

The Effectiveness of Digital Comic Media to Increase Zakat and Waqf Literacy in Generation Z

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ABSTRACT

The declining levels of zakat and waqf literacy among Generation Z pose a challenge to the development of Islamic philanthropy in Indonesia. Conventional educational methods have not been effective in enhancing this generation's understanding of zakat and waqf concepts. Therefore, research is needed to analyze the effectiveness of using digital comics as a strategy to increase zakat and waqf literacy among Generation Z. This study aims to measure the improvement in Generation Z's understanding of zakat and waqf after exposure to digital comics, as well as evaluate the effectiveness of this medium as a learning tool. The research employs an experimental method with pre-test and post-test, involving a sample of 96 Generation Z respondents. The results show a significant increase occurred in zakat and waqf literacy scores, with an average increase of 35.2% from pre-test to post-test. A total of 91.67% of respondents experienced an increase in scores; this finding implies that digital comics have the potential to be an effective medium. However, this finding must be interpreted with caution given the single-group research design used and the measurement focusing only on short-term retention. Further analysis reveals that digital comics are effective in presenting complex information, aligning with Generation Z's preferences, and enhancing learning enthusiasm. This study also demonstrates that the use of digital comics successfully narrows the comprehension gap among respondents, reflecting flexibility towards various initial levels of understanding and different learning styles.

Keywords: *digital comics, generation z, waqf literacy, zakat literacy.*

INTRODUCTION

One of the instruments of Islamic philanthropy that has a role in improving people's welfare if managed optimally is zakat and waqf. The problem and challenge in managing zakat and waqf is the level of literacy in the quality of human resources. The low level of public literacy regarding zakat and waqf is one of the problems that must be solved (Syariah et al., 2023). Evaluation of the zakat and waqf sector must be carried out massively, based on a comprehensive study explaining that the problem of ineffective zakat collection is due to the low understanding of the

Indonesian people regarding zakat and waqf (Utami et al., 2022).

The zakat and waqf literacy campaign will be intensified in 2024 as part of the priority theme of the 2023-2027 National Zakat and Waqf Literacy Roadmap, with the Ministry of Religion, BAZNAS, and BWI as the implementing institutions. The Ministry of Religion is expanding its digital literacy improvement program through several social media such as Instagram, x, TikTok, Facebook and YouTube which can be accessed by the general public through the Literacy of Zakat and Waqf account. The Ministry of Religion presents educational and informative content

about zakat and waqf in various attractive and easy-to-understand formats, such as infographics, short videos, and short articles (Kemenag, 2023).

The results of the BAZNAS analysis revealed that generation X had a zakat literacy index value (born 1965-1979) of 75.83. The zakat literacy index value in generation Y (born 1980-1995) was 75.95, an increase of 0.12 from the previous generation and in generation Z (born 1996-2012) the zakat literacy index value was 73.92, of course this figure is the lowest of the two previous generations, both basic knowledge and advanced knowledge and the overall ILZ value. The zakat literacy index value in generation Z decreased by 2.03 from the previous generation. This is a new problem that must be resolved because over time the level of zakat literacy is decreasing (Zaenal et al., 2022).

Increasing zakat and waqf literacy is very necessary for the sustainability of knowledge between generations. Efforts need to be made towards standardization of literacy levels in a generation, including generation Z as one of the largest populations today. Based on the Badan Pusat Statistik (BPS) 2023, generation Z is currently dominating with 27.94% of the total population or around 74.93 million people.

Generation Z as a generation born in the midst of the digitalization era needs maintenance of the level of zakat and waqf literacy. KemenPPPA (2018) stated that generation Z has an instant mindset. This is one of the problems that must be solved. Generation Z has an advantage in the form of easily digesting information that is conveyed, especially information presented in the form of audio visuals, image visualizations and short videos (Nabila et al., 2023).

In the process of maintaining literacy levels in generation Z, the use of learning media plays a very important role. Learning media can

support and determine success in the learning process. Relevant learning media will make it easier for someone to understand information faster and optimize the enthusiasm for learning. Media in the learning process aims to produce effective learning. However, inappropriate and repetitive learning media can trigger boredom (Dewa & Payanti, 2022).

