

The impact of the numbered head together learning model assisted by interactive media on elementary students' natural and social sciences learning outcomes

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Abstract: Indonesian elementary school students' low learning outcomes in Natural and Social Sciences subjects is a problem that needs to be solved. Appropriate learning models and teaching media can improve students' Natural and Social Sciences achievements. Thus, this study aims to evaluate the effectiveness of the Numbered Head Together learning model assisted by interactive media and class students in enhancing learning outcomes in Natural and Social Sciences subjects. This study involved 34 students, 18 of whom were in the control class and 16 of whom were in the experimental class. The study data were collected using a post-test to measure students' learning outcomes. The collected data were analyzed using an independent t-test. The results of this study show that there are differences in the learning outcomes of experimental and control class students; this is evidenced by the results of the t- test, the value obtained by the results on equal variances assumed. The sig value. (2-tailed) obtained in equal variances, assumed to be 0.002, so sig. (2-tailed) = 0.002 < 0.05, so there are differences in the students' natural and social sciences learning outcomes of experimental and control classes. Since the students' learning outcomes in the experimental class are better than those in the control class, this study concludes that the Numbered Head Together learning model assisted by interactive media significantly affects students' Natural and Social Sciences subject learning outcomes.

Keywords: *Interactive media, Learning outcomes, Natural and social sciences, Numbered head together.*

1. Introduction

Everyone naturally evolves and develops through the learning process, where learning has the power to change and shape the individual's behavior patterns and form of contact between humans and their environment that occurs during the learning process (Putrayasa, Syahrudin, & Margunayasa, 2014; Trianto, 2009). Fauziah continued by saying that various factors, both those that come from within the individual, such as intelligence, interests, talents, and abilities, as well as those that come from outside the individual, such as the school environment, family, and media use, can have an impact on learning.

Media use is still limited, and teachers only use pictures from student books to create their learning materials, making learning less interesting and challenging for teachers to inspire students to learn. Teachers have yet to take advantage of recent high-tech breakthroughs in using learning media. Students will become more engaged and likely to retain their education when provided with supportive media. However, the limited and repetitive media use in the classroom hinders student development. This knowledge undoubtedly has a significant effect on children. The current learning system is still conventional. The lack of learning media used by teachers, who still explain the material using textbooks and still use LKS for assignments. According to Sodikin, the traditional education system (teacher teaching) is loaded with learning environments deemed inadequate for the dynamics of the rapid development of science and technology. Teachers must work hard to adapt their lessons to the latest technological developments because the old education system is less tolerant of

creating competent materials (Baharun, 2016; Darmadi, 2017). The conventional learning system has an impact on learning that could be more conducive. For example, when learning takes place, students get bored quickly and prefer to chat in class, do not focus on the teacher's explanation, lack curiosity, fear opinion, and many still need to meet the Minimum Completeness Criteria target. As a result, learning must be organized in such a way, and teachers must prepare various learning materials to bridge learning activities.

The delivery of educational content often involves the use of media, such as interactive media. This media is a very important part of education. The student learning process can greatly benefit from using media in the classroom. In addition, learning media is an important component in the success of the learning process and a crucial basis (Wulandari et al., 2021). To complement learning activities, learning multimedia is needed. When used in conjunction with learning materials that can attract student interest and focus on creating a flexible and varied learning environment, interactive multimedia can assist students in understanding the learning process. Students can also control and rearrange the learning materials according to their wishes. Interactive multimedia can produce effective learning by combining various elements (text, graphics, audio, video, and animation) and using a computer or laptop to illustrate a concept through interesting animations, sounds, and demonstrations. This allows students to develop according to their individual abilities (Bintas & Gelibolu, 2010; Kustandi & Sutjipto, 2011). Hamalik (Kustandi & Darmawan, 2020) states that the use of media in the classroom is a way of teaching and learning that can arouse students' interests and desires, motivate students to learn, and have psychological effects on students. This is in line with the findings of Kustandi and Sujipto (2011), which state that learning media can improve teaching and learning activities by clarifying the meaning of messages so that they can facilitate the achievement of learning objectives.

