# The Effect of Android-Based Digital Poster Learning Media on Students' Digital Literacy in Ecosystem

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**Abstract:** This research is motivated by the low digital literacy of biology of class X students of SMA Negeri 2 Luwu Timur. This study aims to determine the effect of android-based digital poster learning media on students' digital literacy in ecosystem material. This research is a quasi-experimental study with a Nonequivalent Control Group Design research design. The population of this study was all class X with a sample of 2 classes selected randomly. Which consists of 1 experimental class taught using android-based digital poster media, and 1 control class taught using wordwall-based open the box media. Data collection using a questionnaire given before and after treatment in the experimental class and control class. The results of the hypothesis testing at the digital literacy level showed a significance value of 0.023. This shows a sig value $< \alpha$ (0.05) so it can be concluded that H0 is rejected and H1 is accepted. This means that there is a difference in the influence of digital literacy of students taught using Android-based Digital Poster learning media and wordwall-based Open the Box learning media in class X Ecosystem material.

**Keywords:** Digital literacy; Digital poster; Open the box

## Introduction

The development of information technology has influenced the use of various types of media as aids in the learning process (Siregar et al., 2022). The rapid development of digital technology today has brought significant changes in the world of education, especially in the method of delivering learning materials. Why is that, because according to Auliakhasanah et al. (2023), in the era of the industrial revolution, all forms of information can be obtained quickly anytime and anywhere. Many schools in Indonesia that are still minimal in terms of digital literacy for their students are due to the lack of digital learning media provided to them. One of them is a school in East Luwu Regency, namely SMAN 2 East Luwu, where researchers found that class X students have a very low level of digital literacy. This is due to limited facilities and teaching methods that are still conventional.

According to Hartomo et al. (2024), learning media that is less interactive and interesting can be one of the causes of low scientific literacy in students. Destianingsih (2023) also said that internal factors such as low interest and motivation to learn also contribute to low digital literacy. The results of research by Azmi et al. (2024) in the journal "Assessing the Importance of Digital Literacy as a 21st Century Skill among TVET Educators" state that digital literacy is important to prepare students to face the world of work, the authors identify the main obstacles, such as lack of initiative from teachers, limited tools, and minimal professional development programs. Meanwhile, in the modern era, digital literacy is an important skill that students must have to be able to adapt to developments in the era.

Several references state that digital learning media is very important to improve students' digital literacy, including; According to Ruswan et al. (2024), the use of technology in learning media in elementary schools has a major impact on students' digital skills, helping them develop digital literacy through educational devices

and applications. Meliana et al. (2025) also stated that the use of digital-based learning media can effectively improve students' numeracy literacy skills. Siswoyo et al. (2024) added that the use of interactive multimedia can improve creativity and digital literacy in elementary schools. Rizqiya et al. (2024) showed that digitalization of learning media can improve the digital literacy of grade VII MTs students. Diniyati et al. (2024) stated that the use of digital learning media can improve student literacy in social studies subjects in elementary schools. In other words, learning media is a means of conveying messages or information from teachers to students in carrying out learning (Rahmayanti et al., 2023).

With some of the reference opinions above, it is clear that digital learning media is needed to improve students' digital literacy. According to Bachtiar et al. (2024), mastery of digital literacy allows them to search for relevant information, process data critically, and create quality content. With the development of current technology, teachers' abilities in learning have been greatly assisted by digital technology, access to information can be obtained easily, so that information and implementation of learning are greatly assisted (Fattah et al., 2023). According to Saputra et al. (2024), digital literacy plays an important role in improving critical thinking, communication, and collaboration skills, which have a direct impact on academic achievement. According to Ruswan et al. (2024) said "in the era of the development of information and communication technology, progress that continues to change shows itself through computers and gadgets that facilitate communication between individuals at various levels, both locally and globally". This has an impact on the development of digital literacy of students after using digital-based learning media. As an effort to improve the service and quality of education in Indonesia, since 2015 the government has launched digital literacy as one of the six national literacies developed in the National Literacy Movement (Chairuddin et al., 2022). According to Afifulloh et al. (2023), "digital literacy is an urgent need to be met immediately which is then synergized with education".

Digital literacy according to Paul Gilster as quoted by Dyna Herlina S, is "the ability to use technology and information from digital devices effectively and efficiently in various contexts, such as academics, careers, and everyday life" (Musiin et al., 2020). In line with this development, teachers in schools must also think that literacy is a developing concept, and will have consequences for the use of various digital media in the classroom, school and society (Handiyani et al., 2023).

