PENGARUH MODEL PEMBELAJARAN *CULTURALLY RESPONSIVE TEACHING* BERBANTUAN MEDIA KINCIR ANGKA TERHADAP HASIL BELAJAR MATEMATIKA PADA SISWA KELAS II DI SANGGAR BELAJAR PANDAN MALAYSIA

JURNAL

Diajukan guna Melengkapi Tugas-Tugas dan Memenuhi Syarat-Syarat
Guna Mencapai Gelar Sarjana Pendidikan (S.Pd.)
Program Studi Pendidikan Guru Sekolah Dasar

Oleh

IFFADA HAYU DIANIS
NPM. 2102090035

FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
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FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Medan 20238 Telp. 061-6622400 Ext, 22, 23, 30
Website: http:/www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

BERITA ACARA

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Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Sumatera Utara

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Nama : Iffada Hayu Dianis
NPM : 2102090035
Prog. Studi : Pendidikan Guru Sekolah Dasar
Judul Artikel : Pengaruh Model *Culturally Responsive Teaching* Berbantuan Media Kincir Angka terhadap Hasil Belajar Matematika pada Siswa Kelas II Di Sanggar Belajar Pandan Malaysia

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Ketua

Dra. Hj. Syamsuyurnita, M.Pd.

Sekretaris

Dr. Hj. Dewi Kesuma Nst, S.S., M.Hum.

ANGGOTA PENGUJI:

1. Suci Perwita Sari, S.Pd., M.Pd. 1. _____
2. Mawar Sari, S.Pd., M.Pd., AIFO Fit. 2. _____
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Nama Lengkap : Iffada Hayu Dianis
N.P.M : 2102090035
Program Studi : Pendidikan Guru Sekolah Dasar
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Medan, Februari 2025

Disetujui oleh:
Pembimbing

Dr. Hj. Dewi Kesuma Nst, M.Hum.

Diketahui oleh:

Dekan

Dra. Hj. Syamsuyurnita, M.Pd.

Ketua Program Studi

Suci Perwita Sari, S.Pd., M.Pd.

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FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
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Website: http://www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

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BERITA ACARA BIMBINGAN ARTIKEL

Nama Lengkap : Iffada Hayu Dianis
NPM : 2102090035
Program Studi : Pendidikan Guru Sekolah Dasar
Judul Artikel : Pengaruh Model Pembelajaran *Culturally Responsive Teaching* Berbantuan Media Kincir Angka terhadap Hasil Belajar Matematika pada Siswa Kelas II di Sanggar Belajar Bimbingan Pandan Malaysia

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Dr. Hj. Dewi Kesuma Nst, SS, M.Hum.

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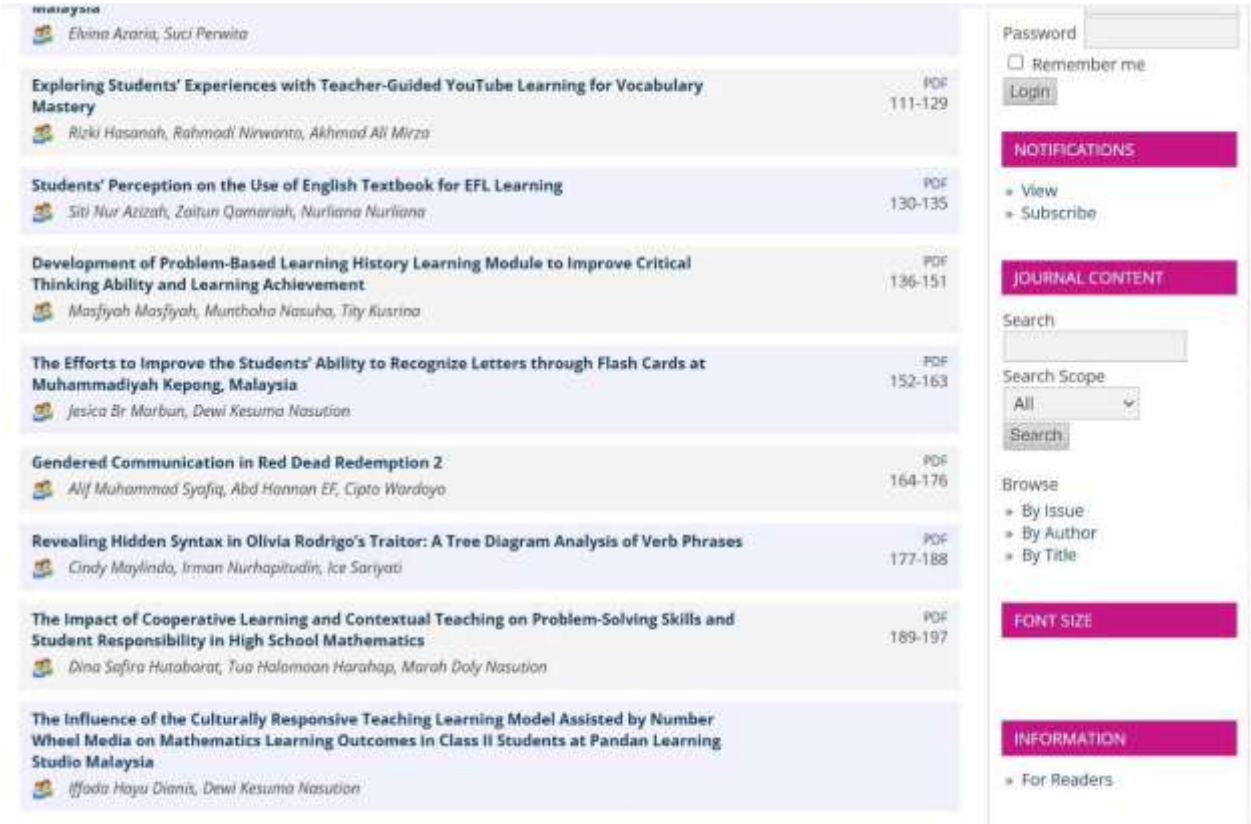

