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Environmental and cultural-based macromedia flash learning media as a reading solution for the alpha generation

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Abstract

This study addresses the low early reading ability among Alpha generation children, attributed to the lack of suitable media aligned with their technological environment. It aims to examine the effectiveness of Macromedia Flash-based learning media rooted in local environment and culture in enhancing reading skills. A quasi-experimental method with a nonequivalent control group design was applied, involving 200 children aged 7–9 years. Data were collected using an observation checklist and analyzed using SPSS through normality, homogeneity, paired sample t-tests, and independent t-tests. The findings revealed a significant improvement in children's reading skills after using the culturally and environmentally contextualized Macromedia Flash media. The average improvement reached 68%, indicating the media's effectiveness in fostering reading development. The study concludes that integrating familiar cultural and environmental elements into digital learning tools can enhance engagement and outcomes for Alpha generation learners. These results offer practical guidance for educators seeking innovative, context-relevant methods to improve literacy among young children.

Keywords: Initial reading, Learning, Macromedia, Media.

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1. Introduction

Reading is an activity in understanding written texts to obtain necessary information for children. Children that engage in reading activities improve their communication and language abilities. This improvement can be attributed to the fact that reading helps kids broaden their vocabulary, comprehend grammar, and express themselves both orally and in writing. Children's comprehension of the world around them can be enhanced via reading [1, 2]. Activities that involve reading can expand on existing knowledge and relate it to new knowledge, fostering the development of critical thinking abilities. Children's creativity and imagination can also be stimulated by reading. Children can create new worlds, connect with interacting characters, and get pulled up in the adventures of the books they read through reading-related activities.

Children can learn anything by reading [3]. They can learn about history, science, culture, and both fiction and nonfiction through reading. Reading helps kids develop their critical thinking and problem-solving abilities because it requires them to comprehend, analyze, and connect various ideas in books [4]. Through stories describing other people's experiences and feelings, reading also aids children in developing empathy and understanding for others [5]. Because reading has a lasting positive impact on children's cognitive, social, and emotional development, it is crucial to start teaching reading to kids at a young age.

Initial reading and reading comprehension are the two stages that build reading activities [6]. Children learn letters, phonetic sounds, and individual word recognition during the first stage of learning to read, known as initial reading [7]. It entails learning the alphabet, letter sounds, and how to put them together to form simple words. Children who learn to read early on develop the reading foundation necessary for more advanced reading abilities [8]. The capacity to comprehend, evaluate, and interpret a book is known as reading comprehension [9, 10]. Understanding the meaning of words, sentences, and the general context is necessary for the task. The ability to recognize the main idea, summarize the information, predict what will happen next, and draw conclusions from the text read are all examples of reading comprehension skills. These pre-reading exercises aid young readers in deepening their comprehension of the material, expanding their horizons, and making connections between it and prior information.

Reading instruction includes two connected phases: initial reading and reading comprehension. If the initial reading phase is imperfect, students will have trouble understanding what they are reading. Therefore, it is essential to teach beginner readers in the best possible way. The early stages of learning to read are crucial, and new readers need the utmost care [11]. Children start to learn letters, phonetic sounds, and word reading. A solid foundation of initial reading is crucial for the development of further reading abilities. Children will find it simpler to go to the more complex reading stages, such as comprehending sentences, paragraphs, and entire texts, if they have a solid foundation in initial reading [12]. As children increase their vocabulary, learn grammar, and gain a better knowledge of language structure, effective initial reading education also has a favorable effect on the development of their language skills. Initial reading also helps kids learn about their environment since it allows them to learn about a variety of subjects [13, 14]. Children's imaginations and creativity are also stimulated by the reading process as they create new worlds via the stories they read. By placing the utmost emphasis on initial reading education, we make sure that children have a solid foundation to develop further reading skills, broaden their knowledge base, and develop their language abilities—all of which are crucial for their success in school and everyday life.

However, it was reported that Indonesian children's initial reading skills fell into the low category based on the literature study that researchers conducted [15-17]. This is supported by the findings of measurements made of 200 Indonesian children by researchers, which revealed that the average value of the children's initial reading skills in Indonesia was 56.33. This demonstrates the poor initial reading abilities of Indonesian children. These results are also supported by initial observations conducted by researchers in 3 schools, which found that students had difficulty pronouncing letter sound symbols correctly. They often misidentify the sounds that correspond to certain letters. Students also need help saying the same phonemes correctly. They still need to be fully able to differentiate and identify the different sounds in

words. Apart from that, students also need help in reading words correctly. They often mispronounce words or need help deciphering the letters in words. These findings indicate that students' initial reading abilities are relatively low, so there is a need to study this problem.

According to the researcher's findings, a learning process that is not in line with the times causes a poor level of initial reading skills. Alpha generation children are those who are now learning to read. The group of youngsters born between 2010 and 2025 is referred to as the "alpha generation" [18, 19]. They are the first generation to mature and flourish in an advanced digital era and a rapidly changing technological landscape [20]. The low level of beginning reading skills in the Alpha generation, which is the first generation of elementary school today, can be analyzed as a result of the mismatch of the learning process with the times. The way that Generation Alpha interacts with information and learns has changed as they grow and develop in an era of sophisticated digital technologies [21]. Building a strong reading foundation may be hampered by initial reading education that is not customized to the interests and traits of the Alpha generation. From this perspective, it is critical to consider the environment in which the Alpha generation matures and develops [22-24]. They are used to having easy access to social media, electronic devices, and content that is frequently visual and interactive. To boost the interest and motivation of the Alpha generation in learning to read, the initial reading education process needs to be updated with techniques that are more in line with their preferences. Examples of such techniques include the use of technology, gamification, and interactive media.