Digital literacy has several benefits, including; enriching vocabulary, adding new insights and information, improving a person's interpersonal skills, increasing the speed of understanding information, improving verbal skills, improving analytical and thinking skills, increasing focus and concentration skills and making it easier for a person to string together meaningful words and write (Syaifuddin et al., 2022). In addition, digital literacy also includes the ability to access, analyze, evaluate, navigate, search, and produce information effectively and critically through various digital technologies (Feng et al., 2024).

The development of students' digital literacy in school learning is none other than the role of teachers as educators in providing innovative learning media. However, in today's digital era, there are still many teachers who are less skilled in using technology. According to Santoso et al. (2020), teachers who are less skilled in using information technology tend to avoid integrating technology into the learning process, so that students do not get adequate examples or direction in developing their digital literacy. Sa'diyah et al. (2023), said that "Teachers must be able to apply digital technology in order to create innovative learning media that can foster student activity". One of the media that can be used to improve students' digital literacy skills is Android-based digital poster learning media. This media combines attractive visualizations and easy access via mobile devices, so that it can increase students' interest and participation in learning.

Media based on writing and images will be more effective in providing students with an understanding of the material being taught compared to written media alone. Posters are learning media that can contain writing and images at the same time. Darung said that "the main advantage of posters is that they can accelerate students' understanding of material concepts" (Pramesti et al., 2023). One of the digital media that can be used in learning is an Android-based digital poster learning media which is expected to be able to arouse students' enthusiasm for learning. This is in accordance with what Musfiqon (2016) said that "Posters are depictions that are shown as notifications, warnings, or appetite stimulants which usually contain images".

Digital poster media is an electronic poster with a graphic design that can communicate visual messages or information in a form that is not easily damaged. Digital posters are said to be not easily damaged because they are not printed on paper or printed on banners, but digital posters can be read on electronic media that can display digital posters, such as computers, laptops, cellphones, and projectors (Sasmita et al., 2024). Where this digital poster media is easy to make through the Canva application, because it is enough to develop creativity in the Canva application. This poster media is one of the most interesting

learning media that can be seen from various angles (Sasmita et al., 2024).

So that by implementing this android-based digital poster learning media, it is expected to be able to increase students' digital literacy to the maximum and it is hoped that this media will not only help in delivering material, but also encourage students' ability to access and process digital information. Thus, the results of this study can contribute to the development of learning media that support the achievement of 21st century competencies.

To overcome this problem, research was conducted by implementing Android-based digital poster learning media. This media was chosen because of its ability to present information visually and interactively, and is easily accessible via mobile devices. Az' Zahra et al. (Az' Zahra et al., 2021) stated that Android-based interactive posters are very effective in increasing students' interest and understanding of learning materials. In addition, the use of technology-based learning media can also improve students' digital skills (Ruswan et al., 2024).

## Method

### Types of Research

This type of research is a quasi-experiment using the Nonequivalent Control Group Design research design involving two class groups, namely the experimental class and the control class. The experimental class was taught using Android-based Digital Poster media. While the control class in this study was taught using Wordwall-based Open The Box media. The structure of this research design is as follows:

**Table 1.** Research Design Nonequivalent Control Group Design (Sugiyono, 2019)

| Research Class | Pretest | Treatment | Posttest |
| --- | --- | --- | --- |
| Experiment | L1 | X | L2 |
| Control | L3 | Y | L4 |

Information:

X : Treatment in the experimental class with the use of digital poster media based on Android

Y : Treatment in the control class using open the box media based on wordwall

L1 : Digital literacy of experimental class students before being given treatment

L2 : Digital literacy of experimental class students after being given treatment

L3 : Digital literacy of control class students before being given treatment

L4 : Digital literacy of control class students after being given treatment

### Population and Sample

Population all students of class X of SMA Negeri 2 Luwu Timur in the academic year of 2024/2025. There are 2 sample classes, where the first class (class X1) with 34 students who were given treatment using digital poster media and the second class (class X2) with 33 students who were given treatment using open the box media based on wordwall, where the sample was selected using the Cluster random sampling technique, namely a sampling technique in which certain groups or clusters are randomly selected to be samples.