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The Influence of Culturally Responsive Teaching Learning Model with Number Wheel Media on Mathematics Learning Outcomes at Pandan Malaysia Learning Center

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*Iffada Hayu Dianis, Dewi Kesuma Nasution[12]
[12]Muhammadiyah University of North Sumatra, Indonesia.
Corresponding Author: iffadahayudianis2004@gmail.com

ABSTRACT

This study was initiated due to challenges in student learning activities, particularly in mathematics. The teaching method used was predominantly lecture-based and teacher-centered, which led to student boredom and low learning outcomes. Educators mostly employed lectures and question-and-answer sessions without incorporating varied strategies or engaging media. As a result, students showed limited improvement in mathematics performance. The research aimed to examine the impact of the Culturally Responsive Teaching (CRT) model, supported by the use of number wheel media, on the mathematics learning outcomes of grade II students at the Pandan Malaysia Learning Studio. This study used a quantitative research approach with a one-group experimental design. The sample included all 13 grade II students at the studio. The research instrument was a mathematics test consisting of 12 validated items, administered as both a pre-test and a post-test. Findings showed a significant improvement in student outcomes after implementing the CRT model with number wheel media. The average score of the control class was 58.00, while the experimental group that used the innovative method scored an average of 79.23. Based on the "Independent Samples Test," the significance value (sig. 2-tailed) was 0.000, which is less than 0.05, indicating a statistically significant effect. In conclusion, the study found that the Culturally Responsive Teaching model, when combined with number wheel media, positively influenced the mathematics learning outcomes of grade II students at the Pandan Malaysia Learning Studio, highlighting the importance of engaging, student-centered learning strategies.

Keywords : *Culturally Responsive Teaching, Number Wheel Media, Learning Mathematics*

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INTRODUCTION

According to Efendi and Ningsih (2022), education is a process of transferring values and

information with the aim of preparing humans to face life's problems. One way to view education is as an indicator of a nation's development and welfare. To create competent human resources, education is intended to help people learn new things, develop their abilities, and change their attitudes. Education is an inherent part of life. The beginning of a student's learning journey is education. Education instills knowledge that can be used immediately to solve real-world problems. In order for students to be able to implement it in their habits at home, education must provide them with opportunities to learn in the real world. According to Gaol (2022), basic education lays the foundation for instilling intellectual, emotional, and social intelligence, which underlies lifelong learning. Mathematics is a major subject in basic education. Learning mathematics is very important (Savriliana et al., 2020). Because mathematics is a topic of reasoning and knowing it can help students develop their talents, mathematics is a subject that can be used to help students build their personalities. At any level of education, being proficient in mathematics can help you develop a positive attitude when studying other subjects (Pasinggi & Thuken, 2019).

Numbers, computation, numerical problems, quantities, patterns, shapes, and structures are all fundamental to the discipline of mathematics. In addition to serving as the foundation for other systems and tools, mathematics is also a thinking tool. This shows that mathematics covers more than just numbers; it also involves analytical and practical skills (Nurhasanah, 2024). One of the main disciplines that should be studied in elementary school is mathematics. Learning mathematics helps students become more critical, logical, and creative thinkers, which is very helpful when facing challenges in everyday life. In line with the opinion of (Fadhilah et al., 2019) which states that various activities offer students learning experiences to help them acquire the competencies they need. This includes understanding mathematical principles and the ability to use them to solve routine problems. It is important to master the various challenges that exist in everyday life, as well as understand mathematical concepts, so that mathematics learning is successful. Students usually concentrate on personal abilities when solving problems and achieving correct results, with limited opportunities to collaborate and dialogue with their friends.

Based on observations made on the teaching and learning process at Sanggar Belajar Pandan Malaysia, researchers found problems in the mathematics learning process. Assignments and lectures are the methods used during the learning process. To reduce students' interest in learning mathematics, teachers can include questions and answers at the beginning or end of class. Lack of focus on students, lack of learning strategies that encourage student participation, and some students still appear passive and have difficulty understanding the subjects taught by the teacher, so that students have poor learning outcomes.

The method used in this study is to include the culture in the place where students live, to provide a learning environment that feels realistic, which will increase students' willingness to learn mathematics. The formation of character based on noble cultural values is influenced by education and culture, which greatly determines the growth and development of the noble values of our country (Nurliastuti et al., 2018). Therefore, a mathematics teaching method is needed that integrates local culture. This is known as culturally responsive teaching, and is assisted by the Kincir figures media. Culturally Responsive Teaching is a learning approach that connects cultural identity into the learning process (Zulaeha et al., 2024). The Culturally Responsive Teaching model assisted by the number wheel media has the potential to improve mathematics learning outcomes in the learning studio where students will gain an appreciation of cultural diversity and its integration with learning materials. By integrating students' cultural elements and using media that can visualize mathematical concepts concretely, the learning process becomes more effective and enjoyable. The Culturally Responsive Teaching model is an educational approach that recognizes and appreciates cultural diversity in the classroom, with the aim of increasing student engagement and learning relevance. This model links learning materials to students' cultural experiences,

making learning more meaningful and interesting for them (Khasanah, 2023). Culturally Responsive Teaching helps students to establish cultural connections with meaning to instill knowledge, skills, and character. (Miskiyyah & Buchori, 2023). Teachers can be learning facilitators only but also act as guides who can introduce and explore the material that will be taught to students. With this, each student can feel comfortable during the learning process using concrete media, one of which is the Number Wheel Media and students actively participate in the learning process. The Knowledge Number Wheel (CHIPPING) is a learning tool used. A rotating wheel containing numbers and a bag containing questions about the subject matter that will be taught to students is an example of a visual learning tool from Kicaun Media in the form of a game. What is meant by "number wheel" is an educational game tool (APE) in the form of a circle resembling a Ferris wheel and a windmill that can be rotated and played by students (Fadila et al., 2023). The number wheel media that can help students in the learning center improve their numeracy skills. The number wheel media is a learning media using a number wheel to illustrate the calculation process or number patterns in their culture that can help students better understand arithmetic operations in mathematics learning. making it easier for students to recognize numbers and presented as a game.

