

Genially as an Innovative Solution: An Analysis of the Need for Interactive Learning Media on the Topic of Viruses to Improve Biology Learning Outcomes

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Abstract

This study aimed to identify the needs and urgency of developing interactive learning media based on Genially for teaching the virus topic in Biology. The research employed a quantitative approach with a descriptive-analytic design. Data were collected through questionnaires distributed to 39 respondents at a public university in Serang, Indonesia and analyzed using descriptive and inferential statistical techniques with the help of statistical software. The results found that majority of the respondents (94.9%) viewed Biology as a difficult subject as they considered the level of memorizing the subject (51.3%) and the abstract nature of the subject (46.2%). Majority of the respondents (100%) faced learning problems when they were not provided with learning media, while 92.3% of the respondents felt the necessity of using interactive media to help understand the subject better. Virus was found to be the most difficult topic among the respondents by 41% of the respondents. Moreover, only 10.3% of the respondents were aware of media development tools like Genially, indicating the low digital literacy of educators. It can be concluded from the above analysis that there is a need to develop interactive learning media based on Genially to improve the learning process of Biology.

Keywords: Interactive Learning Media, Genially, Biology, Virus, Learning Outcomes

INTRODUCTION

The teaching of biology in schools also faces many challenges, especially in relation to abstract biological materials such as viruses. Many surveys revealed that the majority of students perceive biology as a challenging subject due to its conventional and monotonous approach. The application of learning media in biology class by the teachers is restricted only to PowerPoint presentation and books; hence, not fully improving the student learning interest and comprehension. Meanwhile, the students are highly interested in using interactive media that could make the subject engaging through visualization. Nonetheless, the use of interactive digital media such as Genially is not widely utilized in biology education. It reflects the discrepancy between the needs of students in terms of the media and the existence of media itself. Hence, there is a need to develop Genially-based interactive media on viruses.

Learning media is any tool that can be used to convey messages or information in teaching and learning activities, with the aim of attracting students' attention and increasing their interest in learning. Learning media includes materials, tools, and techniques used to support the effective and efficient educational communication process between teachers and students. Thus, the use of appropriate learning media can help educators deliver material optimally, so that students can more easily understand the lesson content (Harahap et al., 2022).

Interactive multimedia is a form of learning media that combines various elements such as text, images, sound, video, and animation in a single computer-based display. This media is an effective alternative because it makes it easier for students to understand the material compared to conventional, monotonous learning. Interactive multimedia-based learning media utilizes information technology to present material in an engaging, interactive, and enjoyable way, thereby increasing student motivation and learning outcomes. The integration of various digital elements in this media also creates a more dynamic learning pattern and supports active interaction between educators and students (Kurniawan & Widiastuti, 2022).

The interactive multimedia developed is interactive, easy to use, and allows students to interact directly with the material. This media summarizes all teacher teaching materials in a more dynamic format than PDF text, making it more engaging, easier to understand, and can stimulate students' imagination and motivation through animated visualizations (Manurung, 2020).

The Genially platform is a web-based application designed to help users create various forms of interactive digital content, such as presentations, infographics, posters, and multimedia learning media. Through the creative features provided including animation, audio, video, and images, Genially provides opportunities for educators to create more interesting, interactive, and dynamic learning experiences for students (Zamzami & Rahardjo, 2024).

METHOD

This research employed a quantitative approach with a descriptive-analytical design. This approach is used to describe the characteristics of the data and test the relationships between variables. The research subject in this study were 39 respondents at a public university in Serang, Indonesia, so that all respondent data is used as a sample and is considered representative of the population as a whole. The research variables include independent (X) and dependent (Y) variables, based on indicators in the survey instrument within the data. Variable measurement uses scales provided in the dataset, such as a Likert scale for assessing perceptions or attitudes, and numerical or categorical scales for demographic data. The research instrument consists of a questionnaire completed by respondents, whose results are then processed into numerical data in an Excel file. This data is classified as primary data because it was obtained directly through the survey process with respondents. Data collection was carried out by distributing questionnaires, then summarized and stored in *inovmeddata.xlsx* as the primary source of information. The analysis of data can be done in two steps. Firstly, descriptive analysis is carried out to describe the respondent

characteristics in terms of frequency, percentage, mean, and standard deviation. Secondly, inferential analysis will be employed to examine the relationships or differences among variables in line with the stated research objectives. The selection of appropriate statistical test depends on the type of data. Analysis will be carried out with the aid of statistical package like Microsoft Excel.

RESULTS AND DISCUSSION

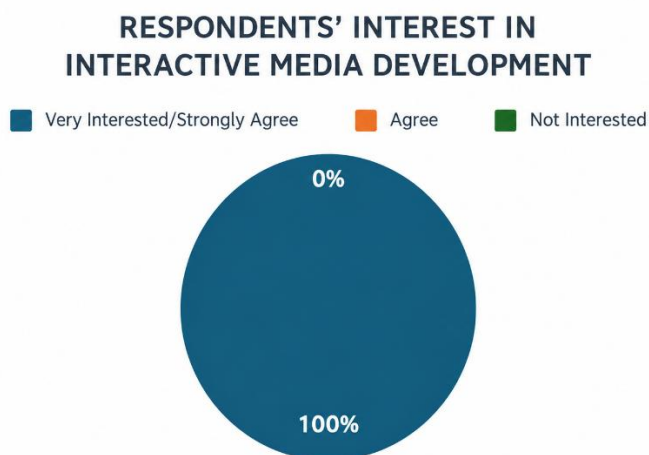


Figure 1. Respondents' Reactions to Interactive Media Development

Table 1. Summary of Key Findings Regarding the Need for Biology Learning Media

No.	Key Findings	Score (%)	Implications/Follow-up Decisions
1	Perception of difficulty of biology subject	94.9% found it difficult	High urgency for learning interventions
2	Difficulty in learning biology without media	100% found it difficult	Learning media is crucial to the teaching and learning process
3	The need for interactive media	92.3% needed	Strong support for media development is a top priority