Interactive media can help students who have learning difficulties. Research by Rahaju Muljo Wulandari and his colleagues found that the results of the learning model using interactive learning media were able to inspire students to improve learning achievement. The use of interactive movies in the learning model was well-received by students (Wulandari et al., 2021), a subtheme of environmental change and the use of interactive media in the habitat of our best friends. Since the information in the theme book is only presented in text form, students must use more critical thinking to understand it. Therefore, interactive video-based learning materials should be created. To attract students' attention, the learning media used is video-based interactive multimedia with distribution through animations that can move and interesting sounds and images. Teachers can also provide learning materials that can be accessed whenever and wherever students are to attract students' interest in participating in learning activities. In addition, children's favorite cartoon characters are used in packaging for the use program and media approach (Nusir et al., 2013). Therefore, the interactive media in this study uses animation to attract students' attention and encourage them to participate in learning activities. Practical applications attract students' attention, are entertaining, and are not monotonous, as are the benefits of interactive movies (Niswa, 2012). From the studies that have been conducted previously, the development of interactive media is only focused on learning outcomes. For this reason, this research is intended to utilize the learning model, namely *numbered heads together* assisted by interactive media to improve the learning outcomes of natural and social sciences elementary school students.

2. Methods

In this study, the research method used was quasi-experimental. Quasi-experimental research is a study that seeks to obtain causal results from researcher treatment. Quasi-experimental research is aimed at one of the two classes with different functions, such as a control class (a class that does not experience special treatment or a class that is only monitored and evaluated as a comparison for researchers by only doing learning as it should). On the other hand, the experimental class (is a class

that is given special treatment in terms of learning models and learning media used (Rukminingsih et al., 2020).

The samples in this study were class IV SD Negeri 4 Manistutu, totaling 18 students, and SD Negeri 6 Manistutu, totaling 16 students, to be used as research samples. The research design used in this study was a *post-test-only Control Group Design*. In this design, there are two groups, each of which is randomly selected. The first group was given treatment, and the other group was not given treatment, according to Table 1.

Table 1.
Research design.

Class	Treatment	Post-test
Experiment class	X1	Y2
Control class	X2	Y2

Description:

Y2 = *Post-test* for experimental class and control class

X1 = Using the *numbered head together* learning model assisted by interactive media

X2 = Not using the *numbered head together* learning model assisted by interactive media

3. Results and Discussion

This research begins by developing media to produce an interactive learning media product based on *Articulate Storyline 3* to facilitate students' learning. The following figures (Figure 1 to Figure 10) show the design of the interactive learning media developed.



Figure 1.
Initial media display.



Figure 2. Usage guidelines.



Figure 3. Main menu.



Figure 4. Animation display.



Figure 5.
Practicum instructions.



Figure 6.
Digital practicum.



Figure 7.
Theoretical explanation.



Figure 8.
Theoretical explanation.



Figure 9.
Theoretical explanation.



Figure 10.
Theoretical explanation.

3.1. Descriptive Statistics and Normality Test Results

The normality test with the *Kolmogorov-Smirnov* method used in this test was calculated using the *SPSS version 25.00* program. The results obtained are shown in Table 2.

Table 2.
Normality test results.

One-sample Kolmogorov-Smirnov test		Experiment	Control
N		18	16
	Mean	82.33	72.88
	St. deviation	7.170	9.521
Most extreme differences	Absolute	0.208	0.148
	Positive	0.208	0.148
	Negative	-0.110	-0.95
	Test statistic	0.208	0.148
	Asymp. sig. (2 tailed)	0.063	0.072

From Table 2 above, the *Asymp. Sig. (2-tailed)* control class obtained is 0.072, and the experimental class obtained is 0.063. If the significance level is more than 0.05, it means that the data comes from a normally distributed population. It can be concluded that the sample comes from a normally distributed population.

3.2. Homogeneity Test

The homogeneity test of the post-test results of the Experiment class and Control class using the *Levene* Technique with the *SPSS version 25.00* program. The obtained output can be seen in Table 3.