Previous research by Lusida et al. (2024) has provided empirical evidence regarding the effectiveness of the Culturally Responsive Teaching approach which has a positive impact on improving the learning outcomes of grade IV students in science subjects. Similar findings were also reported by Hernita et al. (2024) who noted an increase in the mathematics learning outcomes of grade XI students after using the Culturally Responsive Teaching approach. With the influence of the Culturally Responsive Teaching approach on learning outcomes, there are positive changes as evidenced by the increased learning outcomes of the Culturally Responsive Teaching learning approach.

Most previous studies have focused more on secondary or higher education, while its impact on elementary school students, especially grade II, is still limited. In addition, the use of interactive learning media that is appropriate to the cultural context of students is still rarely studied in depth. Therefore, this study attempts to fill the gap by exploring the effectiveness of CRT combined with Kincir Angka media in improving mathematics learning outcomes in students with diverse cultural backgrounds.

Culturally responsive teaching is essential in this context because it can help students understand mathematical concepts better through an approach that is relevant to their experiences. By linking learning materials to cultural values that they are familiar with, students will be more motivated and find it easier to understand abstract concepts in mathematics. In addition, this approach creates an inclusive learning environment, where each student feels valued and accommodated according to their cultural background. Thus, the application of the CRT learning model with Kincir Angka media not only improves mathematical understanding but also strengthens student involvement and participation in the learning process.

Based on the problems that have been presented, the researcher is interested in studying the research entitled "The Effect of the Culturally Responsive Teaching Learning Model Assisted by the Number Wheel Media on Mathematics Learning Outcomes in Grade II Students at the Pandan Malaysia Learning Studio".

METHOD

This study adopted a quantitative approach by implementing a one-group pretest-posttest design. In this method, the one-group pretest-posttest design has the advantage of being simple to implement and of being able to demonstrate change within the groups being studied. However, this design has a major limitation, namely the absence of a control group, making it difficult to be certain that the changes that occur are truly due to the treatment and

not to other factors, such as time effects or other external factors. Therefore, although this design is useful in preliminary or exploratory research, the results must be interpreted with caution and, where possible, combined with other methods to increase the validity of the study.

Students undergo a pre-test before being given treatment and a post-test after the learning is complete. This study took place during the implementation of the KKNI in class II of Sanggar Belajar Pandan Malaysia, especially in mathematics subjects with a focus on the topic of addition and subtraction. Data collection began in August 2024, with a research instrument in the form of a written test consisting of 20 multiple-choice questions. The sources of questions in this proposal were taken from several sources, including: from YouTube Diligent Learning, Examples of mathematical addition story problems can be found in the Smart Book for Doing Elementary School Mathematics Homework Class II Wahyu Media (2008) and the Book Learning with Friends Elementary School Mathematics Class II owned by the Gakko Tosho Team (2021). Data analysis is the next step after all data is collected. Every piece of information collected is processed so that a conclusion can be drawn. The researcher used quantitative data analysis. The way to arrange data sequences in a size and pattern to arrive at a conclusion is known as quantitative data analysis.

FINDINGS AND DISCUSSION

The first stage in conducting research is testing the research instrument. Before being used as a research data collection tool, a trial of this instrument was conducted to assess the level of validity and reliability of the instrument. The calculation steps for the validity and accuracy tests were used to evaluate the instruments used in this study. Instruments that have met the requirements of the instrument trial findings are suitable for use in research. 20 question items are the details of the test instruments examined in this study.

Validity Test Results

Based on the results of the validity test of the questionnaire instrument using the correlation formula with the help of IBM SPSS Statistics 20, out of 20 test items that have been tested in class II of Sanggar Belajar Pandan Malaysia, only 12 test items can be used. A statement can be said to be valid if r count > r table using a significant value of 0.05, if r count < r table then the statement can be said to be invalid with a significant value of 0.05. The test instrument was tested on 13 students, thus obtaining an r table of 0.05. The analysis of instrument validation can be seen in table 1.1.

Table 1. Test of Question Instrument Validity

Item	Sig. table value (0.05)	Sig.count Value	Status
Item 1	0.05	0,000	Valid
Item 2	0.05	0.243	Invalid
Item 3	0.05	0.010	Valid
Item 4	0.05	0.037	Valid
Item 5	0.05	0.014	Valid
Item 6	0.05	0.150	Invalid
Item 7	0.05	0.028	Valid
Item 8	0.05	0.374	Invalid

Item 9	0.05	0.010	Valid
Item 10	0.05	0.202	Invalid
Item 1 1	0.05	0.010	Valid
Items 1 2	0.05	0.931	Invalid
Items 1 3	0.05	0.113	Invalid
Items 1 4	0.05	0,000	Valid
Items 1 5	0.05	0.010	Valid
Items 1 6	0.05	0.010	Valid
Items 1 7	0.05	0.186	Invalid
Items 1 8	0.05	0.010	Valid
Items 1 9	0.05	0.101	Invalid
Item 20	0.05	0,000	Valid

Validity Test Results

Reliability testing is the next stage after carrying out validity test measurements. The questionnaire instrument that follows this reliability test measurement has valid results. The purpose of the reliability test is to determine how far the results of a measurement can be trusted. The reliability test of the questionnaire instrument uses the Cronbach's Alpha statistical test with the help of IBM SPSS Statistics 20. Based on calculations using SPSS, the Cronbach's Alpha value is 0.736> 0.6. So it can be concluded that all items are declared reliable or consistent. The analysis of the instrument reliability can be seen in table 1.2.