### Instrument

The instrument used is a questionnaire (Self-Assessment). Where this questionnaire is used to measure respondents' self-perception of their digital abilities. This questionnaire was distributed before and after the treatment was given to the experimental class and the control class. Consisting of 29 statements related to how much students responded to the digital literacy obtained before and after the learning media was given. The following is a table of components and indicators used in the questionnaire used to measure students' digital literacy.

**Table 2.** Components and Indicators of Digital Literacy Questionnaire

| Component | Indicator | Number of Statements | Questionnaire Statement Number |
| --- | --- | --- | --- |
| Aspects of Digital Skills | Student responses regarding skills in using media | 4 | 1,2,3,4 |
| Material Suitability Aspect | Student responses regarding the suitability of material to media | 5 | 5,6,7,8,9 |
| Visual Design Aspects | Student responses regarding Visual Design from media | 5 | 10,11,12,13,14 |
| Aspects of Learning Engagement and Motivation | Student responses regarding learning involvement and motivation towards the use of media | 5 | 15,16,17,18,19 |
| Aspects of Material Understanding | Student responses regarding understanding of material after using media | 5 | 20,21,22,23,24 |
| Technical Conformity Aspects | Student responses regarding the technical suitability of media use | 5 | 25,26,27,28,29 |

*Data Analysis*

In this study, the collected data will be analyzed using descriptive analysis techniques and inferential statistical analysis. This analysis aims to describe the digital literacy of students obtained. The measurements used by students in determining responses to the questionnaires given use a scale of 1 to 4. The higher the scale chosen by the student, the higher the level of understanding of the use of the media. The following is a measurement scale and categorization of the subjective rating scale questionnaire measurement scores of students presented in the table below.

**Table 3.** Subjective Rating Scale Questionnaire Measurement Scale (Klepsch et al., 2020)

| Score | Category |
|---|---|
| 1 | strongly agree |
| 2 | agree |
| 3 | don't agree |
| 4 | strongly disagree |

The subjective rating scale questionnaire assessment was analyzed quantitatively using the following formula:

$$Questionnaire\ value = \left(\frac{the\ Number\ of\ received\ by\ student}{Total\ score}\right) X\ 100\%) \quad (1)$$

**Table 4.** Subjective Rating Scale Questionnaire Obtaining Categories (Arikunto, 2019)

| Ability Level | Category |
|---|---|
| 80 – 100 | Very good |
| 60 – 79 | Good |
| 40 – 59 | Currently |
| 20 – 39 | Low |
| 10 - 19 | Very Low |

Inferential statistical analysis is used to test the hypothesis, but before testing the hypothesis, a normality test and a homogeneity test are first carried out. The test criteria that the research sample is said to be normally distributed and homogeneous if the sig value> a = 0.05. Conversely, if the sig value <a = 0.05, it can be concluded that the research sample is not normally distributed and homogeneous. While the decision-making provisions in this study use the t-test with the provisions If sig <a = 0.05, then significantly the H1 hypothesis is accepted and the H0 hypothesis is rejected and if sig> a = 0.05, then significantly the H0 hypothesis is accepted and the H1 hypothesis is rejected.

*Procedure Syntax*

The syntax procedure for implementing digital poster learning media based on Android is introduction, then preparation; The teacher explains the learning objectives to be achieved to students. The teacher shares the digital poster media file with students via WhatsApp group. After the poster is distributed, there is a barcode/QR-Code that can be accessed on the poster. After being accessed on each student's Android, a selection of materials will appear. The teacher guides students to click on "ecosystem reading material", then students will be directed to reading material in the form of an ecosystem material module with or without downloading. Furthermore, the teacher develops learning to the next material for students, namely directing students to click on "Ecosystem Learning Video", then students will be directed to the YouTube window and the ecosystem material video can be viewed with or without downloading. Furthermore, the teacher analyzes and evaluates students' knowledge by directing students to click on "Ecosystem Material Quiz", then students will be directed to the Quizizz window which contains a game containing 5 multiple-choice questions to determine students' mastery of the material during the learning process.

The syntax procedure for implementing wordwall-based open the box learning media is an introduction, then preparation; The teacher explains the learning objectives to be achieved to students. The teacher explains the rules of the Open The Box media that will be used as learning media. Each student has the opportunity to choose 1 number in the box provided on the screen using the LCD. The contents of the box are questions. The questions are then answered by reading modules, books or other sources. After they get the answer, each student documents the results of their answers and writes the question number and their respective names, then shares them on the biology whatsapp group page. After the teacher explains how to learn using Open The Box, the teacher then calls students one by one to choose which box number they will open. The teacher guides students to see what material/questions the students get. Furthermore, the teacher instructs each student to find the answers to the questions they get. Furthermore, each student explains the questions and answers one by one in front of the class. After that, the questions and answers they get are documented and sent to the WhatsApp group so that all students can save each question and answer from each other student.

