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Needs Analysis : Media Development Genially-Based Interactive Infographics to Improve Student Literacy Teaching Environmental Issues in Junior High School

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A B S T R A C T

This study was motivated by the low effectiveness of conventional learning in improving students' literacy on environmental issues in junior high schools. The learning media used by educators tend to be monotonous and less interactive, thus not suitable for the characteristics of the digital generation. This study aims to analyze the need for developing interactive infographics based on Genially as an innovative solution in science learning. The method used was qualitative descriptive with interview techniques and questionnaire distribution to 5 educators and 100 students at SMP Negeri 16 Palembang. The results showed that educators experienced obstacles in using digital media, low learning interactivity, and difficulty explaining abstract concepts. Meanwhile, students showed high interest in visual media, communicative language, and technology-based learning. Needs analysis showed that the development of Genially-based interactive media is highly relevant for improving science literacy, active participation, and critical attitudes towards environmental issues. In conclusion, Genially-based interactive infographics have the potential to be an effective tool in creating engaging, contextual, and humanistic learning in line with the demands of 21st-century education.

1. Introduction

Technological developments in the 21st century have brought significant changes in various aspects of life, including education. Technology has not only become a tool, but also an integral part of the modern learning process. The use of technology in education has enabled a transformation from conventional learning to more interactive, collaborative, and learner-centered learning. According to Angelia et al., (2022), 21st-century learners are required to have critical thinking, creative, communicative, and collaborative problem-solving skills. To achieve these competencies, the integration of technology in learning is very important, especially

in creating learning experiences that are relevant to real life (Ambarwati et al., 2021).

In the context of school learning, learning media acts as a link between educators and students in transferring knowledge. The right media can help students understand the material more deeply, attract attention, and increase motivation to learn (Alawyah et al., 2024). However, the learning process in schools, especially in science subjects, is still largely dominated by lectures and the use of conventional media such as textbooks. As a result, students are less actively involved, so their understanding of the material has not developed optimally (Putrawangsa & Hasanah, 2022). Therefore, innovation in the development of learning media that suits the characteristics of the digital generation is a necessity.

One form of innovative media that can support interactive learning is interactive infographics. Interactive infographics are visual media that present information in a concise, compact, and interesting manner, with the support of interactive elements such as animations, links, quizzes, or simulations. According to Rusdi et al., (2023), today's students are more interested in visual and interactive information than long, monotonous texts. The use of interactive infographics in learning allows students to explore material independently, connect concepts with real-world phenomena, and reinforce understanding through contextual visualization.

One digital platform that can be used to develop interactive infographics is Genially. Genially is a web-based application that allows educators to design learning media with attractive visuals, dynamic animations, and easy-to-use interactive features (Zamzami & Raharjo, 2024). Through Genially, educators can insert links, videos, quizzes, and interactive simulations that encourage students to be active in the learning process. The resulting media is not only aesthetically pleasing but also encourages collaborative and independent learning in line with the characteristics of 21st-century learning (Yusmar & Fadilah, 2023).

The use of Genially-based learning media has great potential to improve students' literacy on environmental issues. Environmental literacy in the context of science not only includes understanding basic concepts, but also the ability to analyze, evaluate, and make decisions based on evidence. Environmental issues such as climate change, pollution, energy crisis, and plastic waste are real phenomena that are close to the lives of junior high school students. Through interactive infographics based on Genially, these issues can be presented in an interesting, concise, and easy-to-understand manner. For example, material on water pollution can be packaged in the form of data visualization, cause-and-effect animations, and interactive reflections, so that students are encouraged to think critically and take a stance on environmental issues.

However, the development of learning media cannot be done without needs analysis. Needs analysis is a very important first step in designing effective and relevant learning media. Needs analysis includes identifying learning conditions in the field, the difficulties faced by educators and learners, and preferences for the desired form of media (Hardianti, 2023). In the context of developing Genially-

based interactive infographics, needs analysis helps map the gap between ideal learning conditions and actual conditions, both in terms of understanding environmental issues and educators' ability to utilize technology (Zakaria & Mahat, 2025). With accurate needs analysis, the media developed is not only visually appealing, but also capable of improving students' overall science literacy.

Thus, the purpose of this study is to analyze the requirements for developing Genially-based interactive infographics as an important foundation in efforts to improve students' science literacy, particularly regarding environmental issues. The media developed is based on real needs and is expected to provide meaningful, interactive science learning that is relevant to students' lives. In addition, this media is also expected to foster curiosity and critical awareness of environmental issues that occur around students while shaping a young generation that cares about and is responsible for the preservation of the earth.