Table 2. Reliability Test of Question Instruments

Reliability Statistics	
Cronbach's Alpha	N of Items
0.738	21

Hypothesis Test Results

This study uses a t-test to test the hypothesis using a sample of thirteen people. To ensure whether this study has an impact, the results below will be very helpful. The basis for making t-test decisions is as follows:
If the significance value (2-tailed) <0.05, then Ha is accepted and Ho is rejected.
If the significance value (2-tailed) > 0.05 then Ha is rejected and Ho is accepted.

In the t-test used is the Independent Sample t-test with the help of IBM SPSS Statistics 20.

Table 3. Hypothesis Testing

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	58.00	13	13,178	3.655
	Posttest	79.23	13	13,504	3,745

Based on the table output above, the t-test data in the table shows that there is a significant influence on the grades of second-grade students of Sanggar Belajar Pandan Malaysia after using the Culturally Responsive Teaching learning model assisted by the number wheel media with the results (M = 79.23, SD = 13.504) and the grades of students before using the Culturally Responsive Teaching learning model assisted by the number wheel media with (M = 58.00, SD = 13.178), sig value (2-tailed) = 0.000 <0.05. then the results of Ha are accepted and Ho is rejected. Therefore, there is a contrasting change when using the Culturally Responsive Teaching learning model assisted by the number wheel media on the mathematics learning outcomes of second-grade students at Sanggar Belajar Pandan Malaysia which is higher than using conventional learning methods.

Table 4. Hypothesis Testing Output 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	Pretest - Posttest	-21,231	16,654	4.619	-31,295	-11,167	-4,596	12	.001

The researcher conducted a study involving second-grade students at Pandan Learning Studio Malaysia. The researcher aims to determine the effect of the "Culturally Responsive Teaching" learning model supported by the number wheel media on students' mathematics learning outcomes.

To find out the results of the research conducted using the "Culturally Responsive Teaching" learning model supported by the number wheel media, this study examined a number of factors related to student learning outcomes in mathematics. The form of the instrument to assess student learning outcomes in mathematics was evaluated using 12 questions, and the instrument was tested using item analysis before using the model. Various statistical tests, such as expert validity tests and reliability tests, were used to analyze the instrument. The results showed that the average learning achievement of students who utilized the "Culturally Responsive Teaching" learning model assisted by the number wheel media was 79.23. While students in classes using traditional learning models had an average learning outcome of 58.00. The data shows that tests using the Culturally Responsive Teaching learning model assisted by Media produced higher scores compared to classes using traditional learning models. Careful planning is needed before using the Culturally Responsive Teaching learning approach assisted by the number wheel. At least, children are already accustomed to the learning model. such as playing, school-related activities, and so on. In addition, the chosen learning paradigm is also intended to encourage students to pay attention.

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Responsive Teaching learning model with the Number Wheel media, teachers must first master it, first the advantages and disadvantages. Teachers will be able to minimize the shortcomings of the Culturally Responsive Teaching learning model with the help of the number wheel media if they already understand it. In addition, mastery of various theories, techniques, and learning tactics is also needed, not only the Culturally Responsive Teaching learning model assisted by the number wheel media. Based on the results of the t-test in the table, it shows that there is a significant influence on the grades of class II students of Sanggar Belajar Pandan Malaysia after using the Culturally Responsive Teaching learning model assisted by the number wheel media with the results (M = 79.23, SD = 13.504) and the grades of students before using the Culturally Responsive Teaching learning model assisted by the number wheel media with (M = 58.00, SD = 13.178), sig value (2-tailed) = 0.000 <0.05. then Ho is rejected and Ha is accepted. Thus, there is a significant difference when using the Culturally Responsive Teaching learning model assisted by the number wheel media on the mathematics learning outcomes of class II students at Sanggar Belajar Pandan Malaysia, which is better than conventional learning.

In this study, there were several obstacles to the research that had been carried out, one of which was the limited research space. Sanggar Belajar Pandan Malaysia functions as a place of research, and is the only location where the research was conducted. There are several variations in the findings if the research was conducted elsewhere. However, the possibility is not significantly different from the findings of the research conducted. Then, due to time constraints, this research was conducted simultaneously with the writing of this thesis. One thing that may limit the research area is time constraints. Ultimately, this research has limitations related to the objects studied. The main focus of this research is to analyze. The influence of the Culturally Responsive Teaching learning model with the help of number wheel media on the mathematics learning outcomes of class II students at the Pandan Learning Center, Malaysia.

The number wheel media in the Culturally Responsive Teaching (CRT) model improves mathematics learning outcomes because it can increase student engagement and help visualize mathematical concepts. As an interactive tool, the number wheel allows students to actively participate in learning, thereby increasing their motivation and understanding of the material. In addition, this tool helps visualize the relationship between numbers and mathematical operations, which is very important for grade II students who are still at the concrete cognitive development stage. In this way, abstract concepts become easier to understand, speeding up the learning process, and improving students' memory of the material being taught.

In the context of Culturally Responsive Teaching, the number wheel can also be adapted to local cultural elements at Sanggar Belajar Pandan Malaysia, such as the use of colors, symbols, or numbers that have meaning in students' daily lives. This cultural integration makes learning more relevant and meaningful, so that students feel closer to the material being studied. With this approach, mathematics learning not only becomes more interesting, but also more effective in improving student learning outcomes, because they can connect new concepts with their own experiences and environments.

CONCLUSIONS

The Culturally Responsive Teaching (CRT) learning model assisted by the Kincir Angka (Number Wheel) media has a significant positive impact on the mathematics learning outcomes of second-grade students at Sanggar Belajar Pandan, Malaysia. By adapting teaching methods to align with students' cultural backgrounds and personal experiences, the CRT approach enhances both conceptual understanding and learning motivation. The use of Kincir

Angka as an interactive learning tool further supports students in grasping mathematical concepts in a concrete and engaging manner. Empirical evidence from the study shows a notable increase in students' average cognitive learning outcomes, rising from 58.00 before the treatment to 79.23 after the implementation of the CRT model. Moreover, statistical analysis confirms the effectiveness of this approach, with a significance value of 0.000, which is less than the threshold of 0.05, indicating a substantial impact of the CRT model on students' performance. Thus, integrating culture-based pedagogy with interactive media presents an effective strategy for enhancing student achievement in mathematics.