Table 2. Details of Material Difficulty and Main Factors of Difficulty

Category	Findings/Factors	Percentage of Respondents/Impact	Priority Media Developmen
Most Difficult Material (Focus)	Virus	41% chose this material	This material should be the focus of initial media development
Main Factors of Difficulty	Lots of memorization	51.3% (dominant factor)	The media should provide visualization and interactivity to reduce the burden of memorization
	Abstract	46.2% (significant factor)	

Table 3. Media and Tool Literacy Gap

No.	Key Findings	Score (%)	Implications/Follow-up Decisions
1	The media gap (dominant PPT vs. effective video)	Video is more effective than PPT (implicit)	Media diversification is needed, moving from conventional (PPT) to more visual/animated formats (video/interactive)
2	Introducing (interactive media creation tool)	Genially Only 10.3% know	Socialization and tutorials on interactive media creation tools (Genially or similar) are needed for educators/teachers.

Based on the research results in Figure 1, Table 1, Table 2, and Table 3, all respondents strongly agreed with and supported the use of interactive media in biology learning (figure 1). This demonstrates the importance of developing interactive media in biology learning. In addition to technological advancements brought about by the Industrial Revolution 4.0, the use of technology in learning can also create a more engaging and enjoyable learning environment, thus increasing student enthusiasm (Lewar et al., 2025). Innovation is a change or discovery of new ways of conducting an activity. In learning, innovation has a positive impact on students' understanding of the subject matter. This is because innovation is implemented to overcome difficulties students experience while learning (Situmorang et al., 2022).

The questionnaire results showed that 94.9% of respondents found Biology quite difficult, primarily due to the large amount of material that must be memorized (51.3%) and the abstract nature of the material (46.2%). This is because Biology contains many indirect concepts and material, necessitating the use of tools to clarify these concepts and make them easier for students to understand (Lewar et al., 2025). All respondents (100%) reported experiencing difficulties learning biology without the aid of media. Meanwhile, 92.3% of them admitted to needing interactive learning media as a solution. This is common because media is a form of innovation in learning that aims to address problems that arise during the learning process (Lewar et al., 2025). However, innovation is not limited to the development of ICT-based media but also relates to the use of different learning models or approaches than previously available (Bunari et al., 2024).

In terms of material, viruses were the most difficult topic according to 41% of respondents. This occurs because the material on viruses is included in the field of microbiology, which includes viruses, bacteria, and fungi. All three materials use Latin language and terms that are difficult for students to understand. Many students have difficulty distinguishing viruses and bacteria, including the names and diseases caused by both microbes (Karimah et al., 2024). Students and teachers feel that the material on viruses is too

abstract and difficult to understand because it requires students to memorize Latin, and it is difficult to observe in the laboratory (Situmorang & Ashar, 2025). Furthermore, differences were found in the use of learning media, where the use of PowerPoint presentations (PPT) still dominates, even though video and interactive media are considered more effective because they can enrich the learning experience by providing information in various forms and helping visualize complex concepts (Fadhilla & Saefullah, 2024). Only 10.3% of respondents are familiar with media creation tools such as Genially, so socialization and training for educators is needed. The Genially platform is a web-based application designed to assist in the development of innovative learning media (Zamzami & Rahardjo, 2024). The Genially platform utilizes technology to aid the learning process as a learning tool or medium, as well as to support other teaching methods. Therefore, teachers and educators are encouraged to continuously explore and innovate in creating learning media, especially digital media. The goal is to make the learning process more communication-friendly, engaging, effective, and efficient (Adventyana et al., 2023).

CONCLUSION

Based on the research conducted, it can be concluded that the Biology learning process in schools still faces significant obstacles, particularly in abstract material such as the concept of viruses. Survey results show that the majority of students (94.9%) consider Biology a difficult subject, with the main factors of difficulty being the high memorization requirements (51.3%) and the abstract nature of the material (46.2%). All respondents (100%) agreed that they experienced difficulty in learning without the help of learning media, and 92.3% respondents claimed that they needed interactive media to solve their problem of understanding.

From this scenario, it could be inferred that the conventional media approach using software like PowerPoint was unable to fulfill the requirement of engaging and interactive learning of students. On the other hand, multimedia-based interactive media was considered more effective as it could explain concepts in a dynamic and interactive manner. The most important topic for developing media was virus (41%).

Furthermore, educators' low literacy with digital media development tools such as Genially (only 10.3% of respondents are familiar with it) indicates the need for further training and outreach. Thus, the development of Genially-based interactive learning media on virus material is very necessary to increase students' interest, motivation, and learning outcomes, while creating a more innovative, effective, and enjoyable Biology learning process according to the demands of the digital era and the industrial revolution 4.0.

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