Table 3.
Homogeneity test results.

Test of homogeneity of variances		Levene statistic	df1	Df2	Sig.
Value	Based on mean	1.280	1	32	0.266
	Based on median	1.270	1	32	0.268
	Based on the median and with adjusted df	1.270	1	27.043	0.270
	Based on trimmed mean	1.305	1	32	0.262

Table 3 shows that the *sig* value on *Based on Mean* is 0.266. If the significance level of 0.05 is applied, then the *sig* value $0.266 > 0.05$ means that all groups have homogeneous variances.

3.3. Inferential Statistical Test

In the inferential statistical test, a hypothesis test is carried out, which is a procedure used to determine whether to accept or reject the null hypothesis (Payadnya & Jayantika, 2018). Hypothesis testing in this study used the t-test. Based on the results of the t-test calculation using the *SPSS version 25.00* program, the output is obtained according to Table 4.

Table 4.
Independent sample t-test results.

		t-test for equality of means					
		T	Df	Sig. (2tailed)	Mean difference	95% confidence interval of the difference	
						Lower	Upper
Value	Equal variances assumed	3.295	32	0.002	9.45833	3.61094	15.30573
	Equal variancesnot assumed	3.240	27.720	0.003	9.45833	3.47586	15.44080

Advances in science and technology have inspired new initiatives to use technological results in the educational process. Following the progress and demands of the times, teachers must be able to use these instruments. When used in the teaching and learning process, learning media can inspire and motivate students, arouse students' interest in learning, and even psychologically affect students. Students are often confined to a verbalistic learning environment. If teachers use tools, students will become more involved and participate in the learning process, for example, by using recordings. This situation can be avoided. Similarly, children will learn more efficiently if teachers use visual aids such as books, illustrations, maps, charts, movies, models, and demonstration tools. This is because visual information leaves a more substantial impact, is easier to remember, and is more easily understood.

Science lessons are engaging, fun, and related to everyday life. However, in order for science learning to be done correctly and fulfill all learning objectives, students must be able to understand the concept of the material presented by the teacher during the learning process. One of the many problems in classroom learning is the use of media.

Learning strategies and media in science education can improve students' conceptual understanding and creativity. With the help of computer technology, many media, including audio, visual, animation, and graphics, can be combined into one package. Meier argues that images can communicate ideas more effectively than words. One of the multimedia-based learning tools that help students learn science topics is Articulate Storyline 3. Using learning materials based on Articulate Storyline 3 can increase students' learning motivation and impact their achievement or learning outcomes. The need for supporting facilities and infrastructure, either in the form of tools or media, is a prerequisite for learning in the classroom. Communication tools and media are often replaced with educational (learning) media in the scope of education or used interchangeably. Provides optimism that communication relationships will improve through the use of tools in the form of media so that they can function properly and produce the best possible results.

Based on the results of data analysis, it is known that the results on *equal variances are assumed. Sig value. (2-tailed)* obtained in *equal variances, which is assumed to be* 0.002, so *sig. (2-tailed)* = 0.002 < 0.05 so that there are differences in the natural and social sciences learning outcomes of experimental class students who use the *Numbered Head Together Learning Model* assisted by interactive media with control classes that do not use the *Numbered Head Together learning model* assisted by interactive media.

4. Conclusion

Media is a tool used to convey information in learning materials. Content development or delivery can be done using computer-based technology, provided the information or content is stored digitally. The author offers a solution to the problem of elementary school students through the development of interactive media and its application in supporting the *Numbered Head Together* learning model. The results of the data analysis showed that the results on *equal variances were assumed. The sig value. (2-tailed)* obtained in *equal variances assumed is* 0.002, so that *sig. (2-tailed)* = 0.002 < 0.05 so that there are differences in the natural and social sciences learning outcomes of experimental class students who use the *Numbered Head Together Learning Model* assisted by interactive media with the control class that does not use the *Numbered Head Together learning model* assisted by interactive media.

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