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FAKULTAS ILMU PENDIDIKAN
UNIVERSITAS PAHLAWAN TUANKU TAMBUSAI
JalanTuankuTambusai 23 BangkinangKabupaten Kampar Riau
Email: jele.universitaspahlawan@gmail.com, lusimarlenihz@gmail.com

LETTER OF ACCEPTANCE

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Author : Iffada Hayu Dianis[1], Dewi Kesuma Nasution[2]

Affiliation : [1,2] Universitas Muhammadiyah Sumatera Utara

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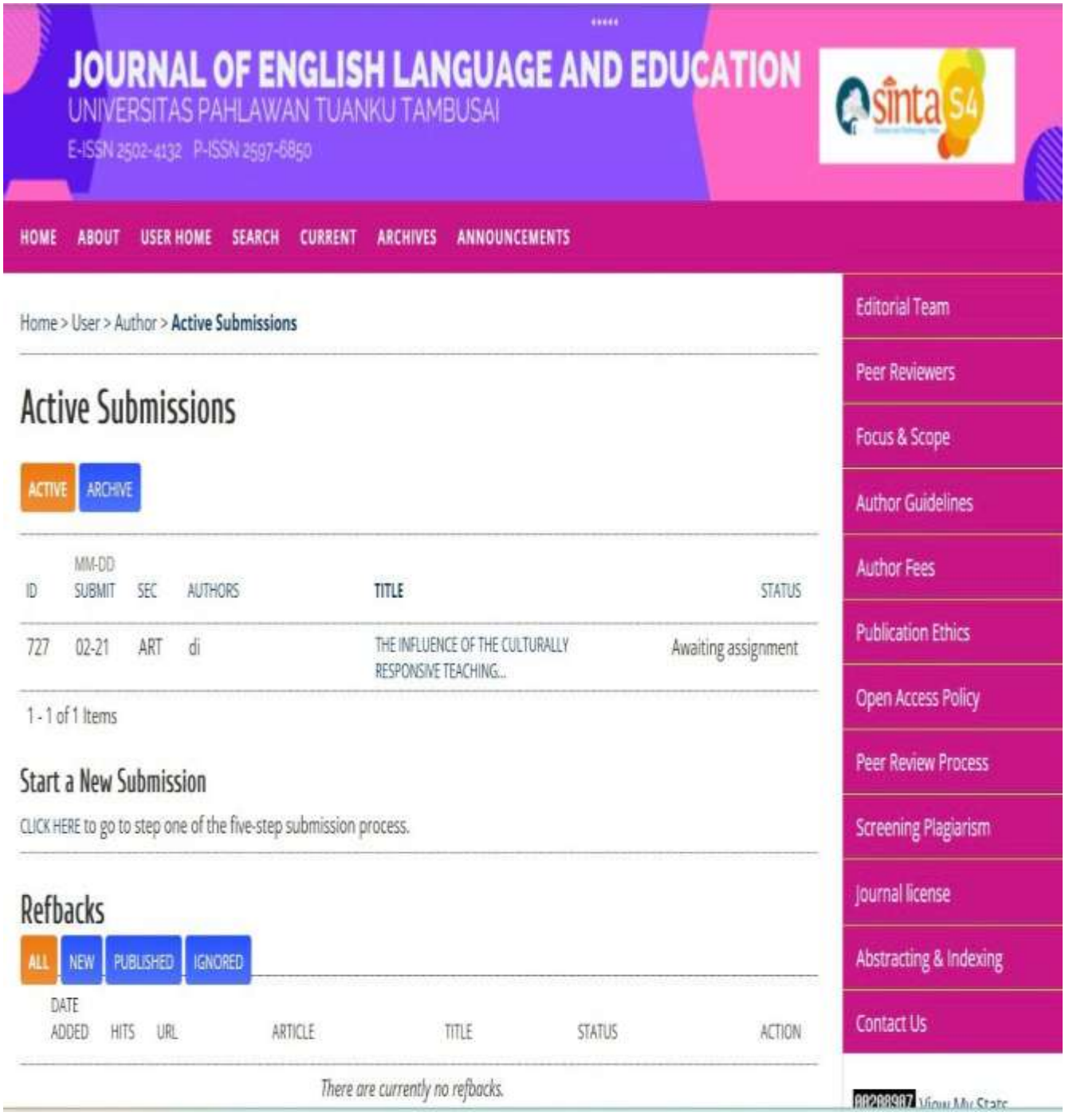

The Influence of the Culturally Responsive Teaching Learning Model Assisted by Number Wheel Media on Mathematics Learning Outcomes in Class II Students at Pandan Learning Studio Malaysia

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* Iffada Hayu Dianis[1] , Dewi Kesuma Nasution[2]
Affiliation (Universitas Muhammadiyah Sumatera Utara)

A B S T R A C T

Problems in student learning activities, especially learning outcomes during mathematics learning activities that are still relatively low and the lack of diversity in learning techniques, prompted this study. In addition, student learning outcomes in mathematics classes are relatively low because teachers only use lecture and question and answer formats. The formulation of the problem that arises is how grade II students at Sanggar Pandan Belajar Malaysia learn mathematics with the Culturally Responsive Teaching learning style assisted by number wheel media. With the help of number wheel media, this study aims to determine whether the Culturally Responsive Teaching learning paradigm has an impact on the mathematics learning outcomes of grade 2 students at Sanggar Belajar Pandan Malaysia. A quantitative research design was used by the researchers. Finding out how culturally sensitive learning strategies assisted by number wheel media affect the arithmetic learning outcomes of grade II students at Sanggar Belajar Pandan Malaysia is the aim of this study. The study was conducted on the research sample, especially the experimental group, which was given pre-test and pro-test treatments. The population and sample in this study amounted to 13 students from Sanggar Pandan Belajar Malaysia. 12 math problem items that had passed the validity test were used as research instruments. By using practical learning materials, the average value of the experimental class was 79.23, while the average value of the control class was 58.00. The output results of the "Independent Samples Test" showed that sig. (2-tailed) was 0.000 <0.05. So it can be concluded that there is an influence of the Culturally Responsive Teaching learning model assisted by the number wheel media on the mathematics learning outcomes of class II students at the Pandan Malaysia Learning Studio.