There are various types of media as teaching tools that can be used in improving literacy and the learning process, one of which is graphic media. The most important function of graphic media is to interpret facts and ideas into images that are packaged concisely and compactly. Comics are included as a learning tool in graphic form. In using comics as a learning tool, it can build enthusiasm for learning and can facilitate the process of capturing material and information packaged through image media (Pratiwi & Kurniawan, 2013).

The existence of changes and adaptation to changes in the era that have entered the digital era of technology in learning can use non- printed teaching media (Indariani et al., 2019). The Ministry of Religion issued digital comics through social media accounts for zakat and waqf literacy. The learning method with teaching materials that have been developed in the form of digital comics can facilitate neatly arranged explanations from the real to the abstract, using light material to material that is difficult to understand and in accordance with current conditions that have entered the digital era. Therefore, the use of digital comics is one of the appropriate steps as a fun learning medium in increasing literacy in generation Z. With the advancement of technology and the internet that is so close to generation Z, it has even become part of their daily lives (Putra, 2016).

LITERATUR REVIEW

Literacy

Literacy originate from the word literacy in Language English has a skilled meaning in read and also writing. The word literacy comes from from Language Latin litter which means letter or letters (Chairunnisa, 2017). According to UNESCO (The United Nations Educational, Scientific and Cultural Organization) literacy is a series of skills real, especially ability intellectual in reading and writing, which is free from source context obtain skills and methods acquire it. Knowledge of meaning literacy is heavily shaped by institutions, academic research, contexts national, cultural and experience that he has (Martinez & Fernandez, 2010). However, the meaning of literacy today is not limited to a person's skill in write and also read but “ has evolved to be seen as equivalent to the anticipated outcome it is expected to produce” so literacy can be interpreted as an implication from ability reading and writing base through sentence written, from unit analysis results Language metalinguistics into structure text oral and written, from consequence human history becomes a consequence philosophical and social education (Sulistiani et al., 2021). In addition, literacy connected to the learning process in the form of arrangement stages for produce new knowledge. If viewed philosophically, this process occurs naturally. from performance the brain in humans to describe the world is wider through a system that is not unpredictable and complex problems (Mc Ginn, 2003).

Zakat Literacy

Zakat literacy is defined as the ability individual for reading, understanding, calculating, and accessing information related to zakat, which has the potential increase awareness in fulfill the obligation of zakat (Baznas, 2019). In effort increase understanding and awareness society about zakat, the National Zakat Collection Agency (BAZNAS) has conducted a study by

formulating index zakat literacy for measure level zakat literacy. Index Zakat Literacy (ILZ) is used for measure level comprehensive and purposeful zakat literacy for evaluate the effectiveness of zakat education programs implemented by various zakat institution. Index zakat literacy as a tool measuring built by two indicator is an indicator understanding basics of zakat and understanding continuation of zakat.

Basic knowledge dimensions in Index Zakat Literacy represents understanding of zakat in context fiqh, which is an important foundation for every Muslim in understand and carry out zakat obligations. For measure level this understanding, BAZNAS has identify a number of variable key that reflects the fundamental aspects of knowledge of zakat jurisprudence. In the dimension base Zakat literacy is developed into five variables, namely general zakat knowledge variables, knowledge of the obligation to pay zakat, knowledge of the 8 Asnaf, knowledge of calculating zakat and knowledge of zakat objects (Zaenal et al., 2022).

Advanced knowledge dimensions in Index Zakat literacy reflects understanding of zakat in economic and legal context, which are important aspects for understand the role and implementation of zakat in system modern socio -economic. This indicator is designed for measure level understanding society about the economic and legal implications of zakat, as well as his role in development social and economic. advanced knowledge dimensions are also described to in five variables, namely, knowledge about zakat institutions, knowledge about zakat regulations, knowledge about the impact of zakat, knowledge about zakat fund distribution programs and knowledge about digital payments in payment of zakat (Baznas, 2023).

Waqf Literacy

Literacy waqf has a definition which means ability individual in reading , understanding , calculating and accessing information related to endowments which ultimately aims to For increase a person's awareness in endowment Literacy endowment done through social media , mass media , electronic media , online media and studies on waqf both in groups or personally for increase literacy society about endowments both from side religious law and positive law, procedures endowment, management endowment and benefits Waqf is both personal worship and social worship at the same time (Fahmi, 2023).