Addressing these issues, researchers created interactive initial reading materials for the Alpha generation using Macromedia Flash. These materials were focused on the environment and culture. These learning experiences are engaging, varied, and in line with the environment and culture of the Alpha generation since they were made utilizing interactive Macromedia Flash technology. The Alpha generation, who grew up in a time of advanced digital technology, was considered when creating this media in terms of preferences and habits. Additionally, the media is geared around the environment and culture of the Alpha generation. The media's representation of the culture and environment that the Alpha generation may identify with is accurate. It is crucial to consider environment and culture while developing interactive initial reading materials for the Alpha generation to give them a learning experience that is relevant to their everyday life. They can feel interested and driven to improve their reading skills as a result. Experts have evaluated and approved this interactive initial reading resource using Macromedia Flash that is based on environment and culture for use with the alpha generation. However, the research was solely focused on testing the feasibility. It is important to understand how interactive initial reading materials made with Macromedia Flash affect an alpha generation's ability to read concerning their environment and culture.

This research is supported by previous research. Research conducted by Siregar et al. developed interactive media using Macromedia Flash to improve elementary school students' ability to understand fictional stories [25]. The results of the research state that the interactive media Macromedia Flash has been developed, which is feasible and effective for improving elementary school students' ability to understand fiction stories. The research was conducted by Indrakumara, who developed supporting reading materials for grade 4 elementary school students using Macromedia Flash [26]. The results of this research state that supporting reading materials using Macromedia Flash have been developed for grade 4 elementary school students, which can increase students' motivation and enthusiasm for reading. These two studies show that the use of Macromedia Flash to improve the reading quality of elementary school students has begun to be carried out, but improving this quality is still focused on the reading comprehension process (advanced reading). In contrast, few studies have been conducted on improving initial reading, so this research is novel. To increase insight regarding the effectiveness of Macromedia flash media on elementary school students' initial reading. Apart from that, the use of culture- and environment-based Macromedia is a new study that has yet to be researched to improve reading ability.

The formulation of the research problem is whether interactive initial reading media is influenced using environment and culture-based macromedia flash on the beginning reading ability of the alpha generation. Meanwhile, the aim of this research is to ascertain the impact of interactive initial reading media employing macromedia flash that is based on the environment and culture on the alpha generation's capacity. It is crucial to research how interactive learning tools like Macromedia Flash affect the environment and culture of the Alpha generation. A thorough grasp of effectiveness, the impact of technology, environmental and cultural effects, and proper curriculum development will be gained because of this study. The findings of this study can serve as a solid basis for enhancing teaching methods, making the best use of technology, and offering engaging materials for the Alpha generation to help them learn to read.

2. Literature Review

2.1. Environmental and Cultural-Based Macromedia Flash Learning Media

In the continuously evolving digital era, the integration of environmental and cultural contexts into learning media plays a crucial role, especially in facilitating meaningful learning processes for Generation Alpha [27, 28]. Rooted in the understanding that learning occurs not only through the memorization of material but through rich interaction and meaningful experiences, the importance of integrating cultural and environmental elements becomes highly significant. This approach, which supports constructivism, context-based learning, and the theory of multiple intelligences, allows students to build their own knowledge from a foundation of real experiences and cultural relevance [29, 30]. Following the principles of constructivism, where knowledge is constructed through interaction with the surrounding world, interactive learning media with Macromedia Flash based on culture and environment are designed to promote active and participatory learning [31]. Through context-based learning, materials are designed in such a way to engage students in the learning process by connecting the learning materials with the environment and culture familiar to them [32]. This approach is expected to facilitate deeper learning and enhance students' abilities to apply knowledge in various situations. Multiple

intelligences, as an additional theoretical foundation, enrich the learning experience by targeting various learning modalities of students, ensuring that each student can engage and learn in the most effective way for them [33].

Previous research has developed a unique interactive learning media with Macromedia Flash, specifically integrating elements of the Minangkabau culture, one of Indonesia's rich and diverse cultures (the research was conducted on the alpha generation of the Minangkabau tribe in Indonesia). This integration is not only a tribute to the wealth of local culture but also a pedagogical strategy aimed at enhancing engagement and understanding of learning among the alpha generation students of the Minangkabau tribe. By leveraging iconography, language, folklore, and values at the core of Minangkabau culture, this learning media is designed to facilitate a deeper connection between the learning material and the students' life experiences. Researchers believe that by embracing cultural aspects relevant to students' daily lives, the learning process becomes not only more engaging and interactive but also helps students to build a stronger and more personal understanding of the material studied. This approach is particularly important in teaching the alpha generation, known for their high digital connectivity and preference for dynamic and visual learning experiences [34].

In the development of interactive learning media with Macromedia Flash that integrates elements of Minangkabau culture and environment, researchers adopted a structured design methodology to ensure that cultural and environmental content is not only presented but also adapted in a way that supports learning objectives. The selection of cultural content, ranging from iconography, language, to folklore, and Minangkabau values was done through an intensive consultation process with cultural experts, local educators, and representatives of the Minangkabau community itself. The main goal of this approach is to ensure the authenticity and relevance of the learning material to the social and cultural context of the students. Pedagogical considerations in adapting cultural and environmental content into this learning media include how the material can support the development of students' cognitive skills, such as analytical abilities, understanding, and the application of knowledge in real-life situations. Researchers also considered how cultural elements could be used to promote emotional engagement and motivation to learn among students, in line with new generation learning theories that emphasize comprehensive and meaningful learning experiences. The form of Macromedia Flash based on environment and culture includes:

Figure 1.
Macromedia Flash Based on Environment and Culture.

