

Application of Chemistry E-Magazine Media to Students' Interest in Learning in Public Senior High School**Gita A Cahyani¹, Indah Wigati^{2*)}, and Ravensky Y Pratiwi³**^{1,2,3}Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia*)E-mail: indahwigati.uin@ac.id**ARTICLE INFO****Article History:**

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ABSTRACT

This study aims to test the effect of e-magazine chemistry media on students' interest in learning buffer solution material. This research uses a quasi-experimental design. The data collection technique used was an interest questionnaire in the form of 20 statements that were tested for the validity of the items, with the results of all statements being valid and a reliability of 0.811, so the questionnaire has a very high level of reliability. The data analysis was done using a t-test at a sig value. (2-tailed) 0.05 parametric statistical test analysis through SPSS software version 25. The experimental class was given treatment using e-magazine chemistry media, and the control class used textbooks. The experimental class's average pre-test and post test scores were 56.18 and increased to 82, while the control class's scores were 55.26 and increased to 65.26. Based on the results of the study, it was shown that the use of e-magazine chemistry was influenced in learning buffer solution material in terms of the data analysis of 0.000. This study implies that e-magazine chemistry can improve students' interest.

INTRODUCTION

Continuous-quality chemistry learning can be achieved through learning media in which students understand the meaning of chemistry concretely and efficiently (Muthoharoh, 2019). Indeed, Ferdian et al. (2018) stated that chemistry learning in many schools needs to be more attractive. Students are tired of learning and have no interest in chemistry lessons, so classroom conditions are less conducive to learning. Therefore, Simatupang (2021) argued that students are sometimes reluctant to study chemistry in more depth as the subject's reputation is difficult. Students' perception that chemistry lessons are difficult causes them to lose interest in learning chemistry.

On the other hand, the buffer solution is one of the most challenging topics discussed in public senior high schools in Indonesia. Students often find learning buffer solution material uninteresting; some even need help understanding it. However, buffer solution is a critical component in learning chemistry, requiring an understanding of principles and mathematical skills to perform chemical calculations. Hence, it is essential to use straightforward material delivery methods to encourage student engagement and prevent rapid boredom (Silitonga et al., 2022).

Furthermore, the information was gathered through an interview with a chemistry teacher at class XI from public senior high school 11 Palembang, who said that the teaching resource used was a textbook with a lecture method. Findings from the interview showed difficulties that impacted students' interest and learning attractiveness. However, findings from student interviews revealed that most students still need more interest in the learning process, causing students not to have a great desire to learn, which can affect their learning outcomes. This is supported by the responses of 73 students of class XI from public senior high school 11

Palembang in the questionnaire of student interest in learning before the study included 20 statement items arranged in 4 indicators of interest in learning to determine the initial interest of students before the application of chemistry e-magazine media. The average response rate was 40.35% on average. So, the level of interest in learning shown by students of class XI from public senior high school 11 Palembang towards chemistry still needs to be higher.

As a consequence of these challenges, efforts must be made to stimulate students' interest in chemistry lessons, as optimal performance requires the application of strategies. Choosing the proper learning media is one of the approaches, allowing students to understand and assimilate the information that educators convey effectively. Applying learning media in the classroom will improve student learning outcomes (Miftah, 2014). Using learning media can foster students' interest in learning new things in the learning material delivered by the teacher so that it can be easily understood (Nurfadhillah et al., 2021).

In addition, interest plays a significant role in learning activities. If students do not have great interest and attention to the subjects being studied, it is difficult to expect that these students will study hard and get good results from their learning (Isnaini et al., 2022). Many factors affect students' interest in learning, both from within and outside the student. Internal factors arise from within the student, while external factors include learning facilities, teacher teaching methods, feedback systems, and others (Karisma et al., 2022). Students interested in learning activities will try harder to learn than those who have an interest (Nugraha et al., 2021). This is in line with Herawati et al. (2022), who argued that interest is significant for learning because students will concentrate more on learning activities if they are interested in learning. Interest will encourage a student's desire to carry out the learning process.

Therefore, incorporating e-magazine media into the chemistry learning process allows students to understand the buffer solution material better. Learning media with e-magazine is based on technology accessed using cellphones, laptops, computers, and other electronic devices that can be adapted according to student needs (Algiffary et al., 2022). The e-magazine or electronic magazine used is a learning media adopted from Ardian's research (2018), "Development of chemistry-magz on buffer solution material," with a media validity value of 0.86, which is categorised as high validity, the value of student interest in the media is 88.50%, but has not been tested for its effect in chemistry learning.