Keywords: Culturally Responsive Teaching, Number Wheel Media, Learning Mathematics

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INTRODUCTION

According to Efendi and Ningsih (2022), education is a process of transferring values and information with the aim of preparing humans to face life's problems. One way to view education is as an indicator of a nation's development and welfare. To create competent human resources, education is intended to help people learn new things, develop their abilities, and change their attitudes. Education is an inherent part of life. The beginning of a student's learning journey is education. Education instills knowledge that can be used immediately to solve real-world problems. In order for students to be able to implement it in their habits at home, education must provide them with opportunities to learn in the real world. According to Gaol (2022), basic education lays the foundation for instilling intellectual, emotional, and social intelligence, which underlies lifelong learning. Mathematics is a major subject in basic education. Learning mathematics is very important (Savriliana et al., 2020). Because mathematics is a topic of reasoning and knowing it can help students develop their talents, mathematics is a subject that can be used to help students build their personalities. At any level of education, being proficient in

*Corresponding Author: Maspufah, e-mail: iffadahayudianis2004@gmail.com
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mathematics can help you develop a positive attitude when studying other subjects (Pasinggi & Thuken, 2019).

Numbers, computation, numerical problems, quantities, patterns, shapes, and structures are all fundamental to the discipline of mathematics. In addition to serving as the foundation for other systems and tools, mathematics is also a thinking tool. This shows that mathematics covers more than just numbers; it also involves analytical and practical skills (Nurhasanah, 2024). One of the main disciplines that should be studied in elementary school is mathematics. Learning mathematics helps students become more critical, logical, and creative thinkers, which is very helpful when facing challenges in everyday life. In line with the opinion of (Fadhilah et al., 2019) which states that various activities offer students learning experiences to help them acquire the competencies they need. This includes understanding mathematical principles and the ability to use them to solve routine problems. It is important to master the various challenges that exist in everyday life, as well as understand mathematical concepts, so that mathematics learning is successful. Students usually concentrate on personal abilities when solving problems and achieving correct results, with limited opportunities to collaborate and dialogue with their friends.

Based on observations made on the teaching and learning process at Sanggar Belajar Pandan Malaysia, researchers found problems in the mathematics learning process. Assignments and lectures are the methods used during the learning process. To reduce students' interest in learning mathematics, teachers can include questions and answers at the beginning or end of class. Lack of focus on students, lack of learning strategies that encourage student participation, and some students still appear passive and have difficulty understanding the subjects taught by the teacher, so that students have poor learning outcomes.

The method used in this study is to include the culture in the place where students live, to provide a learning environment that feels realistic, which will increase students' willingness to learn mathematics. The formation of character based on noble cultural values is influenced by education and culture, which greatly determines the growth and development of the noble values of our country (Nurliastuti et al., 2018). Therefore, a mathematics teaching method is needed that integrates local culture. This is known as culturally responsive teaching, and is assisted by the Kincir angka media. Culturally Responsive Teaching is a learning approach that connects cultural identity into the learning process (Zulaeha et al., 2024). The Culturally Responsive Teaching model assisted by the number wheel media has the potential to improve mathematics learning outcomes in the learning studio where students will gain an appreciation of cultural diversity and its integration with learning materials. By integrating students' cultural elements and using media that can visualize mathematical concepts concretely, the learning process becomes more effective and enjoyable. The Culturally Responsive Teaching model is an educational approach that recognizes and appreciates cultural diversity in the classroom, with the aim of increasing student engagement and learning relevance. This model links learning materials to students' cultural experiences, making learning more meaningful and interesting for them (Khasanah, 2023). Cultural ly Responsive Teaching helps students to establish cultural connections with meaning to instill knowledge, skills, and character. (Zakiyatul Miskiyyah & Achmad Buchori, 2023). Teachers can be learning facilitators only but also act as guides who can introduce and explore the material that will be taught to students. With this, each student can feel comfortable during the learning process using concrete media, one of which is the Number Wheel Media and students actively participate in the learning process. The Knowledge Number Wheel (KICAUAN) is a learning tool used. A rotating wheel containing numbers and a bag containing questions about the subject matter that will be taught to students is an example of a visual learning tool from Kicaun Media in the form of a game. What is meant by "number wheel" is an educational game tool (APE) in the form of a circle resembling a Ferris wheel and a windmill that can be rotated and played by students (Fadila et al., 2023). The number wheel media that can help students in the learning center improve their

numeracy skills. The number wheel media is a learning media using a number wheel to illustrate the calculation process or number patterns in their culture that can help students better understand arithmetic operations in mathematics learning. making it easier for students to recognize numbers and presented as a game.

Previous research by Lusida et al. (2024) has provided empirical evidence regarding the effectiveness of the Culturally Responsive Teaching approach which has a positive impact on improving the learning outcomes of grade IV students in science subjects. Similar findings were also reported by Hernita et al. (2024) who noted an increase in the mathematics learning outcomes of grade XI students after using the Culturally Responsive Teaching approach. With the influence of the Culturally Responsive Teaching approach on learning outcomes, there are positive changes as evidenced by the increased learning outcomes of the Culturally Responsive Teaching learning approach.

Based on the problems that have been presented, the researcher is interested in studying the research entitled "The Effect of the Culturally Responsive Teaching Learning Model Assisted by the Number Wheel Media on Mathematics Learning Outcomes in Grade II Students at the Pandan Malaysia Learning Studio".

