

Friantini, RN, Winata, R., & Permata, JI (2020). Development of the Social Arithmetic Contextual Module for Class 7 Middle School. Scholar's Journal: Journal of Mathematics Education, 4(2), 562–576.https://doi.org/10.31004/cendekia.v4i2.278.

Gading, IK, Antara, PA, & Hidayat, AS (2019). The Influence of Contextual Teaching and Learning (CTL) on Kindergarten Children's Beginning Science Abilities. Pulpit of Science, 24(2), 141.https://doi.org/10.23887/mi.v24i2.21256.

Gae, N.A. (2021). Development of Reading Comprehension Oriented Animation Video Media Using Directed Reading Thinking Activity (DRTA) Strategy in Indonesian Language Content. Journal of Educational Research and Development, 5(1), 100–108.https://doi.org/10.23887/jppp.v5i1.32453.

Geni, KHYW, Sudarma, IK, & Mahadewi, LPP (2020). Development of Interactive Learning Multimedia Using the CTL Approach in Thematic Learning for Class IV Elementary School Students. Undiksha Edutech Journal, 8(2), 1.https://doi.org/10.23887/jeu.v8i2.28919.

Guntur, M., Sahronih, S., & Ismuwardani, Z. (2023). Development of Comics as a Mathematics Learning Media in Elementary Schools. Journal of Basic Education Studies, 8(1).https://journal.unismuh.ac.id/index.php/jkpd/article/view/9685/5629.

Handayani, T. (2021). Development of STEM-Based Digital Comic Media to Improve Elementary School Students' Scientific Literacy. Journal of Elementary Education Didactics, 5(3), 737–756.https://doi.org/10.26811/didaktika.v5i3.343.

Hendraningrat, D., & Fauziah, P. (2021). Digital Learning Media for Early Childhood Fine Motor Stimulation. Obsession Journal: Journal of Early Childhood Education, 6(1), 58–72.https://doi.org/10.31004/obsessi.v6i1.1205.

Jundu, R., Nendi, F., Kurnila, VS, Mulu, H., Ningsi, G. P., & Ali, F. A. (2020). Development of contextual-based science learning videos in Manggarai for student learning during the Covid-19 pandemic. Journal of Science Education, 10(2), 63–73.https://doi.org/10.24929/lensa.v10i2.112.

Kanti, FY, Suyadi, B., & Hartanto, W. (2018). Development of digital comic learning media on basic competencies in payment systems and payment instruments for class X IPS students at MAN 1 Jember. Journal of Economic Education, 12(1), 135–141.https://jurnal.unej.ac.id/index.php/JPE/article/view/7642.

Karo-Karo, IR, & Rohani, R. (2018). Benefits of Media in Learning. Axiom: Journal of Education and Mathematics, 7(1).https://doi.org/10.30821/axiom.v7i1.1778.

Laksmi, NLPA, & Suniasih, NW (2021). Development of E-Comic Learning Media Based on Problem Based Learning on Water Cycle Material in Science Content. Scientific Journal of Education and Learning, 5(1), 56.https://doi.org/10.23887/jipp.v5i1.32911.

Magdalena, I., Prabandani, RO, Rini, ES, Fitriani, MA, & Putri, AA (2020). Analysis of Teaching Material Development. Journal of Education and Social Sciences, 2(2), 170–187.https://ejournal.stitpn.ac.id/index.php/nusantara /article/view/805.

Murni, AW, & Yasin, FN (2021). Development of Project-Based Student Worksheets (LKPD) on Water Cycle Material for Class V Elementary Schools. Basicedu Journal, 5(6), 6196–6210.https://doi.org/10.31004/basicedu.v5i6.1696.

Nabilah, S., Pujiastuti, H., Mathematics, P., Sultan, U., Tirtayasa, A., Mathematics, DP, Sultan, U., & Tirtayasa, A. (2023). Systematic Literature Review: Numeracy Literacy in Mathematics learning, Levels, Materials, Models and Learning Media. Scientific Journal of Educational Sciences, 6(4), 2436–2443.https://jiip.stkipyapisdompu.ac.id/jiip/index.php/JIIP/article/view/1448.

Pane, A., & Dasopang, MD (2017). Learning And Learning. Fitrah: Journal of the Study of Islamic Sciences, 3(2), 333.https://doi.org/10.24952/fitrah.v3i2.945.

Permana, J., & Sujana, W. (2021). Social Sciences Learning Application Based on a Contextual Approach. Journal of Educational Research and Development, 5(1), 1–9.https://doi.org/https://doi.org/10.23887/jppp.v5i1.32445.

Qoni'ah, BNT, & Kuntjoro, S. (2023). Development of Learning Media Based on Ispring Suite 9 on Environmental Change Material to Practice Critical Thinking Skills. BioEdu: The Scientific Periodical of Biology Education, 12(2), 356–364.https://ejournal.unesa.ac.id/index.php/bioedu/article/view/47281.

Risma, D., Solfiah, Y., & Satria, D. (2019). Development of Child Protection Educational Media to Reduce Violence Against Children. Journal of Obsession: Journal of Early Childhood Education, 4(1), 460.https://doi.org/10.31004/obsession.v4i1.322.

Sari, RR (2022). Development of an E-module based on Contextual Teaching and Learning (CTL) to measure physics learning outcomes for linear motion material for class X SMA Negeri 2 Lubuklinggau City. Phi Journal Journal of Physics Education and Applied Physics, 3(1), 42.https://doi.org/10.22373/p-jpft.v3i1.11004.

Semadi, YP (2019). Pancasila Philosophy in Education in Indonesia Towards a Nation with Character. Indonesian Journal of Philosophy, 2(2), 82.https://doi.org/10.23887/jfi.v2i2.21286.

Sholeh, M. (2019). Development of Pop-Up Book Media Based on Local Culture, Cultural Diversity of My Nation, Class IV Elementary School Students. Gentala Journal of Elementary Education, 4(1), 138–150.https://doi.org/10.22437/gentala.v4i1.6979.

Siregar, N., Sahirah, R., & Harahap, AA (2020). The concept of an independent learning campus in the era of industrial revolution 4.0. Fitrah: Journal of Islamic Education, 1(1), 141–157.https://doi.org/10.53802/fitrah.v1i1.13.

Sujana, IWC (2019). Functions and Goals of Indonesian Education. Adi Widya: Journal of Basic Education, 4(1), 29.https://doi.org/10.25078/aw.v4i1.927.

Supartayasa, IKR, & Wibawa, IMC (2022). Learning the Water Cycle with Digital Comic Media Based on Tri Hita Karana. Journal of Pedagogy and Learning, 5(1), 127–137.https://doi.org/10.23887/jp2.v5i1.46279.

Widiastuti, NLGK (2021). E-Module with a Contextual Approach to Science Subjects. Scientific Journal of Education and Learning, 5(3), 435.https://doi.org/10.23887/jipp.v5i3.37974.

Wiranata, RA, & Sujana, IW (2021). Development of Student Worksheets Based on Contextual Problem Solving Material on Social Problems for Class IV Elementary School. Journal of Pedagogy and Learning, 4(1), 30.https://doi.org/10.23887/jp2.v4i1.31926.

Zorlu, F. (2021). Evaluation Analysis of the Development of Digital Comic Media in Elementary School Science Subjects. Journal of Information Systems (JASISFO), 7(2).https://jurnal.polsri.ac.id/index.php/jasisfo/article/download/ 3342/1432.