Using previous research relevant to the current study, Masturanda & Linggonilus (2023), in their research entitled *The application of e-magazine of chemistry on atomic structure material to the learning outcomes of high school students at 8 Jambi City*. The study's findings comparing the effect of teaching in conventional classes with learning trials utilising e-magazine showed statistically significant differences. In contrast to other studies, this research focuses on using buffer solution material currently unavailable in the educational environment. Furthermore, Zatika & Fairiza I. (2017) conducted research titled *Effect of the Quality of Mc. Gazine school magazine on reading interest of public senior high school 3 Magelang students*. This study aimed to determine the effect of the quality of the Mc. Gazine school magazine on the reading interest of public senior high school 3 Magelang students. With the results of the study, Mc. Gazine School magazine affects the reading interest of public senior high school 3 Magelang students.

E-Magazine can add insight and make it easier for students to understand the concepts learned and increase the attractiveness or interest of students to take part in learning (Janah et al., 2023). In addition, according to Arief et al. (2021), the e-magazine can help students think more optimally, making it easier to understand chemistry material, especially buffer solutions. E-magazines as a learning media can increase and direct students' attention to generate interest in learning, create a more direct interaction between students and their environment, and increase the possibility of students learning individually according to their abilities and interests.

METHODS

Research Design

The research approach used in this study is a quasi-experimental design, a nonequivalent control group design. The following table details the nonequivalent control group design used in this study.

Table 1. Research Design of nonequivalent control group design

Sample	Pretest	Treatment	Posttest
Experimental	O1	X1	O2
Control	O1	X2	O2

Source: Sugiyono (2018)

Description:

O1 : Pre-test

X1 : Learning by using chemistry e-magazine.

X2 : Textbook learning

O2 : Post-test

Research Target

The research was conducted at public senior high school 11 Palembang City in the odd semester of February 2024. A total of 74 students in class XI became the research sample. The sampling used was simple random sampling. Simple random sampling is a technique of randomly sampling members of the population without regard to the strata contained in the population. The random sampling technique is used in a homogeneous population. In this study, researchers chose the simple random sampling technique because they saw that the condition of class XI students at public senior high school 11 Palembang had the same role in becoming a sample. There was nothing dominant or specialised regarding each student's interest, whether low or high, so using this simple random sampling technique gave students the same opportunity to become sample members. Sampling is done by determining the number of samples to be studied randomly and determining the sample by drawing lots. The paper that comes out first will be designated as an experimental class with chemistry e-magazine learning media. The other class is a control class that uses textbook learning. The research sample was class XI.1, which comprised 36 students as the experimental class, and class XI.5, which was 38 as the control class.

Research Data

In this case, students were asked to fill out a questionnaire, which was then used to collect data for this study. This questionnaire was conducted two times: before and after using a chemistry e-magazine and textbook for learning. This study used questionnaire statements to collect data on students' interest in the learning process, assessed through student interest, student involvement, feelings of pleasure, and student attention.

Research Instruments

This research instrument used a learning interest questionnaire. There are 20 statements forming the research questionnaire, all of which will be assessed as pretest and post-test, which have been tested for item validity with the results of all valid statements, and their reliability of 0.811 has very high reliability. The questionnaire responses are used as the basis for the conclusions drawn in the research conclusions.

Data Analysis

The data were analysed using normality, homogeneity, and hypothesis tests. The paired difference or independent sample t-test, often called the paired sample t-test, is the hypothesis testing tool used in this study. Hypotheses can only be tested after ensuring the data are regular and homogeneous. Researchers used the Kolmogorov-Smirnov test for the normality test, and

for homogeneity, researchers used Levene's test. Statistical analysis was conducted with a significance level of $\alpha = 0.05$. The following steps were taken to reach a decision using the paired t-test:

- Ha is rejected, and H0 is accepted if the p-value is less than 0.05. This shows that chemistry e-magazine media influence the learning interest of grade XI students at public senior high school 11 Palembang on buffer solution material.
- Ha is accepted, and H0 is rejected if the p-value exceeds 0.05. This indicates that the learning interest of grade XI students at public senior high school 11 Palembang is not influenced by chemistry e-magazine media on buffer solution material.

