



The Instagram Comics as Learning Media Alternative to Improve Learning Materials on Light Refraction during the COVID-19 Pandemic

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ABSTRACT

In the era of the Covid-19 pandemic, teaching and learning processes were not allowed to be carried out directly or face to face but could be carried out indirectly or remotely. This requires teachers to be able to use existing technology along with the times. One trend that is currently emerging is the use of social media as a learning medium. This study develops one of the learning media using comics with the help of social media, Instagram. This study aims to determine the level of feasibility of Instagram comic-based learning media as an alternative to learning during the Covid-19 pandemic to increase students' learning motivation on light refraction material. The research method used is the research and development method with the 4D model method. The findings of this study are that Instagram comics can be used as an alternative learning media during the covid-19 pandemic to increase students' learning motivation on light refraction material. Based on the stages that have been carried out, the results of the feasibility test of the Instagram comic learning media product are declared very feasibly.

INTISARI

Pada era pandemi covid-19 proses belajar mengajar tidak diizinkan dilaksanakan secara langsung atau tatap muka, melainkan harus dilakukan secara tidak langsung atau jarak jauh. Hal ini menuntut para guru untuk dapat menggunakan teknologi yang ada seiring dengan perkembangan zaman. Salah satu tren yang sedang muncul saat ini adalah pemanfaatan media sosial sebagai media pembelajaran. Penelitian ini mengembangkan salah satu media pembelajaran menggunakan komik dengan bantuan sosial media instagram. Penelitian ini bertujuan untuk mengetahui tingkat kelayakan media pembelajaran berbasis komik Instagram sebagai alternatif pembelajaran di masa pandemi Covid-19 untuk meningkatkan motivasi belajar siswa pada materi pembiasan cahaya. Metode penelitian yang digunakan adalah metode penelitian pengembangan (Research and Development) dengan metode 4D model. Temuan dalam penelitian ini adalah komik instagram dapat digunakan sebagai alternatif media pembelajaran di masa pandemi covid-19 untuk meningkatkan motivasi belajar siswa pada materi pembiasan cahaya. Berdasarkan tahapan-tahapan yang telah dilakukan, hasil uji kelayakan produk media pembelajaran komik instagram ini dinyatakan sangat layak.

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A. Introduction

The COVID-19 outbreak put the world in a heightened state of condition. The World Health Organization, WHO explains that COVID-19 is a communicable disease due to the novel Coronavirus. Most people infected by the virus suffer from mild to moderate respiratory problems. These people can fully recover without specific care treatments. The COVID-19 pandemic insists humans apply physical distancing in the effort to minimize the COVID-19 virus transmission. The pandemic influences all human life aspects, including education. Based on Letter Number 4 the Year 2020 about the Promotion of Educational Policy during the emergency state of COVID-19 virus spread, the Ministry of Education and Culture instructed all educational levels to change their learning process with the online learning process or distant learning.

Online learning or distant learning refers to interactive model learning with the implementation of the Internet and Learning Management System, LMS. Online learning requires an online network to cover massive and broader targets [1]. Wulansari & Manoy [2] explains that distant learning, online learning, or e-learning is a learning approach without direct face-to-face offline classroom meeting. Thus, all learning processes will be different from face-to-face classroom learning. This matter becomes a significant challenge for educators.

In this COVID-19 pandemic, the most important matter to consider is - the learners' motivations. Sutrisno [3] explains that online learning during the pandemic lowers the learning motivation of learners. Thus, their learning results also get lower. Lin et al [4] explain that learning motivation refers to the effort to guide learners to learn and struggle to reach the applied learning objectives by the teachers in the learning process. Saptono [5] explains the influential factor in learners' learning success is - motivation. Motivation significantly influences learning outcomes both directly and indirectly. Naibaho et al. [6] the fluctuation of learning motivation hinders learning development and threatens learning advancement. Thus, accurate management is important to handle learning motivation fluctuation. In this case, teachers have the role to improve learning motivation and learning outcomes by preparing the materials in the form of interesting learning media.

Learning media is important to support learners' learning activities. The applied learning media is useful to mediate the targeted materials. thus, the learners could understand the materials excellently. Umar [7] explains that learning media refer to any applied method and technique as communication media among teachers and learners. Thus, communication and interaction during the learning would be more effective. The media implementation could improve the achievements and motivations of the learners [8]. They are explained that learning media could make learning more interesting, improve learning motivation, and facilitate learners' understanding. Thus, learning media facilitates the learning process to reach the learning objectives.

In this era, social media can be a learning medium. Irwandi [9] found that a percentage of 98% of learners at schools in Bandar Lampung had social media accounts, such as Facebook, Twitter, and Instagram. Then, a percentage of 94% of learners always used the Internet to work on their school assignments. Veygid et al. [10] found that the Instagram application could be an online biology learning because Instagram was a familiar application for the millennial generation, especially Senior High School learners. Rohim [11] explains that Instagram-assisted learning could improve learning motivation and results.