## Result and Discussion

This study involves 2 independent variables, namely android-based digital posters (X1), wordwall-based open the box (X2), and 1 dependent variable, namely digital literacy (Y). The following are the results of the study "the effect of android-based digital poster learning media on students' digital literacy in the ecosystem material of class X SMA Negeri 2 Luwu Timur".

*Descriptive Statistical Analysis*

To find out students' digital literacy before being given treatment, an initial test (pretest) in the form of a questionnaire was first given to the experimental class and the control class. The results of the pretest questionnaire data to determine students' digital literacy can be seen in the following table 5.

**Table 5.** Distribution of Descriptive Statistical Values of Digital Literacy Pretest of Students in Experimental and Control Classes

| Class/Treatment | Number of students (N) | Lowest value | The highest score | Average (mean) | Std. Deviation |
|---|---|---|---|---|---|
| Experiment Class (pretest) | 34 | 34 | 49 | 40.00 | 3.70 |
| Experiment Class(posttest) | 34 | 78 | 95 | 86.38 | 5.15 |
| Control Class (pretest) | 33 | 28 | 48 | 39.79 | 4.96 |
| Control Class (posttest) | 33 | 77 | 91 | 83.67 | 4.36 |

Based on table 5, in the experimental group taught using android-based digital poster learning media (n=34), the pretest results showed the lowest score of 34, the highest 49, with an average score of 40.00 and a standard deviation of 3.70. This means that the range of students' initial abilities is relatively limited (only a difference of 15 points), with the variation of most scores being in the range of ±3.70 points from the average. After the treatment, in the posttest the experimental group's lowest score jumped to 78 and the highest score reached 95, with an average increasing sharply to 86.38 and a standard deviation of 5.15. This indicates a significant spike in performance: not only was there an increase in the average of 46.38 points, but the distribution of scores also widened slightly (variation increased), reflecting differences in post-intervention abilities.

Meanwhile, the control group taught using wordwall-based open the box media (n=33) in the pretest obtained the lowest score of 28 and the highest of 48, an average of 39.79, and a standard deviation of 4.96. The range of scores (20 points) and variation (4.96) indicate a slightly larger spread of abilities than the experimental group before the intervention. In the posttest, the control group recorded the lowest score of 77 and the highest of 91, an average of 83.67, and a standard deviation of 4.36. This means that there was an average increase of 43.88 points, with a slightly reduced variation in scores—indicating more even performance than before.

Comparatively, both groups showed significant average gains post-intervention: the experimental group gained 46.38 points, while the control group gained 43.88 points. The experimental group gained more (a difference of 2.5 points), although the variation in their scores was also slightly larger—the posttest standard deviation was 5.15 compared to 4.36 in the control group—which could indicate differences in individual responses to the method used in the experimental group.

In terms of range, the two groups had very close highest and lowest posttest scores: experimental group (78–95), control group (77–91), indicating that the highest success (peak score) of the experimental group was slightly higher, while the lowest success (baseline posttest score) was almost equal between the two groups.

**Table 6.** Frequency Distribution and Percentage of Digital Literacy Pretest Scores of Students in the Experimental Class and Control Class

| Interval Value | Category | Experimental class (pretest) Frequency | % | Experimental class (posttest) Frequency | % | Control class (pretest) Frequency | % | Control class (posttest) Frequency | % |
|---|---|---|---|---|---|---|---|---|---|
| 80 – 100 | Very good | 0 | 0 | 27 | 79 | 0 | 0 | 24 | 73 |
| 60 – 79 | Good | 0 | 0 | 7 | 21 | 0 | 0 | 9 | 27 |
| 40 - 59 | Currently | 21 | 62 | 0 | 0 | 18 | 55 | 0 | 0 |
| 20 - 39 | Low | 13 | 38 | 0 | 0 | 15 | 45 | 0 | 0 |
| 0 - 19 | Very Low | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Data Amount | | 34 | 100 | 34 | 100 | 33 | 100 | 33 | 100 |