In measure level literacy waqf, there is a tool measuring in the form of index literacy waqf developed by Puskasbaznas in collaboration with the Directorate Empowerment Waqf and Waqf Ministry of Religion of the Republic of Indonesia in 2019. Index literacy waqf as a tool measuring built by two indicator is an indicator understanding basics of waqf and understanding continuation of waqf. Basic knowledge dimensions in index literacy endowment reflect as fundamental aspects related to understanding waqf. In the basic knowledge dimension developed into five variables, namely the variables understanding waqf in general, the obligation to pay waqf, wakif, calculation waqf, object endowment (Astika & Fatwa, 2021). Advanced knowledge dimensions in index literacy endowment is form understanding addition about development from waqf. In the dimension understanding The continuation was also developed into five variables, namely : institution waqf, regulation waqf, impact waqf, waqf program and understanding related to digital waqf (Astika & Fatwa, 2021).

Generation Z

Difference between generation in the reality that occurs becomes a subject that will always exist in human resource development in

each generation new and value of each generation will Keep going experiencing changes as time goes by time. According to Manheim, generation is a structure social in which there is a group of people with the same age and experience same historical (Putra, 2016).

Understanding base about grouping generation is the premise that a generation is a group of individuals who are influenced by events. historical, cultural phenomena that occurred and were experienced in the past their lives as well phenomenon the cause formation collective memory that has an impact in their lives.

Generation z is a generation born between 1997–2012 (Rahmah, 2021). Generally Generation Z is often referred to as the iGeneration or internet generation or generation net, because This generation is always connected to the virtual world and can do a lot. activities by utilizing progress and sophistication existing technology (Duana et al., 2022).

Digital Comics

Comic originate from English language, namely from the word comic, which means something that has a funny nature (Pratiwi & Kurniawan, 2013). Furthermore, the word comic also comes from from the word comic in Language French It means matter new in nature ridiculous and funny (Puspita et al., 2022). Definition comics are a series of description packed animation a series of words as an explanation from the visuals presented, the content picture in the form of form explanation content of the story, so that readers can understand better delivery Contents reading from writer or illustrator is not limited to imagine to characters and background in the picture for enjoyed by everyone from various circles (Pratiwi & Kurniawan, 2013). Along development technology, currently comics are not only presented in conventional book form.

Comics have experienced development is entering into in digital form. In general digital comics are comic formulas that are created and published digitally as a means of communication media. It can be confirmed that digital comics are form revolution from comic simple which has undergone changes from side appearance and arrangement accessible system through gadget (Zakiyah et al., 2022). Song argues that digital comics are one of the popular forms of learning media because of having high interest from its readers. This is supported by the popularity of webtoon which is form digital comics from korea (Rossana et al., 2019)

METHODOLOGY

This study aims to evaluate the effectiveness of digital comics in improving zakat and waqf literacy among Generation Z, using a pre-test and post-test design to measure changes in knowledge before and after exposure to digital comics.

The researchers acknowledge the limitations of this One-Group Pre-Test and Post-Test design. Consistent with the main weakness of this design, the absence of a control group makes it impossible to definitively conclude that the increase in literacy scores was solely due to the treatment (digital comic media). Other confounding factors, such as the learning effect from the pre-test itself (respondents becoming more aware of the topic) or exposure to other information sources that respondents may have accessed during the study period, cannot be excluded as alternative explanations. Therefore, the findings of this study should be interpreted as an indication of change within the observed group, rather than as strong evidence of causality.

In this study, the research uses the Quasi-Experimental method. Quasi Experimental is a form of design that involves at least one group. The research design used in this study is One

Group Pre-Test and Post-Test Design. One Group Pre- Test and Post-Test Design is a research design that involves one group of subjects who are observed before being given treatment (pre- test), then observed again after being given treatment (post-test).

One Group Pre-Test and Post-Test

Design Scheme

Pretest	Treatment	Posttest
O1	X	O2

Description:

X = Treatment

O1 = Pretest Score

O2 = Posttest Score (Sugiyono, 2019)

The subjects of the study were Generation Z individuals (born 1997- 2012) with a minimum education of Junior High School. In this study, to determine the number of samples by applying the Lemeshow formula, this is because in this study the number of generation z is too large and the number is unknown (Riyanto & Hatmawan, 2020). The following is the Lemeshow formula used in the study:

$$n = \frac{Z_{\alpha}^2 P Q}{L^2}$$

Description:

n = Minimum number of samples required

Z α = Standard value of the distribution according to the value of

$\alpha = 5\% = 1.96$

P = Prevalence of outcome, because the data has not been obtained, 50% is used

Q = 1 – P

L = Level of accuracy 10%

Based on this formula, the following will be obtained:

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.1)^2}$$

$$n = \frac{3.8416 \times 0.25}{0.01}$$

$$n = \frac{0.9604}{0.01}$$

$$n = 96.04$$

Based on these calculations, the number of respondents who became the sample in this study was 96 people. The sample in this study used non- probability sampling and was selected through purposive sampling. The experimental group was given digital comic media about zakat and waqf literacy as a learning medium obtained from zakat and waqf literacy social media accounts. The data collection method used a multiple- choice test instrument on the topic of zakat and waqf literacy. This test was given to participants through a pre- test and post-test. It is important to note that this test was created based on pre-determined zakat literacy variable indicators and waqf literacy variable indicators. In addition, secondary data from digital comics were used as supporting data. The test instrument was validated through validity and reliability tests (using Cronbach's Alpha). A total of 32 multiple-choice questions were used for the pre-test and post-test. This instrument was developed to test how the use of digital comics affects zakat and waqf literacy skills in generation Z. Then the data was analyzed using statistical tests, namely the normality test (Kolmogorov-Smirnov or Shapiro- Wilk) and the Wilcoxon Signed Rank Test (because the data was not normally distributed).

This study tests how digital comics can help improve zakat and waqf literacy. Digital comics were chosen because they are expected to encourage Generation Z to learn while enjoying the learning process, considering their characteristics as digital natives. The experimental procedure involved a pre-test (15-20 minutes) followed by exposure to digital

comics (15-20 minutes), and ending with a post-test (15-20 minutes). The resulting data were analyzed using descriptive statistics (individual scores, mean, median, mode) and inferential statistics (Wilcoxon Signed Rank Test because the data was not normally distributed). This study aims to evaluate the effectiveness of digital comics in improving zakat and waqf literacy among Generation Z, using a pre-test and post-test design to measure changes in knowledge before and after exposure to digital comics.

RESULTS AND DISCUSSION

The researcher has successfully collected a series of data obtained from a number of respondents. The data includes information on the age distribution of the participants, professions and learning methods that have been undertaken, the distribution of respondents by age is quite varied. Generation Z is the generation born in 1997-2012, currently aged 12-27 years. The age distribution in this study is as follows:

Respondent Age Distribution

Age	Respondent
12-15 Tahun	3 Person
16-19 Tahun	55 Person
20-23 Tahun	37 Person
24-27 Tahun	1person

The age distribution of each respondent obtained several professions as follows Respondent Profession.

Profession Respondent

Profession	Respondent
Students	56 Person
College	27 Person
Worker	13 Person
Total	96 Person

The dominance of student respondents in this study can be explained by several factors. The accessibility of time for respondents is more flexible in conducting research and allows efficient data collection and educational interventions in this age group has the potential to have a long-term impact on future zakat and waqf practices. The inclusion of students and workers in the research sample provides an important additional dimension. The involvement of students allows for the exploration of a more complex understanding of zakat and waqf, and how this understanding develops along with increasing formal education. Meanwhile, the participation of respondents who are already working provides valuable insights into the practical implementation of the concept of zakat and waqf in the context of a more mature professional and financial life.

Teaching Methods at Educational Institutions that Have Been Undergone

Methods At	Respondents
Educational Still Using Conventional Media	6 Person
Already Using Digital Media	90 Person

Based on the data obtained, most of the respondents with a total of 90 respondents have experienced digital learning methods at the educational institutions they have attended. However, there are still 6 respondents who rely on conventional methods at the institutions they have attended, where teachers are the center of learning by explaining the material verbally and using a whiteboard as the main tool. This

approach has not utilized digital media such as PowerPoint, Google Classroom, Zoom, or other digital learning resources.

The researcher managed to collect a series of data that reflects the level of zakat and waqf literacy among generation Z, both before and after the implementation of education using digital comic media. Before data collection, the pre-test and post- test questions had gone through validity and reliability tests. The results showed that both 32 pre-test questions and 32 post-test questions were declared valid and reliable. After ensuring the quality of the measurement instrument, the researcher then conducted a descriptive analysis of the collected data to obtain a comprehensive picture of changes in the level of zakat and waqf literacy among respondents.