Ahmad Fadillah [12] developed comic learning media to motivate learners to study mathematics. The Research & Development showed that the developed media was reliable and applicable to use as teaching material. In this research, the researchers developed a learning media, comics, for physics. Based on the explanations, the researchers determined the Instagram-based comic learning media's reliability as the alternative of learning media during COVID-19 to improve the learners' learning motivation about light refraction material.

B. Method

This Research & Development study produced a certain product, a learning instrument, with the 4D model. The 4D model has four main stages. They are defining, designing, developing, and disseminating. The applied model was useful to produce an Instagram comic media. In the defining stage, the researchers conducted the pre and post-analysis; the analyses of materials, students, and tasks; and the specifications of learning objectives. From the pre-analysis, the researchers found a lack of learning motivation in the students on light refraction materials during this COVID-19 pandemic. This situation occurred due to the applied online learning and lack of interesting learning methods. In the second stage, the designing stage designed the learning instrument blueprint. The researchers designed the plant or the blueprint in the form of an Instagram-assisted comic. This comic contained materials about light refraction. Then, the researchers would package the comic attractively and upload it via an Instagram account. The third stage, the development stage, dealt with creating a related design of the comic with additional captions.

After designing the comic, the researchers examined the reliability of the comic to be used as an alternative during the COVID-19 pandemic and to motivate learners in learning light refraction. The applied method was a survey by distributing the reliability questionnaire to 50 respondents, consisting of 18 learners and 32 students. In this research, the researchers applied an inclusion criterion for the respondents. The researchers only chose learners and students that studied light refraction. The researchers used Google Form to spread the questionnaire and ensured only one respondent got one questionnaire once. The examined aspects were media, motivation indicator, material, and design. Here are the indicators to assess the product.

Table 1. The Reliability Test Indicators

Aspects	Indicators
Media	The reliability of Instagram as a publishing media for the comic
	The reliability of the Instagram comic as the learning media alternative during the COVID-19 pandemic
	The reliability of the Instagram comic to improve learners' learning motivation
The Indicators of Motivation	The improved persistence and tenacity of the learners after reading the developed comic
	The improvement of learners' learning motivation after treading the developed comic
	The cognitive understanding improvement after reading the developed comic
Materials	The relevance of comic content with the light refraction material
Design	The attractiveness of Instagram comics as a learning media with light refraction material
	The assessment of Instagram comic

In this research, the researchers only provided the development of the product at the third stage of the 4D model. The researchers decided to determine the reliability of the Instagram comic design. In this research, reliability refers to content reliability based on the experts' judgment.

The applied reliability analysis for the developed comic was the ideal standard of deviation. Here are the stages.

- a. Calculating the mean of the assessed-scoring aspects

$$\bar{X} = \frac{\sum x}{n}$$

by:

\bar{X} = mean score

$\sum x$ = score total

n = examiners

- b. Converting the scores into a 4-scale score

Referring to the 4-scale score conversion by calculating the ideal mean (M_i) obtained from an equation [13].

$$M_i = \frac{1}{2} (\text{ideal maximum score} + \text{ideal minimum score})$$

After finding the value of M_i , the researchers calculated the ideal standard of deviation with the equation [13].

$$SB_i = \frac{1}{6} (\text{ideal maximum score} - \text{ideal minimum score})$$

c. Determining the assessment criteria

The applied assessment was based on the calculated standard deviation scores with the given formula on the Table 2.

Table 2. The Quantitative-Qualitative Data Conversion Guidelines

Quantitative Score Interval	Category
$X \geq M_i + 1,5SB_i$	Very reliable
$M_i + 1,5SB_i \geq X \geq M_i$	Reliable
$M_i > X \geq M_i + 1,5SB_i$	Unreliable
$M_i + 1,5SB_i > X$	Extremely Unreliable

The researchers converted the equation criteria into a 1-4 scale interval.

$$M_i = \frac{1}{2}(4 + 1) = 2,5$$

$$SB_i = \frac{1}{6}(4 - 1) = 0,5$$

From the 4-scale assessment criteria, the researchers obtained the research assessment criteria in Table 3.


Table 3. The Quantitative-Qualitative Data Conversion Guidelines for 4-Scale Interval


Quantitative Score Interval	Category
$X \geq 3,25$	Very reliable
$3,25 \geq X \geq 2,5$	Reliable
$2,5 > X \geq 1,75$	Unreliable
$1,75 > X$	Extremely Unreliable

C. Result and Discussion

The results of this research dealt with the Instagram comic design. After designing the comic, the researchers prepared the script in the form of conversation shown in figures and dialog bubbles among the characters. The delivered physics-material conversations were about light refraction. Then, the researchers clarified the materials in the comics with some captions. Here is the design of the developed product.