The impact of this approach on Generation Alpha, a group of students who are highly connected digitally and have dynamic learning preferences, is very significant. The unique characteristics of Generation Alpha, including their tendency towards interactivity and visual learning experiences, make the integration of cultural and environmental contexts highly relevant and important [35, 36]. The Macromedia Flash-based learning media we developed not only meets the learning needs of this generation using interactive technology and gamification but also helps them build a deeper connection with their culture and environment, strengthening cultural identity and environmental awareness. The use of interactive learning media with Macromedia Flash based on culture and environment for Generation Alpha of the Minangkabau tribe offers new insights into digital education. This integration not only enhances students' initial reading skills but also strengthens their connection with cultural heritage and the natural environment, preparing students to be critical thinkers and responsible global citizens.

2.2. Initial Reading

Initial reading or initial reading is a critical stage in literacy development, marking the transition from pre-literacy to more complex reading skills [37]. In this study, initial reading is measured through three main indicators: Naming letter sounds, identifying the same phonemes, and reading words. These indicators were chosen because of their representation of the fundamental aspects of developing reading ability, which are important for further mastery of reading skills and literacy. The explanations are as follows :

(1) Naming Letter Sounds
This indicator emphasizes the child's ability to identify and name letter sounds, which is the foundation of all alphabetic writing systems [38]. The fact that initial exposure of students to letters and the sounds they represent significantly affects their reading and writing abilities later. This skill allows children to connect the visual shape of letters with the sounds they produce, the first step in understanding that words consist of sequences of sounds that can be visually represented.

(2) Identifying the Same Phonemes
This indicator focuses on the child's ability to recognize and name the same phonemes in different words, a key component of phonemic awareness. Phonemic awareness, or the understanding that words are divided into smaller individual sound units, plays a crucial role in reading and spelling [39]. Children who can identify the same phonemes in different positions within words tend to have better reading abilities.

(3) Reading Words
The third indicator measures the child's ability to combine letter recognition skills and phonemic awareness to read words [40, 41]. This process includes the transition from reading words by 'decoding' or breaking down sound by sound, to reading 'sight words' or words recognized instantly without needing to be decoded. This ability is an important indicator of successful reading development, leading to further reading comprehension and fluency.

These three indicators guide in measuring the initial reading ability of the alpha generation.

3. Methodology

3.1. Research Design and Sample

This research utilized a nonequivalent control group design in a quasi-experimental design. 200 children of the alpha generation participated in the study overall. Children between the ages of 6-7 years who were born in 2010 or after fulfilling the criteria for alpha generation children. There were 115 girls and 85 boys among them. 100 kids were assigned to the control group in this study, where they were taught to read using conventional media (picture cards). The remaining 100 students were assigned to the experimental group, where they would employ Macromedia Flash interactive learning materials that were centered on their environment and culture.

3.2. Data Collection

An observation sheet in the form of a checklist was used to assess initial reading abilities. The indicators that were examined were the capacity to name letter sound symbols, the capacity to name the same phoneme, and the capacity to name words.

3.3. Analyzing of Data

Several statistical tests, including the descriptive test, normality test, homogeneity test, paired sample t-test, and independent t-test, were carried out using this application. The data were first statistically described using descriptive tests, which involved calculating the mean, median, and standard deviation of the observed variables. This assisted in giving a summary of the traits of the research sample. Next, the observed data were examined to see if they adhered to a normal distribution using the normality test. To make sure that the statistical assumptions supporting the data analysis were met, it was crucial to do this normality test.

A homogeneity test was then carried out to determine whether the variance in the experimental and control groups was similar. Before doing the t-test, this homogeneity test was necessary to make sure that the variances between the two groups were comparable. The average difference in the experimental group before and after the intervention was then compared using a paired sample t-test. This test was conducted to determine how interactive learning media affected the initial reading abilities of the alpha generation. The mean difference between the control group and the experimental group was then compared using an independent t-test. This test was performed to see if the two groups' initial reading skills differed significantly from one another. It was anticipated that with this set of statistical tests, performed with the aid of the

SPSS 26 application, accurate analytical results could be obtained and could be properly interpreted to support the research findings.

3.4. The question of this Research

The question of this research is whether there is a difference in the average initial reading ability of alpha generation students between the group that uses cultural and environment-based interactive media Macromedia and the group that uses picture card media? With the following statistical hypothesis:

Ho: There is no difference in alpha generation students' average initial reading ability between the group that uses cultural and environment-based interactive media Macromedia and the group that uses picture card media.

Ha: There is a difference in the average initial reading ability of alpha generation students between the group that uses cultural and environment-based interactive media Macromedia and the group that uses picture card media.

This hypothesis will be answered in this research process

4. Findings/Results

This research began at the planning stage. The researcher put together a lesson plan during the planning stage. While the control class learned using picture cards (traditional), the experimental class used learning through culture- and environment-based Macromedia interactive media. In the control class, learning was done as usual during the implementation stage. After presenting the topic, the teacher showed students how to use picture cards. The picture cards were the subject of inquiries from the teacher and pupils. The exchange of queries and replies continued until all the kids had absorbed the information.