2. Methodology

The needs analysis in this study used a descriptive qualitative method with interviews and questionnaires. This approach was chosen to obtain an in-depth picture of the problems, needs, and expectations of the research subjects, namely educators and students at SMP Negeri 16 Palembang. This analysis was conducted to identify the actual learning conditions, especially in environmental issues, and to find relevant solutions to improve students' science literacy. The first stage was the analysis of student needs, which began with the documentation of school data, including the number of students who were the subjects of the study, consisting of four study groups with 25 students in each group. In addition, questionnaires were distributed to explore information related to learning difficulties, interests, confidence in expressing opinions, learning styles, and preferences for learning media used in the teaching and learning process.

The next stage was an analysis of educators' needs, conducted through in-depth interviews with five science teachers at SMP Negeri 16 Palembang and data processing from questionnaires. The main focus of the analysis was on educators' competencies, the teaching methods used, and the challenges faced in delivering material on environmental issues. Teacher data was obtained through structured interviews and questionnaires with questions about obstacles in teaching, required learning strategies, and views on the use of technology-based media. Meanwhile, student data was collected through questionnaires focusing on learning experiences, so that the results could be used to design Genially-based interactive learning media that suited the needs and characteristics of the students.

Research Instrument

The interview instrument grid for analyzing educator needs used in this study is shown in Table 1.

Table 1. Educator Interview Instrument Grid

Aspect	Indicator
Issues	• Barriers faced by educators • Students' interest in learning about environmental issues
Teaching media	• Media used by educators in teaching and learning • Use of technology by educators • Effectiveness of the media used • The media used is appropriate for the needs of the students • The media supports mastery of the material
Method	• Methods that are often used • The media used sufficiently supports the skills of the students
Media needed	• Types of media needed by educators • Features expected by educators • Media can be used independently by students

(Krisnatalety et al., 2025)

The interview instrument grid for analyzing educator needs used in this study is shown in Table 2.

Table 2. Questionnaire Grid for Student Needs Analysis

Aspect	Indicator
Learning Problems	• Barriers to students' understanding of environmental issues • Students' confidence in expressing their opinions on environmental issues • Students' knowledge of environmental issues • Students' interest in learning about environmental issues • Students' learning styles in understanding environmental issues material
Teaching media	• Understanding media in the form of pictures and illustrations • Use of media in the form of audio
Language	• Use of audio media • Learning about environmental issues with engaging media
Use of Digital Media	• Use of internet access
Required media	• Students' needs in media use • Interactive media for learning • Accessibility of learning media on environmental issues • Effectiveness of media use • Flexibility of teaching media use

(Krisnatalety et al., 2025)

The interview instrument grid for analyzing educator needs used in this study is shown in Table 3.

Table 3. Questionnaire Grid for Educator Needs Analysis

Aspect	Indicator
Effectiveness of Science Learning	• Effectiveness of science learning in ninth grade junior high school
	• Difficulties faced by educators in explaining environmental issues
Learning Strategies	• The need for learning strategies that can increase student participation
Learning Media	• Educators' challenges in finding digital media that suits the characteristics of learners
	• Educators' openness to trying Genially media
Media Evaluation	• Educators' habits in evaluating learning media
Understanding of Material	• Educators' understanding of learning outcomes for environmental issues
Learning Resources	• Educators' need for additional references/guidelines for teaching contextual environmental issues material

(Krisnatalety et al., 2025)

Data Processing Needs Analysis

Data collection used for needs analysis was conducted using interviews and questionnaires. In the analysis of student needs, questionnaires were used, while interviews and questionnaires were used for educators. In this study, the interview results were obtained through dialogue between the researcher and educators at SMP Negeri 16 Palembang, as well as the results of questionnaires distributed to several educators and students at SMP Negeri 16 Palembang. The data obtained was used to analyze the background, analyze needs, and identify problems and solutions in accordance with the circumstances of the students, learning activities, and learning activity requirements to achieve learning objectives. The educator interview instrument can be seen in Table 4, while the student questionnaire used in this study can be seen in Table 5 and the student questionnaire can be seen in Table 6.

Table 4. Educator Interview Instrument

Question	Answer
• What obstacles do you face in teaching environmental issues in the classroom?	
• What are the learning objectives you want to achieve?	
• What media do you typically use in the teaching and learning process of environmental issues?	
• How do you use digital technology in teaching? If yes, what form does its use take?	
• In your opinion, how effective are the media used in helping students understand the material?	
• Do you think the media currently used is appropriate for the needs of the students? Why or why not?	