RESULT AND DISCUSSION

The main objective of this study is to ascertain whether the buffer solution material with chemistry e-magazine learning media can increase students' interest in learning. The data used in this study came from a questionnaire that measured students' interest in learning; the questionnaire had 20 statements in 4 indicators. The experimental group was given chemistry e-magazine as learning media, while the control group was given textbooks to read. All classes were treated with problem-based learning or problem-solving. Before the research was carried out, the instrument was to be used as a data source, with the results of the item validity test showing the results of all valid statements and reliability of 0.811, so the questionnaire had a very high level of reliability. Data on student learning interest was obtained from research conducted on two samples, namely class XI 1 as the experimental class and class XI 5 as the control class, and researchers used these two samples to collect data on student learning interest. Data on the pre-test and post-test results of student learning interest in the experimental class XI 1 and control class XI 5 on each indicator can be seen in the table below:

Table 2. Recapitulation of Student Learning Interest Data for Each Indicator Experiment Class

No	Indicators of Student Learning Interest (Experiment Class)	Pre-test	Post-test
1	Feeling Happy	53.30	80.10
2	Students' Attention	53	83
3	Students' Interest	60.40	81.30
4	Students' Engagement	56.10	83.60

Source: SPSS statistic 25

Table 3. Recapitulation of Student Learning Interest Data for Each Indicator Control Class

No	Indicators of Student Learning Interest (Control Class)	Pre-test	Post-test
1	Feeling happy	50.80	63.80
2	Students' attention	56	66
3	Students interest	60	65
4	Students' engagement	55	65

Source: SPSS statistic 25

Based on Table 2 and Table 3 show that the posttest value data for each indicator of student interest in learning in experimental and control classes has a higher value than the pretest value. The average results of pretest and post-test scores from experimental and control classes produced the following data:

Table 4. Data on Pretest and Posttest Results of Student Learning Interest

Class	Pretest Average	Post-test Average
XI 1 (Experimental class)	56,18	82
XI 5(Control Class)	55,26	65,26

Source: SPSS statistic 25

Based on the results of the research data analysis, it was found that the average percentage of questionnaires in the experimental class was 82, while in the control class, it was 65.26. The posttest value of each indicator of student interest in learning is higher than the pretest value. Furthermore, descriptive statistical analysis was carried out to determine the average value per indicator in the class treated with chemistry e-magazine, namely the experimental group and the class treated with textbooks, namely the control class.

Table 5. Descriptive Statistical Analysis of Experimental Class

Descriptive Statistics							
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
Feeling Happy	36	10	10	20	590	16,39	2,555
Students' Attention	36	9	11	20	597	16,58	2,260
Students' Interest	36	9	10	19	594	16,50	2,467
Students' Engagement	36	9	10	19	581	16,14	2,696
Valid N (listwise)	36						

Source: Hasil SPSS 25

Table 6. Descriptive Statistical Analysis of Control Class

Descriptive Statistics							
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
Feeling Happy	38	10	8	18	493	12,97	3,080
Students' Attention	38	8	10	18	542	14,26	2,390
Students' Interest	38	10	8	18	457	12,03	3,183
Students Engagement	38	10	8	18	492	12,95	2,741
Valid N (listwise)	38						

Source: Hasil SPSS 25

Data on student learning interest per indicator in the experimental class has the highest average, namely in the student attention indicator with a value of 16.58, while the lowest average is in the student involvement indicator of 16.14. In the control class, student learning interest has the highest average, namely in the student attention indicator with a value of 14.26, while the lowest average is in the student interest indicator of 12.03.

Before using the t-test for data analysis, a prerequisite test, specifically to assess normality and homogeneity, must be conducted. For testing purposes, the participants were divided into two groups: experimental and control groups. Scores from the pretest and posttest were used to collect data. A significance threshold of 5% (α) was used to determine normality and homogeneity tests. The results of the Kolmogorov-Smirnov normality test can be seen in the table below.

Table 7. Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
Data Source	Statistic	Df	Sig
Experimental Class	0,133	36	0,106
Control Class	0,106	38	0,200

Source: SPSS 25

In Table 7, the experimental class has a value of 0.106, while the control class has a value of 0.200. Therefore, the value of sig. (2-tailed) is more significant than 0.05, which indicates that the data in both categories are typically distributed. The results of the homogeneity test conducted using the Levene Statistics formula are presented in the following table.