The teacher gave the students in the experimental class an overview of the course material. This introduction was accomplished by giving the pupils a foundational understanding of the subject to be learned and connecting it to their cultural and environmental background. This made the connection between the learning material and their daily lives clearer to the students. The pupils were then shown how to use Macromedia interactive media after the material had been introduced. The interactive capabilities offered by digital media, as well as how students can engage with the learning contents, might all be explained by teachers. Students were able to comprehend how to use interactive media efficiently due to this demonstration. Students would take part in interactive exercises using the Macromedia media after the demonstration. Reading interactive texts, choosing words, responding to inquiries, working out reading riddles, and other activities that are pertinent to initial reading learning may be included in these activities. Through engagement with the media, students would have the chance to actively participate in the learning process. Encouragement of conversation and teamwork among pupils was crucial while using interactive technology. Teachers might let students share their thoughts, ideas, and experiences about the course materials through small group discussions, question-and-answer sessions, or paired activities. Student connection and mutual learning were improved by this collaboration. Throughout the learning process, teachers gave pupils detailed feedback on their initial reading abilities. Feedback could be given with an emphasis on areas that require improvement or reinforcement of accomplishments. Students could increase comprehension, fix mistakes, and further build their initial reading skills through constructive feedback.

The next step was to assess the data after each class had received the action or intervention. The first step in data analysis was tabulating the data, which involves arranging the data into tables or other formats that make it easier to interpret and comprehend the data. The outcomes of the data tabulation could then be applied to additional analysis or give a summary of the gathered data. The data tabulation's findings are listed below:

Table 1.
Data Tabulation

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test of Experimental Class	100	44	78	55.54	11.137
Post-Test of Experimental Class	100	78	100	90.65	8.328
Pre-Test of Control Class	100	44	78	57.29	12.531
Post-Test of Control Class	100	44	89	63.41	10.601
Valid N (listwise)	100				

Basic information from the four classes that were measured for the study was included in Table 1. The following phase of data analysis would make use of this information. The normality test came after that. The purpose of the normality test was to determine whether the research data had a normal distribution. Before doing parametric statistical analysis, such as the paired sample t-test and independent sample t-test, normally distributed data was an essential requirement. The Kolmogorov-Smirnov test and the Shapiro-Wilk test are two normality tests that are frequently employed in parametric statistics.

The normality test allows us to determine whether the research data is regularly distributed. The results of a parametric statistical study may be used if the data were normally distributed. Non-parametric statistical analysis was an alternative, nevertheless, if the data were not normally distributed. Before performing more analysis, researchers could perform a normality test to make sure that the statistical assumptions were met, allowing for proper interpretation of the analysis's findings. The results of the normality test are as follows:

Table 2.
Normality test.

Tests of Normality

	Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Initial reading ability	Pre-Test of Experimental class	0.274	100	0.000	0.805	100	0.000
	Post-Test of Experimental class	0.239	100	0.000	0.799	100	0.000
	Pre-Test of Control Class	0.216	100	0.000	0.830	100	0.000
	Post-Test of Control Class	0.248	100	0.000	0.885	100	0.000

Note: a. Lilliefors Significance Correction.

The significant value (Sig.) for all data in the Shapiro-Wilk and Kolmogorov-Smirnov tests was more than 0.05 based on the results of Table 2. A normal distribution of the research data might be inferred if the significance value was greater than 0.05. Since the research data was thought to be normally distributed, the researcher could evaluate the data using parametric statistical methods such as the paired sample t-test and independent sample t-test.

The paired sample t-test was the subsequent test. A statistical test called the paired sample t-test was employed to see if there was a significant difference between the means of the two paired samples. The question "Is there an effect of interactive beginning reading media using environmental and cultural-based macromedia flash on the initial reading ability of the alpha generation?" was addressed in the context of this study using the paired sample t-test. A paired sample t-test was run on the pre-test and post-test data in the experimental group using Macromedia media to address the problem formulation. The pre-test and post-test results of the control group employing picture cards were likewise subjected to a paired sample t-test.

The purpose of this paired sample t-test was to compare the variation in the mean scores for each group before and after the intervention. This allowed researchers to compare the initial reading abilities of the experimental group using Macromedia media and the control group using image cards to see if there was a significant difference. The findings of this paired sample t-test would reveal whether Macromedia media has a substantial impact on elementary school kids' initial reading abilities. The hypothesis that Macromedia media has a beneficial impact on the initial reading skills of alpha-generation kids would be supported if there was a significant difference between the pre-test and post-test in the experimental group. Here are the calculation's outcomes:

Table 3.
Paired Samples Test.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test of Experimental Class - Post-Test of Experimental Class	-35.110	14.954	1.495	-38.077	-32.143	-23.478	99	0.000
Pair 2	Pre-Test of Control Class - Post-Test of Control Class	-6.120	6.985	.699	-7.506	-4.734	-8.761	99	0.094

Based on the findings of the paired sample t-test output in Table 3, the significance value (Sig.) in Pair 1 (pre-and post-tests of the experimental class using Macromedia) was 0.000, which was less than the 0.05 significance level. The experimental class that used Macromedia media based on environment and culture demonstrated a significant average difference in students' initial reading abilities between the pre-test and post-test.

Additionally, the significance value (Sig.) in Pair 2 (pre-test and post-test of the control class using the traditional model) was 0.094, which was less than the 0.05 significance level. This showed that, in the control class using traditional media, there was no discernible average difference in the student's initial reading skills between the pre-test and post-test.

Based on these findings, it can be said that Alpha Generation pupils' initial reading ability was significantly impacted by the usage of Macromedia interactive media based on environment and culture. This demonstrated that using Macromedia interactive media centered on culture and environment to teach young children how to read produced greater outcomes than using traditional media.