Overall, these data illustrate that the intervention given to the experimental group using android-based digital poster learning media resulted in a slightly greater positive impact than the control class taught using wordwall-based open the box media, where the average increase in the experimental class was higher and the peak score was also superior. This is in accordance with the results of research conducted by Pramesti et al. (2023) where the average post-test increased significantly where digital posters increased visual literacy and digital access for students. In addition, research conducted by Susanto et al. (2021) entitled the influence of poster media on children's creativity and innovation in thematic learning resulted in the average creativity score increasing from 77.9 (experimental pretest) to 78.3 (posttest), while the control class without poster media only increased from 69.3 to 70.4. This proves that the use of digital posters in thematic lessons increases students' creativity and innovation.

Furthermore, to find out the frequency distribution and percentage of pretest and posttest values for digital literacy using Android-based digital poster learning media in the experimental class and word wall-based open the box learning media in the control class, see the table 6.

Based on the table 6, before the treatment (pretest) in the experimental class, the majority of students were in the medium category (21 students; 62%), while low was recorded at 13 students (38%). There were no students in the very good, good, or very low categories. This shows that the distribution is concentrated in the two middle categories. After the implementation of digital poster media, the posttest results showed a significant increase, where 27 students (79%) achieved the very good category, and the remaining 7 students

(21%) were in the good category. There were no students in the medium, low, or very low categories, indicating a spike in achievement to the highest level.

Meanwhile, in the control class, before being given treatment (pretest), the initial conditions were similar, with 18 students (55%) in the medium category and 15 students (45%) in the low category. The other categories remained empty (0%), indicating that the distribution was still centered on low to medium performance. However, after being given treatment, 24 students (73%) reached the very good category, and 9 students (27%) entered the good category. Similar to the experimental class, there were no students in the medium, low, or very low categories—showing significant improvements as well.

Based on the explanation above, both classes showed a clear improvement from pretest to posttest. In the pretest, both tended to have a distribution of students at medium and low levels, with no students in the higher category. After the treatment, digital poster media in the experimental class and open the box media in the control class, almost all students in both classes were at high level performance (very good or good). This improvement was more visible in the experimental class, where 79% of students were in the very good category and 21% in good, compared to the control class which reached 73% very good and 27% good. Overall, the data shows that the use of digital poster media is able to encourage a significant increase in students' digital literacy compared to open the box media.

For more details, here is a comparison diagram of student responses to the questionnaire given after the treatment (posttest) in the experimental class and the control class.
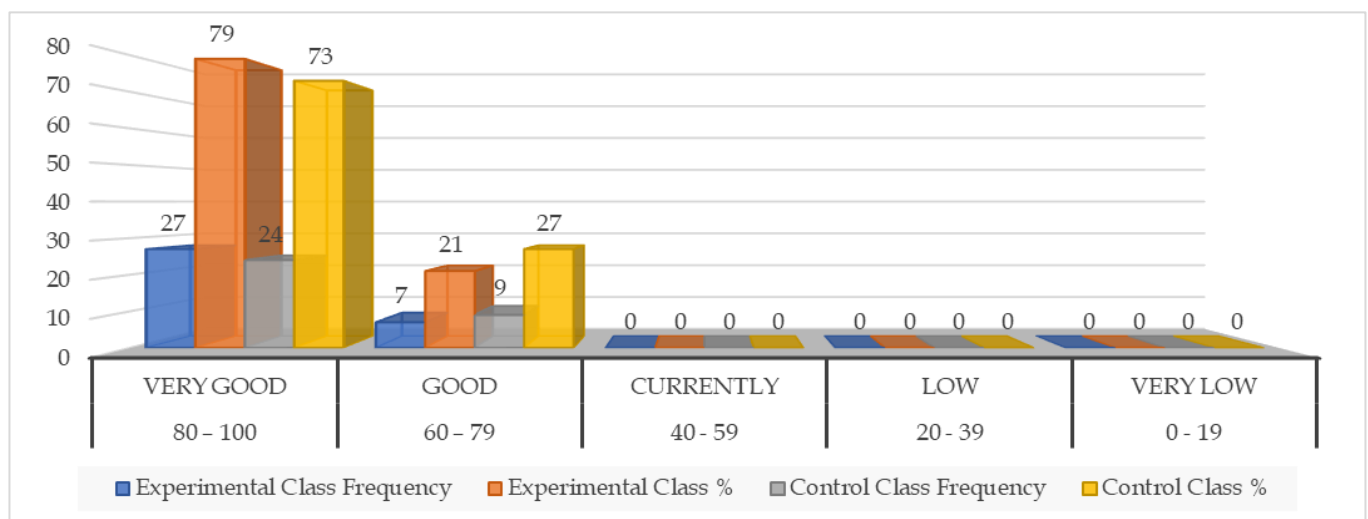