METHOD

This study adopted a quantitative approach by implementing a one-group pretest-posttest design. In this method, students undergo a pre-test before being given treatment and a post-test after the learning is complete. This study took place during the implementation of the KKNI in class II of Sanggar Belajar Pandan Malaysia, especially in mathematics subjects with a focus on the topic of addition and subtraction. Data collection began in August 2024, with a research instrument in the form of a written test consisting of 20 multiple-choice questions. The sources of questions in this proposal were taken from several sources, including: from YouTube Rajin Belajar, Examples of mathematical addition story problems can be found in the Smart Book for Doing Elementary School Mathematics Homework Class II Wahyu Media (2008) and the Book Learning with Friends Elementary School Mathematics Class II owned by the Gakko Tosho Team (2021). Data analysis is the next step after all data is collected. Every piece of information collected is processed so that a conclusion can be drawn. The researcher used quantitative data analysis. The way to arrange data sequences in a size and pattern to arrive at a conclusion is known as quantitative data analysis.

FINDINGS AND DISCUSSION

The first stage in conducting research is testing the research instrument. Before being used as a research data collection tool, a trial of this instrument was conducted to assess the level of validity and reliability of the instrument. The calculation steps for the validity and accuracy tests were used to evaluate the instruments used in this study. Instruments that have met the requirements of the instrument trial findings are suitable for use in research. 20 question items are the details of the test instruments examined in this study.

1. Validity Test Results

Based on the results of the validity test of the questionnaire instrument using the correlation formula with the help of IBM SPSS Statistics 20, out of 20 test items that have been tested in class II of Sanggar Belajar Pandan Malaysia, only 12 test items can be used. A statement can be said to be valid if r count> r table using a significant value of 0.05, if r count <

r table then the statement can be said to be invalid with a significant value of 0.05. The test instrument was tested on 13 students, thus obtaining an r table of 0.05. The analysis of instrument validation can be seen in table 1.1.

Tabel 1.1 Uji Validitas Instrumen Soal

No	Item	Nilai Sig. tabel (0,05)	Nilai Sig.hitung	Status
1	Item 1	0,05	0,000	**Valid**
2	Item 2	0,05	0,243	**Tidak Valid**
3	Item 3	0,05	0,010	**Valid**
4	Item 4	0,05	0,037	**Valid**
5	Item 5	0,05	0,014	**Valid**
6	Item 6	0,05	0,150	**Tidak Valid**
7	Item 7	0,05	0,028	**Valid**
8	Item 8	0,05	0,374	**Tidak Valid**
9	Item 9	0,05	0,010	**Valid**
10	Item 10	0,05	0,202	**Tidak Valid**
11	Item 11	0,05	0,010	**Valid**
12	Item 12	0,05	0,931	**Tidak Valid**
13	Item 13	0,05	0,113	**Tidak Valid**
14	Item 14	0,05	0,000	**Valid**
15	Item 15	0,05	0,010	**Valid**
16	Item 16	0,05	0,010	**Valid**
17	Item 17	0,05	0,186	**Tidak Valid**
18	Item 18	0,05	0,010	**Valid**
19	Item 19	0,05	0,101	**Tidak Valid**
20	Item 20	0,05	0,000	**Valid**

1. Validity Test Results

Reliability testing is the next stage after carrying out validity test measurements. The questionnaire instrument that follows this reliability test measurement has valid results. The purpose of the reliability test is to determine how far the results of a measurement can be trusted. The reliability test of the questionnaire instrument uses the Cronbach Alpha statistical test with the help of IBM SPSS Statistics 20. Based on calculations using SPSS, the Cronbach's Alpha value is 0.736> 0.6. So it can be concluded that all items are declared reliable or consistent. The analysis of the instrument reliability can be seen in table 1.2.

Tabel 1.2 Uji Reliabilitas Instrumen Soal

Reliability Statistics	
Cronbach's Alpha	N of Items
0.738	21

2. Hypothesis Test Results

This study uses a t-test to test the hypothesis using a sample of thirteen people. To ensure whether this study has an impact, the results below will be very helpful. The basis for making t-test decisions is as follows:

a. If the significance value (2-tailed) <0.05, then Ha is accepted and Ho is rejected.

b. If the significance value (2-tailed)> 0.05 then Ha is rejected and Ho is accepted.

In the t-test used is the Independent Sample t-test with the help of IBM SPSS Statistics 20.

Tabel 1.3 Uji Hipotesis

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	58.00	13	13.178	3.655
	Posttest	79.23	13	13.504	3.745

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	Pretest - Posttest	-21.231	16.654	4.619	-31.295	-11.167	-4.596	12	.001

Based on the table output above, the t-test data in the table shows that there is a significant influence on the grades of second-grade students of Sanggar Belajar Pandan Malaysia after using the Culturally Responsive Teaching learning model assisted by the number wheel media with the results (M = 79.23, SD = 13.504) and the grades of students before using the Culturally Responsive Teaching learning model assisted by the number wheel media with (M = 58.00, SD = 13.178), sig value (2-tailed) = 0.000 <0.05. then the results of Ha are accepted and Ho is rejected. Therefore, there is a contrasting change when using the

Culturally Responsive Teaching learning model assisted by the number wheel media on the mathematics learning outcomes of second-grade students at Sanggar Belajar Pandan Malaysia which is higher than using conventional learning methods.

The researcher conducted a study involving second-grade students at Pandan Learning Studio Malaysia. The researcher aims to determine the effect of the "Culturally Responsive Teaching" learning model supported by the number wheel media on students' mathematics learning outcomes.