To determine if the variation or diversity of data between two or more groups is homogenous (the same) or heterogeneous (not the same), the homogeneity test was utilized. The homogeneity test was performed in this study to examine whether the variance of the post-test results for the experimental class and the control class was homogeneous. These are the homogeneity test findings:

Table 4.
Homogeneity Test.

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Initial reading ability	Based on Mean	7.775	1	198	0.006
	Based on Median	7.503	1	198	0.007
	Based on Median and with adjusted df	7.503	1	189.112	0.007
	Based on trimmed mean	7.522	1	198	0.007

Based on Table 4, the homogeneity test based on the mean's significance value (sig.) was 0.06, exceeding the 0.05 level of significance. Thus, it may be said that the variance of the post-test results for the experimental class and the control class was homogenous or equal. One of the non-absolute requirements of the independent sample t-test test was satisfied with the completion of the homogeneity requirement. The assumption of homogeneity of variance was crucial to guarantee reliable findings when using the independent sample t-test to compare the means between two independent groups. The researcher might then carry out an independent sample t-test to examine the standard deviation of the difference in alpha generation starter reading skills between the experimental group (which utilized Macromedia media) and the control group (which used image cards).

The independent sample t-test came next. The mean difference between the two unpaired samples was compared using the independent sample t-test. The question "Is there a difference in the initial reading ability between children who learn by using Macromedia based on culture and environment and students who use picture cards" was addressed in this study using the independent sample t-test. An independent sample t-test was run on the post-test results from the experimental class using Macromedia and the post-test results from the control class using image cards to respond to the problem formulation. This exam was designed to see if there was a substantial difference between the two groups' average initial reading abilities.

The findings of the independent sample t-test will show whether using Macromedia or picture cards had a significant effect on elementary school pupils' initial reading abilities. The idea that students who utilized Macromedia and students who used picture cards had different initial reading abilities would be supported if there was a large average difference between the two groups.

Table 5.
Results of Independent Samples T-Test.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Initial reading ability	Equal variances assumed	7.775	0.006	20.206	198	0.000	27.240	1.348	24.581	29.899
	Equal variances not assumed			20.206	187.493	0.000	27.240	1.348	24.581	29.899

Based on the results of Table 5, the significance value (sig.) in the independent sample t-test was 0.0000, which was lower than the 0.05 significance level. As a result, it can be said that Ha accepeted and there was a substantial difference between the groups using image cards and Macromedia interactive media in terms of the average students' initial reading skills.

This showed that, when compared to picture card media, the use of Macromedia interactive media centered on culture and environment had a significant impact on students' reading skills. This result confirmed the formulation of the issue, which suggested that groups utilizing image cards and groups using Macromedia interactive media had different initial reading abilities based on culture and environment. The experimental class post-test score was greater than the control class post-test score, a finding that was further supported by Table 1. This indicated that children who learned using Macromedia interactive media based on culture and environment were better able to read than those who learned using picture card media (traditional).

The increase in elementary school students' initial reading ability in terms of the number of students who reach the minimum standard for initial reading can be seen in the following graph:

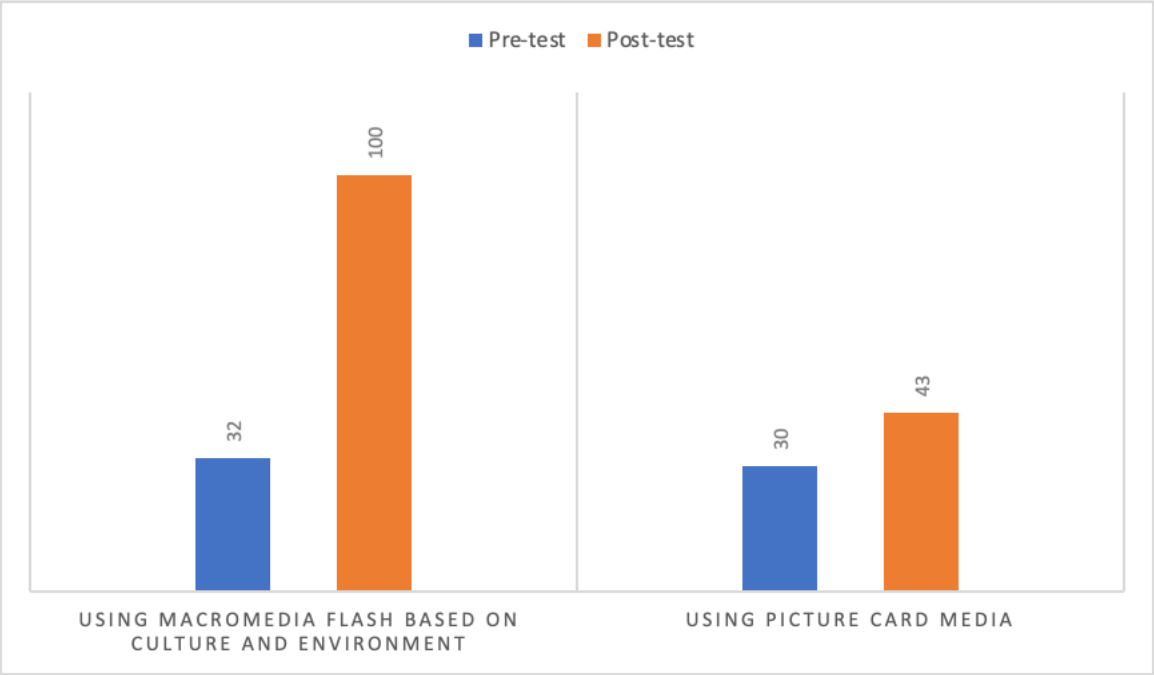

Figure 2.
Increase The Number of Alpha Generation Elementary School Students in Each Class.