**Figure 1.** Frequency distribution diagram of pretest scores of digital literacy questionnaire of students in experimental class and control class

Based on the diagram above, it can be seen that, although both classes showed high posttest performance, with all students in the top two categories, namely "very good" and "good". However, the proportion of students in the "very good" category in the experimental class was higher (79%) compared to the control class (73%). Conversely, the percentage of students in the "good" category was lower in the experimental class (21%) compared to the control class (27%). This indicates that the intervention or treatment given to the experimental class has a greater positive influence in improving students' digital literacy achievements than the control class. These results are also in line with the results of research by Putri et al. (2024) on the Utilization of digital-based poster media in learning Pancasila Education on the material of norms and rules around us for class VI SDN Menanggal 601 Surabaya. Where the results of the study reported that the use of digital poster media in Pancasila learning was effective in increasing the activity, understanding, and digital literacy of class VI students.

*Inferential Statistical Analysis*

Widodo (2023) in their research journal emphasized that inferential statistics are used to determine the effect of a treatment on a population through sample calculations. This is important in experimental research to test the effectiveness of a particular intervention. Gibbs et al. (2017) explained that inferential statistics are a set of methods used to make population estimates based on samples and to test hypotheses. The hypothesis testing method used is the t-test as explained by Pratomo (2022), that inferential statistics uses hypothesis testing methods, such as the t-test to test whether the results found from the sample can be generalized to a wider population. before carrying out this inferential statistical test, several prerequisite tests are first carried out, namely the normality test and the homogeneity test.

*Normality Test*

Demir (2022) in their article published in the International Journal of Assessment Tools in Education, stated that the normality test is very important to ensure whether parametric statistical techniques such as t-test and ANOVA can be used, because these techniques assume that the data is normally distributed. The normality test is a statistical procedure used to determine whether a data set is normally distributed or not. The results of the normality test will determine whether the average digital literacy of students comes from a population group that is normally distributed or not. Data is normally distributed if the significance value is greater than 0.05

($\alpha > 0.05$), conversely, if the significance value is less than 0.05 ($\alpha < 0.05$) then the data is not normally distributed. The data tested were posttest data from the experimental class and control class, as stated by Widodo (2023), that the posttest data was first tested for normality to determine whether the data was normally distributed so that it met the assumptions of parametric statistics. The results of the post-test data normality test for the experimental class and control class are as in the table 7.

**Table 7.** Normality Test of Posttest Data for Experimental and Control Class

| Class | Kolmogorov-Smirnov[a] | | |
|---|---|---|---|
| | Statistic | df | Sig. |
| Posttest of digital literacy of experimental class | .130 | 34 | .159 |
| Digital literacy posttest control class | .130 | 33 | .168 |

Based on the table above, the results of the normality test using the Kolmogorov-Smirnova method state that the significance data of the experimental class digital literacy is 0.159 and the significance data of the control class is 0.168. The significance data of both class data is greater than ($\alpha > 0.05$), so it can be concluded that the data is normally distributed.

*Homogeneity Test*

Homogeneity test is one of the tests carried out before hypothesis testing. According to Nasar et al. (2024), homogeneity test can be carried out if a randomly distributed data sample has a normal distribution. Homogeneity test needs to be carried out to find out whether the data variance from the experimental class and the control class is the same (homogeneous) or not. As stated by Hidayat (2021) in Nurhaswinda et al. (2025) that homogeneity test is a statistical method used to determine whether the variance of two or more data groups is the same or not. Because if the data is not homogeneous, the results of the hypothesis test can be inaccurate. The homogeneity test uses the test of homogeneity of variance with the help of the SPSS version 25 program. The provisions for making decisions from the data that has been analyzed are carried out by looking at the significance value. Where if the sig α value> 0.05 then the research data is homogeneous but if the sig α value <0.05 then the research data is not homogeneous. The results of the homogeneity test in this study are seen in the following table 8.