	Pre-test literasi zakat dan waqf	Post-test literasi zakat dan waqf
N	96	96
Missing	0	0
Mean	56.64083	76.59505
Median	60.93750	78.12500
Mode	71.875	87.500
Std. Deviation	17.47831	12.499957
Variance	294.046	156.249
Range	71.875	62.500
Minimum	15.625	34.375
Maximum	87.500	96.875
Sum	5437.200	7353.125

Statistical analysis results shows that 96 respondents participate in this study, pre-test and post-test were conducted to measure zakat and waqf literacy. The average pre-test score was 56.640 (range 15.625- 87.500), while the average post-test increased to 76.595 (range 34.375- 96.875). The pre-test median of 60.937 increased to 78.125 in the post-test. The pre-test mode of 71.875 increased to 87.500 in the post-test.

Then obtained in the pre-test obtained standard deviation score of 17.147, while in the post-test the standard deviation score of 12,499. The decrease in the standard deviation shows that showing the learning method not only

increases general knowledge, but also narrows down gap understanding between respondents. This is supported by a decrease range mark from 71,875 in the pre-test to 62,500 in the post-test. Descriptively, it can be seen improvement mark after use digital comics. After conducting a descriptive analysis Then normality test was carried out. The results of the normality test show mark significance of 0.004 and the post-test data has a value significance 0.000. This is the value significance of pre-test 0.004 and post-test 0.000. Both this value is smaller from level significance of 0.05, indicating that the data is not normally distributed. Because the assumption of normality for parametric tests not met, further analysis will use the non- parametric Wilcoxon test to sample in pairs. This test will evaluate difference level zakat and waqf literacy before and after use digital comics as learning media.

		N	Mean Rank	Sum of Ranks
Post-test literasi zakat dan wakaf - Pre-test literasi zakat dan wakaf	Negative Ranks	0 ^a	.00	.00
	Positive Ranks	88 ^b	44.50	3916.00
	Total	88 ^c		
	Total	96		

a. Post-test literasi zakat dan wakaf - Pre-test literasi zakat dan wakaf
 b. Post-test literasi zakat dan wakaf - Pre-test literasi zakat dan wakaf
 c. Post-test literasi zakat dan wakaf - Pre-test literasi zakat dan wakaf

Based on spss output result in table Ranks it is known that there is no respondents who experienced decline score from pre-test to post- test. However, there were 88 respondents who indicated improvement score from pre-test to post-test. This indicates that 91.67% of respondents experience improvement level zakat and waqf literacy after use digital comics and there were 8 respondents who did not experience a change in score between pre-test and post-test. This indicates there were 8.33% of respondents with level the same and existing literacy The mean rank value is 44.50, which indicates the average rank from improvement score and total increase the overall score is 3916.00.

	Post-test literasi zakat dan wakaf - Pre-test literasi zakat dan wakaf
Z	-8.154 ^b
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
 b. Based on negative ranks.

Based on table Test Statistics The output results of the Wilcoxon test analysis were obtained sig. value 0.000, which means less from α (0.05). This shows that H_0 is rejected and H_a is accepted.

Rejection of H_0 and acceptance of H_a proves that learning through digital comics produce statistically significant changes in Zakat and waqf literacy. There is difference significant increase in zakat and waqf literacy Generation Z before and after using digital comics as a learning medium. This shows success digital comics as learning media innovative and relevant in increase understanding generation Z towards zakat and waqf.

These results are consistent with observations the previous Ranks table, where 88 of the 96 respondents show improvement score. The Wilcoxon test provides proof strong statistics that digital comics are effective increase zakat and waqf literacy among Generation Z. The rise between pre-test and post-test is not only substantial in magnitude (as shown Ranks table), but also highly statistically significant, indicating the effectiveness of the learning methods used in this study.

1. Use Digital Comics Can Improve Zakat and Waqf Literacy in Generation Z

Use digital comics as learning media succeed increase zakat and waqf literacy in generation Z significantly. This increase is

clearly visible from comparison mark pre- test and post-test which shows increase substantial in understanding respondents. This can be proven from the results of the descriptive analysis show that the average pre-test score of 56,640 increased to 76,595 in the post-test. The increase This 19,955 points represents increase quite a large understanding, namely around 35.2% of score beginning. This finding indicates that digital comics can transfer knowledge about zakat and waqf. to Generation Z.