From Figure 2, students who studied using Macromedia Flash experienced an increase from 32 people who reached the minimum standard of initial reading ability to 100 people with a percentage increase of 68%, while students who studied using picture cards experienced an increase from 30 people who reached the standard. The minimum initial reading ability is 43 people, with a percentage increase of 13%. This result proves that using culture- and environment-based macromedia flash media can improve the beginning reading abilities of alpha-generation students.

Moreover, the effectiveness can be seen from the average initial reading ability of elementary school students in both class groups as follows:

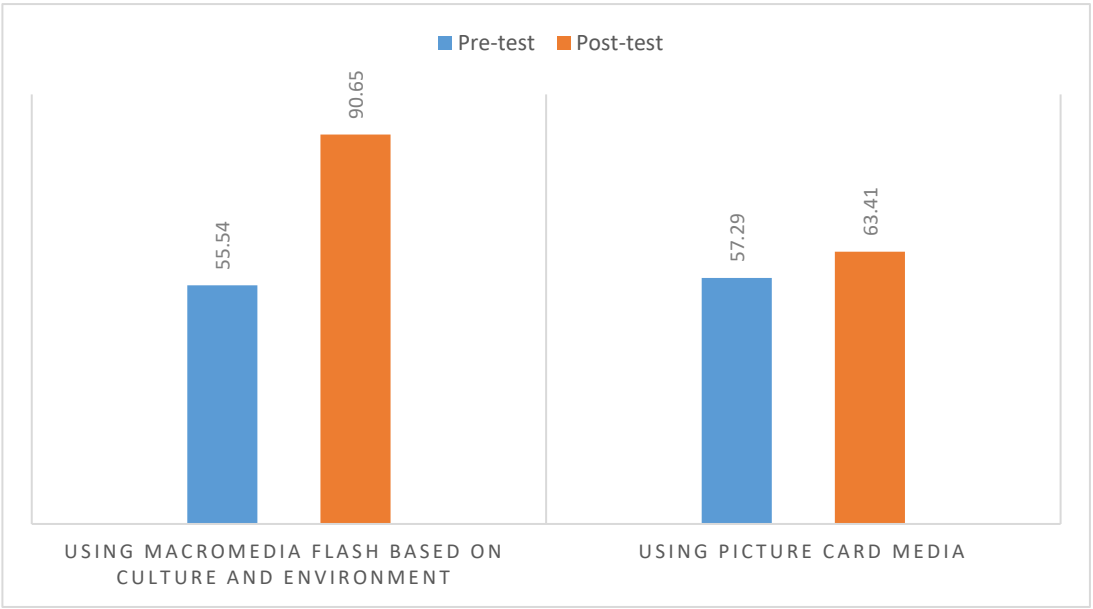

Figure 3.
Average Initial Reading Ability in Both Class Groups.

From Figure 3, it is observed that students who learned using Macromedia Flash based on culture and environment experienced a significant increase in average initial reading ability from a pre-test score of 55.54 to 90.65, an increase of 63.22%. Meanwhile, students who learned using picture cards had a pre-test score of 57.29 and experienced a slight increase to 63.41, an increase of 10.68%. This proves that students learning with Macromedia Flash media based on culture and environment effectively increase the average initial reading ability significantly.

This effectiveness can also be seen from the achievement of initial reading indicators from students learning using Macromedia Flash media based on culture and environment in the following graph:

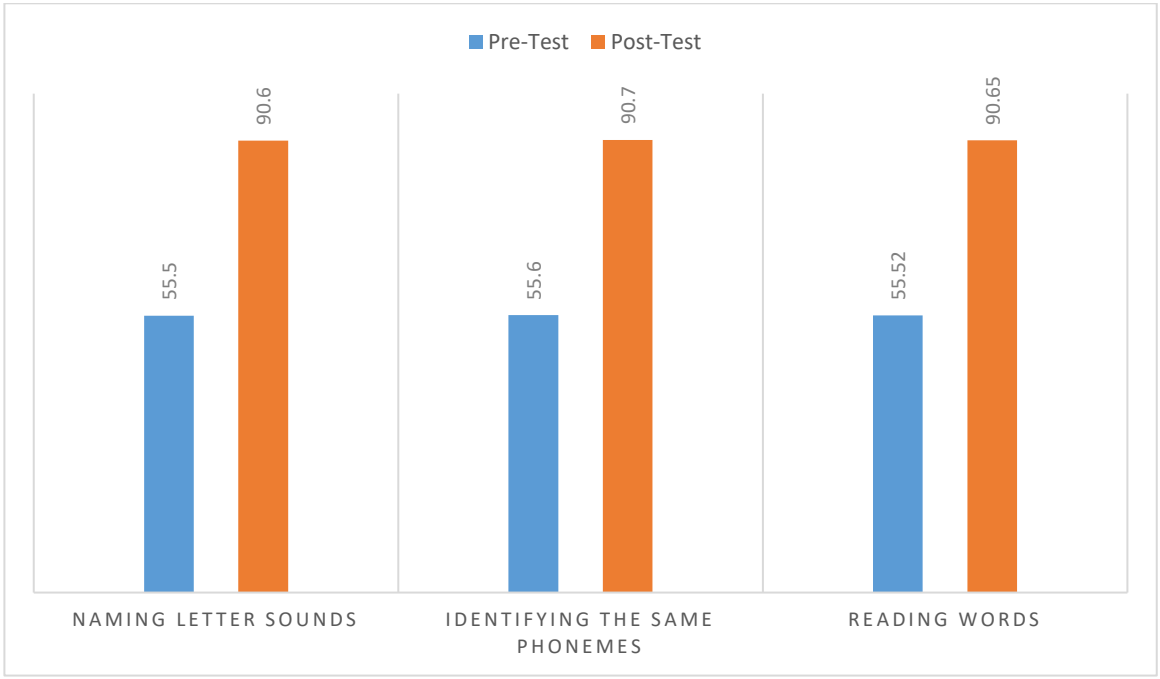

Figure 4.
Average Achievement of Students Learning Using Macromedia Flash Media Based on Culture and Environment.

From Figure 4, on the indicator of naming letter sounds, students learning using Macromedia Flash based on culture and environment experienced a significant average increase from a pre-test score of 55.50 to 90.60, an increase of 63.24%. On the indicator of identifying the same phonemes, there was a significant average increase from a pre-test score of 55.60 to 90.70, an increase of 63.13%. Similarly, with the indicator of reading word ability, there was a significant average increase from a pre-test score of 55.52 to 90.65, an increase of 63.27%. These results indicate that there is an increase in the initial reading ability of students learning using Macromedia Flash media based on culture and environment, as seen from each indicator.

These results are also reinforced by the findings from the observation sheet in the form of a checklist that was compiled to evaluate the effectiveness of Macromedia Flash media based on culture and environment in enhancing students' initial reading skills. There is significant evidence that each indicator has improved. Firstly, in the indicator for naming letter sounds, observations indicate that students in the experimental class, who used the Macromedia Flash learning media, were able to name letter sounds more clinitial and accurately compared to before the intervention. This indicates an increase in a fundamental ability crucial for the learning of initial reading. Next, for the indicator of identifying the same phonemes, observational data shows a striking improvement in students' abilities to identify and name the same phonemes. This increase indicates that students have not only gained a better understanding of letter sound symbols but also are able to apply this understanding in a broader context, which is a critical step in the development of reading skills. Thirdly, in terms of reading words, observations revealed that the use of Macromedia Flash media rich in cultural and environmental elements significantly contributed to students' abilities in word reading. Students demonstrated significant progress in recognizing and reading words, indicating that this learning media is effective in reinforcing reading skills at the initial stages.

Overall, these results affirm that the use of Macromedia Flash learning media based on culture and environment has a positive impact on all three indicators of initial reading ability, underlining its effectiveness in supporting the reading learning process for Generation Alpha students

5. Discussion

The study results show a significant difference in the average initial reading ability of alpha generation students between the group that uses cultural and environment-based interactive media Macromedia and the group that uses picture card media. This result proves that using cultural and environmentally based interactive media, such as Macromedia, effectively increases the initial reading of alpha-generation elementary school students. Hehakaya et al. did a study on the creation of an active learning model for junior high school students with the use of Macromedia Flash [42]. According to the study's findings, an active learning model supported by Macromedia Flash had been created and was valid and successful in enhancing junior high school students' exposition reading abilities. Siregar et al.'s study looked at Macromedia interactive media for children in primary schools [25]. According to the study's findings, interactive media with Macromedia assistance had been created to help young children better understand poetry. The development of Macromedia-assisted media for elementary school children was studied by Indrakumara [26]. According to the study's

findings, supporting teaching materials with the macromedia flash feature have been created that may help primary school pupils become more motivated to learn. Purnama et al. study looked at how Macromedia media affects junior high school students [43]. According to the study's findings, reading comprehension improved for students who used Macromedia to learn. Darmawan & Sari did another study to look at how using Macromedia media affected the learning of high school students [44]. According to the study's findings, using Macromedia media helped high school pupils' reading abilities. These studies show that study into the usage of Macromedia has started, but the studies only looked at the impact of using Macromedia on reading comprehension abilities. Being a novel discovery in this study because the use of interactive Macromedia media can also influence the initial reading skills of alpha-generation kids.

The group of kids born between 2010 and 2025 was referred to as the "Alpha Generation" [45, 46]. They represented the generation that was raised and formed throughout the development of the more complex digital era. The name "Alpha" was chosen to represent them as the first generation to be born in the twenty-first century by using the first letter of the Greek alphabet. The generation most closely associated with digital technology was frequently considered to be Generation Alpha [10, 47]. They were raised in an era when the internet, social media, mobile technology, and other technologies were all developing. They were familiar with the use of apps, digital media, and online platforms from an initial age since they had easy access to electronic devices like smartphones, tablets, and computers as they were growing up [48, 49]. The Alpha generation differs from earlier generations in that they were raised in the digital era and have certain traits. They frequently have greater technological proficiency, a greater familiarity with digital media, and high expectations for connectivity and simple access to information [50]. In terms of education and child development, it was critical to comprehend the traits of the Alpha generation. Their ability to learn, interact, and communicate has been impacted by the quick development of technology. To support the Alpha generation's optimal growth, educational approaches, and learning strategies would need to be adjusted to their needs and qualities, including when teaching pupils how to read.