Table 8. Homogeneity Test Result

		Levene Statistic	df1	df2	Sig.
Learning	Based on Mean	0,548	1	72	0,462
Interest	Based on Median	0,769	1	72	0,383
Data	Based on the Median and with adjusted df	0,769	1	69,592	0,383
	Based on trimmed mean	0,671	1	72	0,415

Source: SPSS 25

Table 8 shows that the Levene Statistics homogeneity test applied to the experimental and control classes generates a value of 0.462. The data of both groups can be considered homogeneous because the sig. Based on the mean value of 0.462, it is more significant than 0.05. After ensuring the data is homogeneous and normally distributed, the t-test tests the hypothesis. As for the t-test, this study used a paired difference test, which is often called an independent sample t-test.

Table 9. Results of independent sample t-test

Independent Samples Test	Independent 1. Pretest Posttest Experiment	Independent 2. Pretest Posttest Control
Significant A	0,000 0,05	0,000 0,05
Decision	H _a Accepted	H _a Accepted

Source: SPSS 25

Table 9 shows that the significance threshold is 0.05, and the sig (2-tailed) value is 0.000, which is smaller than that. Therefore, H_a is accepted, and it can be concluded that chemistry e-magazine media significantly influences students' interest in learning buffer solution material.

This study's results align with the research conducted by Zatika and Fairiza I. (2017), who found that students' reading interest in public senior high school 3 Magelang had a positive and significant effect. Based on the findings of descriptive research, it can be concluded that school magazines. The study results show that Mc. Gazine School magazine affects the reading interest of public senior high school students 3 Magelang.

By presenting and disseminating content attractively, innovative and creative learning media can arouse students' interest in learning (Prawiro, 2012). A magazine can be presented more interestingly, with illustrative content and logical progression. Various studies reaching the same conclusion regarding the application of social media in education corroborate the idea that students' engagement in the learning process is enhanced once they utilise electronic periodical media. The use of social media in education guides how students can engage in more active learning and has the potential to positively influence student behaviour (Tajussubki & Sifannur, 2019).

E-magazine, a technological device capable of displaying innovative electronic reading displays, can be a learning resource. The emergence of e-magazine due to advances in information and communication technology will impact students' reading habits. In contrast to print media, e-magazines serve as a more practical source for information search and have captivating visuals because they are equipped with attractive images (Risnasari, 2015). In addition, e-magazines are environmentally friendly because of the absence of paper as the primary base material. E-magazines are easier to understand due to the incorporation of animation and images, which increases their appeal and efficacy due to their compatibility with electronic media (Putri, 2017). As e-magazines use more accessible language than textbooks, students may find the subject matter more straightforward to understand (Nurjanah et al., 2014).

E-magazines have the potential to attract readers' interest and capture students' attention with the information contained in each article. In addition, multimedia components such as text accompanied by images can be incorporated into these e-magazines to increase the interactivity and attractiveness of the content and information presented (Kurniawan et al., 2018). Students are interested in learning through e-magazines, which impact their interest due to their aesthetic layout and various features that arouse readers' curiosity about electronic magazines (Rahmawati & Lisdiana, 2023).

Nuraida et al. (2022) stated that e-magazine makes it easier for students to understand the material and makes them happy in learning and adding insight. Using e-magazine learning media can attract students' interest in reading with a display that is implemented digitally, an attractive and colourful design, a variety of images without reducing the impression of a

magazine, a variety of texts, and language selection according to student characters so that the e-magazine design is easy to understand, gives an excellent and not dull impression.

Based on the research that has been done, learning interest is predicted to influence student learning outcomes. Students with a high interest in learning material will likely have high learning outcomes because they can manage their interests and emotions and understand the subject. The existence of good teacher and student relationships and communication will affect their learning interests, and if a student has an interest in learning, it will foster interest in learning and improve student learning outcomes; on the other hand, if they have a low interest in learning, they are likely to get a low interest in learning material (Setiawan et al., 2022).

CONCLUSION AND RECOMMENDATIONS

Research at public senior high school 11 Palembang, class XI students showed a significant increase in interest in learning buffer solutions after using Chemistry E-Magazine as a learning media. Based on the results of the increase in student interest in learning in the experimental class, the indicator of feelings of pleasure of 53.30 increased to 80.10, the indicator of student attention of 53 increased to 83, and the indicator of student interest of 60.40 increased to 81.30. The indicator of student involvement of 56.10 increased to 83.60. The average score was 82 in the experimental group and 65.26 in the control group. Further research is recommended to examine the application of chemistry e-magazine media to student interest in learning other chemistry materials.

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