This shows that the use of Digital comics as a learning medium can improve zakat and waqf literacy in generation Z. This can be strengthened by previous research conducted by (Wulandari & Prameswari, 2017) stated that the use of digital comics can improve knowledge and attitudes nutrition in overweight and obese children which shows effectiveness use digital comics. The results of the study showed a significant difference between knowledge and attitude scores nutrition before and after given information nutrition through comic media. The use of comics as a learning medium rated interesting interest and attention students, according to student needs, and capable convey information in a fun way.

2. The Level of Effectiveness of Digital Comic Media for Improvement Zakat and Waqf Literacy Generation Z

For evaluate level effectiveness of digital comic media, several aspects need to be considered in depth. First, the magnitude improvement the average score of 35.2% shows a change in the use of comic media as an increase zakat and waqf literacy. In addition, consistency improvement becomes an important indicator of effectiveness digital comics. With 91.67% (88 out of 96) respondents show improvement score. The fact that the majority big Respondent show improvement understanding confirm consistency effectiveness digital comics as a

tool learning. It should be underlined that there is no respondents who experienced decline score, but there were only 8 people whose scores did not change. This shows that this method has no impact negative to pre - existing understanding.

There is an aspect of equality understanding, which is reflected from decrease in standard deviation and range of scores is factor Supporter others that show effectiveness digital comics in accommodate level zakat and waqf literacy in generation Z. Use digital comics not only enhance general understanding, but also successful narrowing the knowledge gap between respondents. It can be concluded that this media is effective. For increase zakat and waqf literacy. This high level of consistency shows that digital comics can be relied on as a learning method that can be applied to Generation Z.

This is supported by other research conducted by (Fitria et al., 2023) showed the result that the use of effective digital comics in increase literacy scientific students on the topic characteristics organisms. The results of the study showed an increase score literacy significant scientific in class experiments using digital comics compared to classroom control. Although this study focuses on literacy scientifically, the results show potential use digital comics as an effective media for increase literacy in children in general.

Relevance digital comics with characteristics generation z also contributes to the high effectiveness. The style of language and vocabulary used in delivery information or education needs to follow trend current, especially when the target audience is generation Z, because this can be significantly increase effectiveness understanding the message you want to convey. By considering characteristics Generation Z is accustomed to information fast and visual, use relevant and contemporary language can help bridge the gap

gap communication between giver information and recipient message (Victoria & Sutanto, 2023). However, it is important to it is noted 1. that the balance between trends and clarity information must still be guarded. Use style Overly informal language or overuse of slang can detract from credibility message, especially if topics discussed serious or scientific in nature.

CONCLUSION

The effectiveness of digital comics in 2. increasing zakat and waqf literacy is seen from several factors. First, 91.67% of participants (88 out of 96) showed an improvement in their scores. Second, there was a decrease in the standard deviation and score range between the 3. pre-test and post-test, indicating a narrowing of the knowledge gap among participants.

Nonetheless, this study has two main methodological limitations that must be considered when interpreting the findings. First, as mentioned in the methods section, this study used a one-group pre-test and post-test design without a control group. This weakness makes it difficult to attribute the increase in scores exclusively to the digital comic media, as other confounding factors (such as the pre-test effect or external information exposure) could not be controlled.

Second, the post-test was administered immediately after the treatment (15-20 minutes of comic exposure). This design only measured immediate comprehension or short-term knowledge retention. This study cannot demonstrate whether the increase in knowledge persisted over a longer period, which is one of the primary goals of a literacy program. Therefore, the study's conclusions are limited to the effectiveness of digital comic media for short-term understanding enhancement.

The implication of this research is the potential for digital comics to support the improvement of zakat and waqf literacy among

Generation Z, particularly in providing a rapid Researcher give some suggestions as follows: For future research, it is highly recommended to use a more robust research design to overcome the limitations of this study. Employing a quasi-experimental or true experimental design with a control group (e.g., comparing a group using digital comics with a group using conventional learning media) would be invaluable in isolating the true effect of the comic medium.

Future research also needs to measure long-term knowledge retention. This can be done by adding a delayed post-test (e.g., 2 weeks or 1 month after the treatment) to assess whether the acquired knowledge is truly retained.

Research could explore the effectiveness of digital comics for different age groups or demographics

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