• In your opinion, what kind of learning media can support students in mastering environmental issues?
• What method do you most often use in teaching environmental issues? Why did you choose that method?
• In your opinion, what kind of media sufficiently supports the development of students' skills?
• In your opinion, what types of media are actually needed in teaching environmental issues?
• What features or elements do you hope to see in media for teaching environmental issues?
• In your opinion, what kind of media should be developed so that it can be used independently by students? Why?

Table 5. Student Needs Analysis Questionnaire Instrument

Question	Assessment				
	1	2	3	4	5
• I have difficulty understanding environmental issues					
• I lack confidence in explaining environmental issues in front of others					
• I quickly forget material about the causes and effects of environmental problems					
• I want to learn about environmental issues in a more enjoyable and easy-to-understand way.					
• I feel that learning about environmental issues has been uninteresting so far.					
• I understand environmental issues better when they are accompanied by pictures, videos, or illustrations.					
• I find it easier to understand environmental concepts when there are interactive media					
• I want to hear explanations about environmental issues directly from experts or public figures.					
• I find it helpful when there are exercises or real-life examples related to environmental issues.					
• I can always easily access the internet					
• I need learning media that can display text, images, and sound.					
• I want to use interactive media such as educational videos or quizzes (digital exercises)					
• I hope there will be learning media on environmental issues that can be accessed via cell phone or laptop at any time.					
• I prefer learning with digital media rather than just reading books.					
• I need learning media that I can use on my own without the help of an educator.					

Table 6. Educator Needs Analysis Questionnaire Instrument

Question	Assessment				
	1	2	3	4	5
• Saya merasa pembelajaran IPA di kelas IX SMP sudah berjalan dengan efektif					

- Saya mengalami kesulitan saat menjelaskan materi isu-isu lingkungan kepada peserta didik
- Saya membutuhkan strategi pembelajaran yang dapat meningkatkan partisipasi peserta didik dalam memahami isu-isu lingkungan
- Saya membutuhkan media pembelajaran yang interaktif untuk meningkatkan minat peserta didik dalam mempelajari isu-isu lingkungan
- Saya yakin media pembelajaran berbasis *genially* dapat meningkatkan pemahaman peserta didik terhadap materi isu-isu lingkungan
- Saya kesulitan menemukan media digital yang sesuai dengan karakteristik peserta didik SMP
- Saya terbuka untuk mencoba media pembelajaran berbasis *genially* dalam proses pembelajaran IPA
- Saya rutin melakukan evaluasi terhadap media yang saya gunakan dalam proses pembelajaran
- Saya memahami dengan baik capaian pembelajaran yang harus dicapai dalam materi isu-isu lingkungan mata Pelajaran IPA
- Saya membutuhkan referensi atau panduan tambahan untuk mengajarkan materi isu-isu lingkungan yang kontekstual

3. Results and Discussion

A. Results and Discussion of Educator Needs Analysis

Based on the results of a needs analysis conducted among educators and students at SMP Negeri 16 Palembang, it was found that learning about environmental issues still faces a number of obstacles in terms of both the methods and media used by educators. The results of a questionnaire distributed to five educators at SMP Negeri 16 Palembang. These questionnaire results provide an overview of the obstacles faced by educators, the media used in learning, the methods applied in learning, and the educators' expectations for the development of media that are more suited to the needs of students, where this learning better supports the anticipation of students to actively participate in learning.

Based on interviews with educators, it appears that most educators face complex obstacles in teaching environmental issues. These obstacles include low student enthusiasm, limited digital media resources, and students' difficulty in understanding abstract concepts. Educators also said that the learning media that have been used so far tend to be conventional, such as textbooks, printed modules, or posters, so they are not fully able to meet the needs of students living in the digital age. Although some educators have utilized technology, its use is still limited to presentation applications, YouTube videos, or Google Classroom, which are considered not interactive enough.

Meanwhile, the results of the questionnaire distribution visualized in the diagram reinforce the findings from the interviews. The data shows that learning

effectiveness is at a relatively low level of 54%, as seen in Figure 1, indicating that the existing media and strategies are not yet optimal in helping students achieve a deep understanding. However, other aspects such as learning strategies (93%), learning resources (92%), and learning media (90%), as shown in Figure 1, received high percentages. This indicates that educators have sufficient variety in strategies and resources, but their implementation is still constrained by the use of inappropriate media, resulting in suboptimal learning for students.