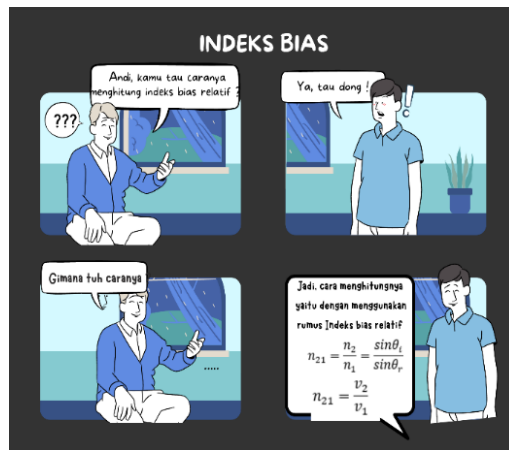
Table 4. The Design of Instagram comic

No	Topics	Comic Design
1	The rainbow phenomenon	<p style="text-align: center;">PELANGI</p>  <p>Caption: A Rainbow usually appears after the rain on a sunny day. The rainbow occurs due to sunray dispersion with its polychrome feature. Then, the light is refracted into monochromatic light. This phenomenon occurs because the ray is refracted by the airdrops. The refracted sun ray produces separated light from the sun. Thus, the reflection is seen in seven colors. Each color is refracted differently and separated.</p>

2	The phenomenon of a visible shallow pool	<p style="text-align: center;">Pembiasan Cahaya pada Dasar Kolum</p>  <p>Caption: The illustration shows the light refraction of a clean and clear shallow pool. When an individual sees the bottom of the pool, the light on the pool goes into our vision. However, the light does not directly go to our vision. The light passes through the water surface so that the light is bent away from the normal line. Thus, human visions catch the refracted light. The extensions of this light</p>
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No	Topics	Comic Design
		create an image of the pool's bottom to be more shallow than the actual depth.

3 Bias Indexes



Caption: The relative bias indexes refer to a ratio of the two absolute bias indexes of two mediums. For example, a light that goes from the air into a glass. These figures mathematically show the relative bias index of air and glass.

In this research, the reliability of the comic design was assessed by 50 respondents. They were students and learners that ever studied light refraction. The examined aspects were media, motivation indicator, material, and design.

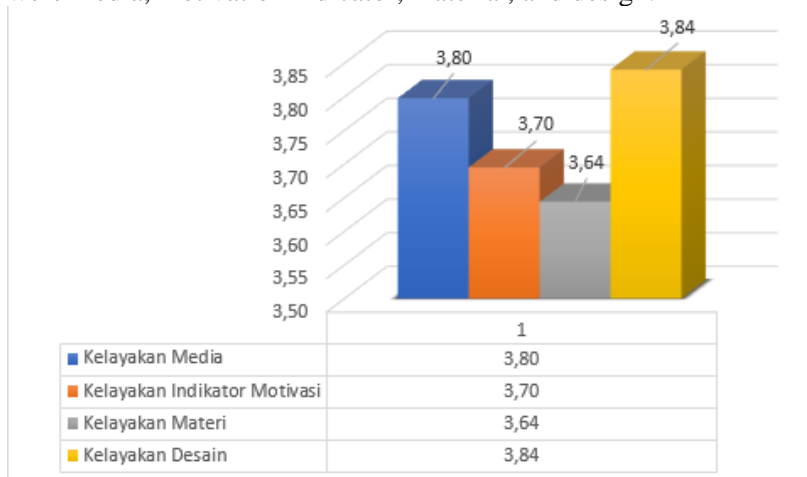


Figure 1. The Graphic of Reliability Result Ratio

Based on the assessment of all aspects, the researchers found the reliability score to be 3.84. The score was based on the examiners' judgment of the developed

product. For the examiners, the developed product was interesting to support the learning process. The other highest aspect was the reliability aspect of the media, 3.80. An examiner explains that the developed product was reliable to be published because many Instagram users were interested in comic content moreover if the content was about education. Fadillah [12] also found that comics were suitable meaning material media. Rohim [11] explains that Instagram-assisted learning could improve learning motivation and results. The third aspect was the motivation with the obtained point of 3.70. The motivation indicator of this aspect consisted of the improved persistence and tenacity of learners after reading the comics about light refraction, the improved learners' learning motivation after reading the developed comic, and the improved understanding after reading the developed comic. Then, the final aspect was material reliability with the obtained point of 3.64.

The examiners suggested the researchers' design materials with many variations. Thus, the researchers revised the design by considering the shadows, the color gradation, the illustration, and many other aspects. In general, the examiners suggested the researchers develop the product design.

The reliability test showed that the Instagram comic as learning media was reliable. Therefore, the researchers continued the production and publication processes in a wider scope. The researchers expect the developed product could be the alternative to improve learners' learning motivation during the COVID-19 pandemic.

D. Conclusion

Based on the results, the researchers concluded the Instagram-based comic learning media was reliable as the alternative of learning media during COVID-19 to improve the learners' learning motivation about light refraction material. The reliability test showed that the product was reliable.

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