One of the alternative technologies used to improve the initial reading abilities of the alpha generation was the employment of culture- and environment-based Macromedia interactive media. Technology may be a powerful instrument for engaging the Alpha generation in the educational process and capturing their interest. By fusing visual components, sound, animation, and practical experience, interactive learning tools like Macromedia Flash can provide content in an engaging and participatory way. Macromedia Flash can be used to create interactive stories, word games, reading simulations, and other activities that allow students to actively participate and engage in the process of learning to read in the context of developing their initial reading skills. Students' ability to connect learning to their everyday context, improve their understanding, and boost learning motivation can all be aided using environment and culture in learning media.

There were several reasons why the initial reading abilities of children from the alpha generation improved. The first element was visual appeal. Children of the Alpha generation's initial reading abilities were enhanced through the usage of Macromedia interactive media based on culture and environment. Children of the Alpha generation showed a strong interest in engaging and interactive visual experiences [51-53]. This Macromedia interactive media delivered learning materials using interesting graphics, animation, and multimedia components in the context of initial reading learning. Students' interest and attention were drawn to these interesting graphics, which increased their desire to participate in the learning process. Rich visualizations significantly improved students' comprehension of crucial reading topics [54-57]. Students were able to comprehend concepts better and draw links between written symbols and their meanings through the usage of images, graphs, diagrams, and animations. Additionally, visual appeal encouraged students' imagination and creativity since it allowed them to think imaginatively, connect images to the text they were reading, and deepen their learning through imagination [57-62]. The experiences of the students were enriched by these varied and interesting learning opportunities, which also improved their assimilation and memory of the material. The aesthetic appeal in the cultural and environment-based Macromedia interactive media, when combined with other interactive aspects, created a learning environment that was engaging, compelling, and supported the development of initial reading skills in children of the Alpha generation.

The next factor was the way that Macromedia's interactive media promotes experience learning based on culture and environment. Students participated actively in this learning process by having direct interactions with the course material. Students had the chance to carry out tasks, provide answers to inquiries, and resolve issues through the interactive activities offered through this interactive media. In the context of initial reading learning, pupils could take an active role in reading by choosing words, skimming the text, responding to text-related questions, or completing reading puzzles. This gave children the opportunity to engage directly and apply the concepts of initial reading in a real-world environment [63-66]. Students could improve their reading abilities, obtain a better awareness of the value of initial reading, and gain a deeper comprehension of these concepts by participating in this form of hands-on learning.

Then, this Macromedia interactive media also had relevance for culture and the environment. Students could more readily connect learning to the context of their daily lives by considering cultural and environmental grounds while creating Macromedia interactive learning media. They were able to connect the learning materials to their own lives, experiences, and environment. Students were more motivated to learn because of being able to better understand the meaning and relevance of what they were learning [67-72]. Interactive media could strengthen students' emotional connections to learning by considering cultural and environmental factors. Students can believe that the course materials are relevant to both their daily lives and cultural identities. Due to their sense of connection to what they are learning, this enhanced students' interest and motivation in their studies. Additionally, this method improved students' comprehension of the subject matter since it allowed them to relate the ideas to real-world situations.

Macromedia interactive media that are based on culture and environment also offer options for repetition and feedback. Repeating the subject and receiving consistent feedback was crucial in the context of initial reading learning. Students'

knowledge of the fundamental reading concepts was strengthened by repetition [61, 73-77]. Students could see, hear, or interact with the learning materials frequently through interaction, which helped them solidify their comprehension. Additionally, rapid and detailed feedback allowed students to remedy errors and improve their understanding [78-81]. Instant feedback could be provided through interactive media, enabling students to observe the outcomes of their actions or responses in real-time. This supported right comprehension and assisted pupils in recognizing and addressing their errors. Students could effectively build their initial reading skills and improve their level of comprehension and reading success by repeating topics and receiving feedback through interactive media. These elements were what led to the ability of the alpha generation to be enhanced using Macromedia interactive media that is based on environment and culture. So that the initial reading abilities of the alpha generation might be improved using this Macromedia interactive media that is based on culture and environment.

6. Conclusion

According to the research, using Macromedia interactive media with a focus on culture and environment was proven to have an impact on enhancing initial reading skills in children of the alpha generation. Children of the Alpha generation who learned through Macromedia interactive media based on culture and the environment had better initial reading skills than children who studied through traditional media. This demonstrates how Macromedia interactive media based on culture and environment can be utilized as a method to enhance the initial reading abilities of the alpha generation.

7. Recommendations

Based on the results of this research, several recommendations can be taken for developing and applying environmental and culture-based learning media using Macromedia Flash. Elementary schools are advised to integrate this media into their curriculum because it can improve the reading skills of Alpha generation children in an exciting and relevant way. Teachers must also be trained in using and integrating this technology with existing teaching methods. Development of this media must continue to ensure the content remains up-to-date and relevant. This includes updating the material based on user feedback and the latest developments in educational technology. Further research is needed to explore the long-term effects of this medium through longitudinal studies. Collaboration with cultural and environmental experts can improve the quality and accuracy of learning materials, ensuring the material delivered is appropriate to the local context. Additionally, trials of this media in various educational contexts other than primary schools, such as community literacy programs, could help measure its effectiveness more broadly. With these recommendations, environmental and culture-based learning media using Macromedia Flash can more effectively improve the early reading abilities of Alpha generation children and significantly contribute to educational innovation.

8. Limitations

This research has several limitations that need to be considered. One of them is the relatively short duration of the research, so the long-term impact of using Macromedia Flash-based learning media cannot be thoroughly evaluated. Longitudinal studies that monitor the development of children's reading abilities over time will provide more in-depth information about the long-term effects of this medium. Considering these limitations, this research's findings can still provide an essential contribution to the development and application of environmental and culture-based learning media using Macromedia Flash.

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