Meanwhile, media evaluation showed results of 88% and material comprehension of 88% as shown in Figure 1, indicating that although the media used can be helpful, its nature is still limited and does not encourage maximum active student engagement. The results of the educator interviews also confirm that the existing media are not interactive enough and are still monotonous, thus failing to support the improvement of science literacy and critical thinking skills. From a needs perspective, the majority of educators agree that the ideal learning media are interactive digital-based media, especially those that utilize platforms such as Genially with features such as animation, quizzes, hyperlinks, dynamic graphics, and virtual experiment simulations.

This type of media is believed to help students learn more flexibly, independently, and in line with the characteristics of educators as digital natives. Thus, it is hoped that students' science literacy will increase while fostering awareness of environmental issues. The results of interviews with educators and the distribution of questionnaires show a gap between good learning strategies and resources and the low effectiveness of learning. Educators need media that is more interactive, applicable, and tailored to the characteristics of students, so that learning about environmental issues is not only informative but also transformative. Therefore, the development of interactive infographics based on *Genially* is a relevant solution to support humanistic, contextual learning and encourage student independence in learning.

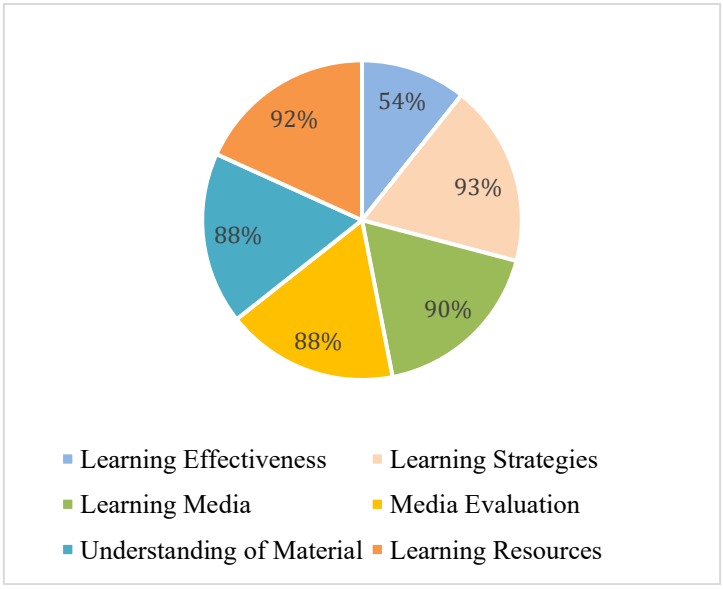

Figure 1. Results of Educator Needs Analysis

B. Results and Discussion of Student Needs Analysis

The questionnaire was distributed to obtain an initial overview of the learning conditions and the students' needs regarding the development of learning media, particularly interactive infographics based on Genially for environmental issues. Figure 2 illustrates the five main aspects studied, namely learning problems, teaching media, language, use of digital media, and required media. Each aspect was analyzed to determine the extent of students' needs and readiness for the learning media innovation to be developed. The issue aspect obtained a percentage of 65.12%, as shown in Figure 2. This value indicates that most students still experience difficulties in understanding learning materials, especially on topics that are abstract and require visual support to aid in understanding the concepts.

The problems that arise include the limited variety of learning media used by educators, difficulty in understanding long texts, and a lack of interactive opportunities in the learning process. This indicates the need to develop more engaging learning media that can bridge the gap in students' understanding. The teaching media aspect shows the highest percentage, namely 77.10%, as seen in Figure 2. This figure indicates that the majority of students feel it is important to use teaching media that is varied, innovative, and able to attract attention. Students expect media that not only convey information unilaterally, but also provide a more active and enjoyable learning experience. Engaging learning media has been proven to increase students' focus, motivation, and participation during the learning process.

The language aspect obtained a percentage of 76.90%, as shown in Figure 2, which is almost equivalent to teaching media. These results indicate that the use of language in learning media plays an important role in improving students' understanding. The language used must be simple, communicative, and appropriate to the cognitive development level of the students. Language that is too technical or complicated can be an obstacle in the learning process, while language that is easy to understand can accelerate the process of conveying information and improve science literacy. The aspect of digital media usage has a percentage of 75.60%, as shown in Figure 2, indicating that students have a fairly high level of readiness in utilizing digital technology in learning. This is in line with the times, where students are accustomed to using digital devices in their daily lives. This condition presents a great opportunity to integrate interactive digital media into learning so that the learning process can be more relevant to the context of real life.