Based on the table 8, it can be seen that the calculation of data management for testing the homogeneity of variance test in the experimental class and control class using SPSS for 25, obtained data, namely a sig value of 0.644> 0.05. So it can be concluded that the digital literacy data of students in

the experimental class and control class are homogeneous.

**Table 8**. Homogeneity Test Results for the Posttest of the Experimental Class and Control Class

| Test of Homogeneity of Variances | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| Digital literacy posttest of Experimental Class and Control Class | Based on Mean | .216 | 1 | 65 | .644 |
| | Based on Median | .216 | 1 | 65 | .644 |
| | Based on Median and with adjusted df | .216 | 1 | 57.15 | .644 |
| | Based on trimmed mean | .210 | 1 | 65 | .648 |

*Hypothesis Testing*

After conducting normality test and homogeneity test, the next step is hypothesis testing to determine whether there is an influence of Android-based Digital Poster learning media on students' digital literacy in ecosystem material at SMAN 2 Luwu Timur. This hypothesis testing is carried out using the t-test, with the help of a computer, namely the SPSS version 25 program. The provisions for making data decisions are: If sig <a = 0.05, then the H1 hypothesis is significantly accepted and the H0 hypothesis is rejected or there is an influence of Android-based digital poster learning

media on students' digital literacy in ecosystem material. If sig> a = 0.05, then the H0 hypothesis is significantly accepted and the H1 hypothesis is rejected, meaning there is no influence of Android-based digital poster learning media on students' digital literacy in ecosystem material. The following is the data from the hypothesis test to determine the effect of using Android-based Digital Poster learning media and wordwall-based open the box media on students' digital literacy in ecosystem material in class X SMAN 2 Luwu Timur can be seen in the table 9.

**Table 9.** Hypothesis Test Results Using the t-Test

| Independent Samples Test | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | | | | t-test for Equality of Means | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig.(2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Value | Equal variances assumed | .216 | .644 | 2.32 | 65 | .023 | 2.71 | 1.16 | .381 | 5.05 |
| | Equal variances not assumed | | | 2.32 | 68.82 | .023 | 2.71 | 1.16 | .386 | 5.04 |

Based on the table above, it can be seen that the results of the hypothesis test at the digital literacy level show that the significance value is 0.023. This shows a sig value <α (0.05), so it can be concluded that H0 is rejected and H1 is accepted. This means that there is a difference in the influence of digital literacy of students who are taught using Android-based Digital Poster learning media and Wordwall-based Open the Box learning media on Ecosystem material. The results of this study are also in line with research conducted by Safitri et al. (2022) on the Effect of Health Literacy through Digital Posters on Increasing Knowledge of Breast Self-Examination (BSE) in Female Students of the Faculty of Information Technology, YARSI University. The results of the study stated that there was a difference in influence before and after being given treatment in the form of digital poster media, where the t-test results showed that the sig value. (2-tailed) of 0.000 <0.05 means that the calculated t <from the t table. In addition, Patigu et al. (2024) with the title of his research on Science and digital literacy in science learning stated that digital posters in science learning improve students' science and digital literacy skills. The

results of other studies that show an increase in students' digital literacy after using digital poster media are studies conducted by (Sari et al. (2024) on the digitalization of elementary school students through poster making training with PixelLab showing that digital poster making training (with PixelLab) in elementary schools encourages the process of digitalization and digital literacy of students.

## Conclusion

From the results of this study, it can be concluded that there is a significant and positive influence of the use of Android-based digital poster learning media in the experimental class and wordwall-based open the box media in the control class on students' digital literacy in the ecosystem material of class X of SMA Negeri 2 Luwu Timur. Where the average score obtained increased from before being given treatment and after being given treatment. In the experimental class, the average student score before being given treatment was 40.00, while after being given treatment

it increased to 86.38. Likewise in the control class, where the average student score before being given treatment was 39.79 and after being given treatment it increased to 83.67. In addition, after the hypothesis test was carried out using the t-test, it was seen that the significance value was 0.023. This shows a sig value <α (0.05), so it can be concluded that H0 is rejected and H1 is accepted. This means that there is a difference in the influence of digital literacy of students who are taught using Android-based Digital Poster learning media and Wordwall-based Open the Box learning media on Ecosystem material.

## Author Contributions
S., created the research concept, research procedures, analyzed the data, and wrote the article. Y.H., M.T. and F.D., supervised the writing of the article, reviewed, and validated the research instruments used.

## Conflicts of Interest
The authors declare no conflict of interest.

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