The last aspect, namely the media needed, obtained a percentage of 73.80%, as shown in Figure 2. This figure shows that students really expect learning media that suits their needs. The desired media are interactive, interesting, easily accessible, and able to present material visually and contextually. This expectation indicates a great potential for developing innovative digital technology-based learning media that are suitable for the characteristics of today's students. Based on these five aspects, it is clear that students have a high need for innovation in learning media, especially media that can combine visual, interactive, and digital elements.

The highest percentage in the aspects of teaching media and language shows that the quality of material presentation and delivery methods are key factors in learning effectiveness. Meanwhile, the high level of student readiness in using digital media reinforces the argument that the development of Genially-based interactive infographics is highly relevant and has great potential for implementation. This media can be a solution in overcoming problems in understanding concepts and improving students' science literacy on environmental issues, because it is able to present information visually, interactively, and attractively, as well as increase the active role of students in learning.

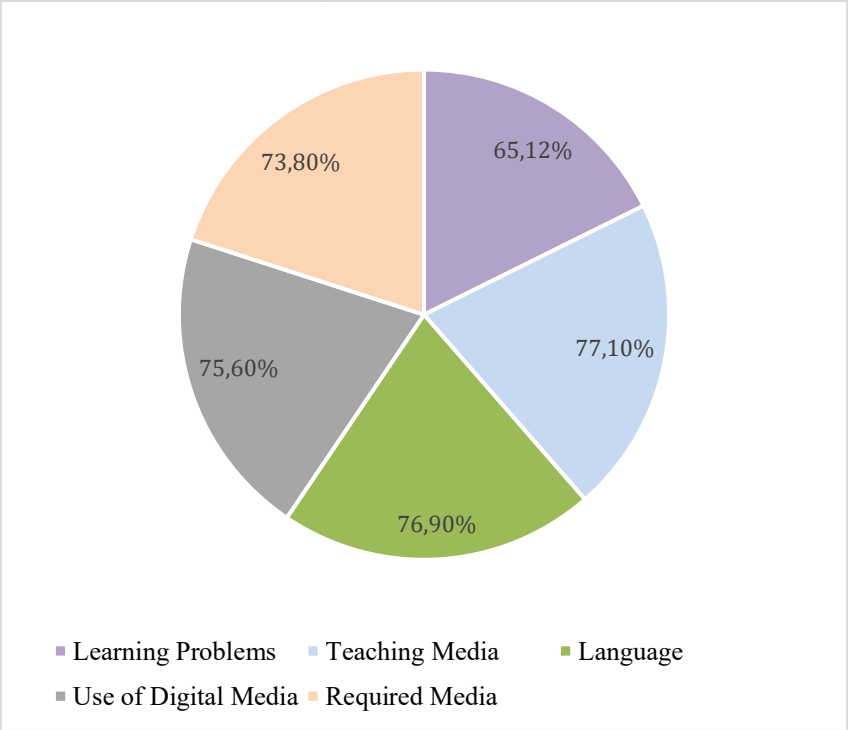

Figure 2. Results of Student Needs Analysis

C. Discussion of Interactive Infographic Media

Needs analysis in the development of Genially-based interactive infographics is an important first step to ensure that the media developed is truly in line with the characteristics of students and the demands of 21st century learning. Based on the results of the needs analysis, it was found that junior high school students need learning media that is not only informative but also interactive, visual, and contextual to environmental issues that occur around students. As shown in Figure 3 regarding environmental pollution, global warming, and the energy crisis, these topics are closely related to the formation of students' ecological awareness and science literacy (Fauziah & Sahlani, 2023)

Environmental pollution, as shown in Figure 3 and explained in the infographic, is a problem caused by the entry of hazardous substances into the ecosystem. Factors such as industrial activity, motor vehicles, and poor waste management are the main sources of environmental damage. In the context of learning, students often find it

difficult to understand the cause-and-effect relationship of this phenomenon because it is presented in an abstract and theoretical manner (Sari & Prasetya, 2025). Therefore, there is a need for interactive visual media such as Genially digital infographics to help students understand the concept of pollution in a concrete way through simulations, animations, and interactivity. This type of media can also foster awareness of environmentally friendly behavior from an early age.

Furthermore, the phenomenon of global warming depicted in the infographic highlights the increase in global temperatures due to greenhouse gas emissions from fossil fuel combustion, deforestation, and industrial activities. These conditions have an impact on global climate change, which directly affects human life and ecosystems. Interviews with educators show that students often only know the term "global warming" without deeply understanding its scientific implications. Genially-based interactive media can be a solution by providing an exploration-based learning experience, where students can observe the effects of global warming through dynamic visualizations and reflective quizzes that encourage critical thinking.

In addition, the issue of energy crisis is also an important part of needs analysis. This crisis reflects society's dependence on fossil fuels and the limitations of non-renewable natural resources. In learning, this topic is often considered difficult because it is multidisciplinary and requires an understanding of physics, economics, and environmental concepts simultaneously. The use of interactive infographics allows educators to explain the concept of the energy crisis in an integrated manner, displaying visual data on the global energy crisis and presenting innovative solutions such as energy development to improve students' understanding and literacy.

Overall, the results of the needs analysis show that the development of Genially-based interactive infographics is highly relevant for improving students' science literacy. This media not only functions as a learning aid, but also as a means of strengthening environmental awareness and developing scientific thinking skills. With attractive visuals and interactive features that allow students to actively participate, Genially can deliver meaningful, contextual science learning that is oriented towards shaping an environmentally conscious character. Thus, the development of this media is expected to be an educational innovation that can address the challenges of science learning in the digital age and shape a young generation that is scientifically literate and responsible for the preservation of the earth.

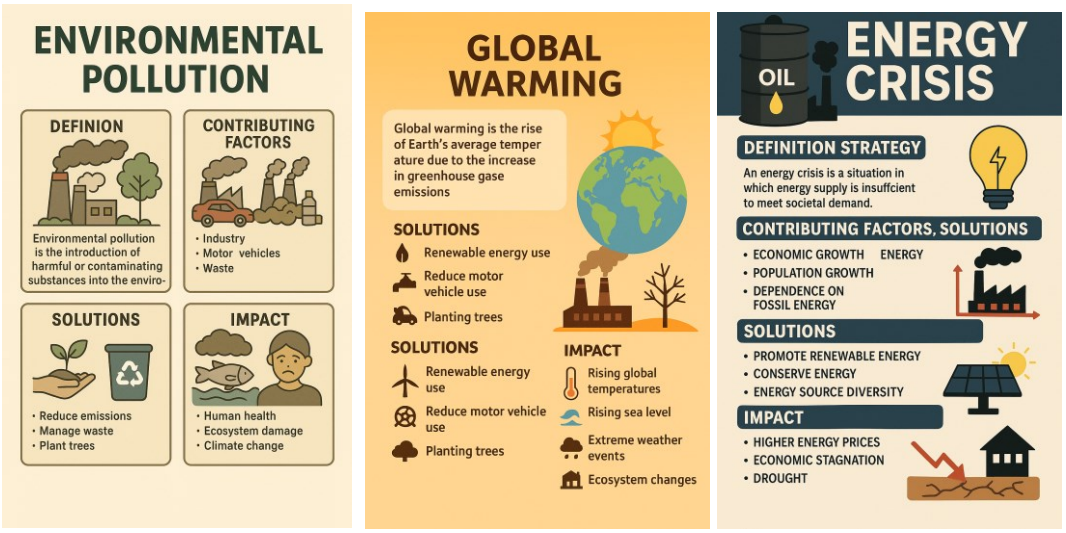

Figure 3. Interactive Infographic Media

4. Conclusion

Based on the results of the study, an analysis of the need for the development of Genially-based interactive infographics shows that the process of learning about environmental issues at SMP Negeri 16 Palembang still faces obstacles in terms of media effectiveness and student engagement. The conventional media used has not been able to foster the interest, creativity, and science literacy needed in 21st-century learning. The results of interviews and questionnaires indicate that both educators and students need interactive, contextual learning media that are in line with the characteristics of the digital native generation of students and are able to improve science literacy. From the results of the study, it can be concluded that the development of Genially-based interactive infographics is considered highly relevant and has great potential for application in science education, especially in environmental issues. This media allows students to learn independently, understand abstract concepts through visualization, and improve critical thinking skills and environmental awareness. This study successfully identified real needs in the field as a strong basis for the next stage of media product development. Thus, this study can be categorized as successful, as it was able to answer the research questions and provide a comprehensive overview of the needs of educators and students. The results serve as an important foundation for creating innovative solutions in the form of effective, engaging digital learning media that is oriented towards improving students' environmental literacy.

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