To find out the results of the research conducted using the "Culturally Responsive Teaching" learning model supported by the number wheel media, this study examined a number of factors related to student learning outcomes in mathematics. The form of the instrument to assess student learning outcomes in mathematics was evaluated using 12 questions, and the instrument had been tested using item analysis before using the model. Various statistical tests, such as expert validity tests and reliability tests, were used to analyze the instrument. The results showed that the average learning achievement of students who utilized the "Culturally Responsive Teaching" learning model assisted by the number wheel media was 79.23. While students in classes using traditional learning models had an average learning outcome of 58.00. The data shows that tests using the Culturally Responsive Teaching learning model assisted by Media produced higher scores compared to classes using traditional learning models. Careful planning is needed before using the Culturally Responsive Teaching learning approach assisted by the number wheel. At least, children are already accustomed to the learning model. such as playing, school-related activities, and so on. In addition, the chosen learning paradigm is also intended to encourage students to pay attention.

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In this study, there were several obstacles to the research that had been carried out, one of which was the limited research space. Sanggar Belajar Pandan Malaysia functions as a place of research, and is the only location where the research was conducted. There are several

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CONCLUSIONS

Conclusions obtained from data analysis and discussion of the study on the impact of the Culturally Responsive Teaching model, supported by the use of number wheel media, on the achievement of second-grade students' mathematics learning at Sanggar Belajar Pandan, Malaysia.

1. The cognitive learning outcomes in English learning on the test before the treatment or treatment of the Culturally Responsive Teaching learning model assisted by the number wheel media obtained an average of 58.00 and on the test after the treatment of the Culturally Responsive Teaching learning model assisted by the number wheel media obtained an average of 79.23. So, the average value of students' mathematics learning outcomes has increased.
2. The Culturally Responsive Teaching learning model assisted by the number wheel media has an effect on the mathematics learning outcomes of second-grade students at Sanggar Belajar Pandan Malaysia. This can be proven that the significance value is 0.000 <0.05.

The suggestions according to the results of the discussion and conclusions obtained in this study are the following suggestions in this study.

1. For teachers, during the teaching and learning process, a teacher must concentrate on the learning strategy that will be used. The demands and learning models of Culturally Responsive Teaching must be considered by this approach, especially those related to the number wheel media and the learning objectives of arithmetic for second-grade students at Sanggar Belajar Pandan Malaysia. The use of the Culturally Responsive Teaching learning paradigm with the help of number wheel media is highly recommended for educators. Thus, the use of number wheel media combined with the Culturally Responsive Teaching learning model can help students get used to using the model as a tool in the learning process.
2. For students, it is hoped that students will make maximum use of the Culturally Responsive Teaching model assisted by number wheel media as a learning resource to improve their knowledge and understanding. This allows students to take a more active role and gain deeper learning insights.
3. For researchers, Researchers focus more on the study of the Culturally Responsive Teaching learning model assisted by the Kincir Angka media on the cognitive assessment aspect in order to measure the level of achievement based on the results of previous studies related to learning methods. This research is useful in influencing the mathematics learning outcomes of second-grade students at Sanggar Belajar Pandan, Malaysia.

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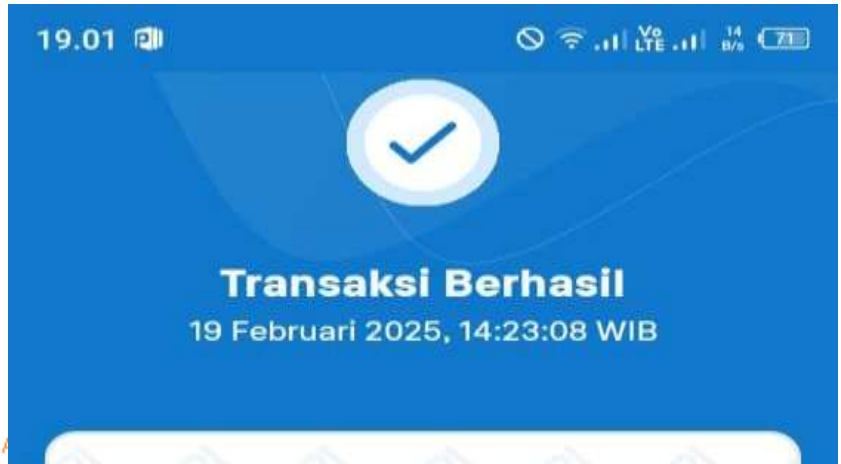

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The Influence of Culturally Responsive Teaching Learning Model with Number Wheel Media on Mathematics Learning Outcomes at Pandan Malaysia Learning Center

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*Iffada Hayu Dianis, Dewi Kesuma Nasution [1,2]
[1,2]Muhammadiyah University of North Sumatra, Indonesia.
Corresponding Author: iffadahayudianis2004@gmail.com

ABSTRACT

This study was initiated due to challenges in student learning activities, particularly in mathematics. The teaching method used was predominantly lecture-based and teacher-centered, which led to student boredom and low learning outcomes. Educators mostly employed lectures and question-and-answer sessions without incorporating varied strategies or engaging media. As a result, students showed limited improvement in mathematics performance. The research aimed to examine the impact of the Culturally Responsive Teaching (CRT) model, supported by the use of number wheel media, on the mathematics learning outcomes of grade II students at the Pandan Malaysia Learning Studio. This study employed a one-group experimental design and a quantitative research methodology. All 13 of the studio's second-graders were included in the sample. A mathematics test with 12 validated items that was given as a pre-test and a post-test served as the research tool. Results indicated that using the CRT approach with number wheel media significantly improved student outcomes. The experimental group that employed the novel approach achieved an average score of 79.23, compared to the control class's average of 58.00. The significance value (sig. 2-tailed) was 0.000, which is less than 0.05 and indicates a statistically significant effect, according to the "Independent Samples Test." The study concluded that the use of number wheel media in conjunction with the Culturally Responsive Teaching model improved the learning outcomes of grade II students in mathematics at the Pandan Malaysia Learning Studio, underscoring the significance of effective, student-centered teaching methods.

Keywords : *Culturally Responsive Teaching, Number Wheel Media, Learning Mathematics*
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INTRODUCTION

According to Efendi and Ningsih (2022), education is a process of transferring values and information with the aim of preparing humans to face life's problems. One way to view education is as an indicator of a nation's development and welfare. To create competent human resources, education is intended to help people learn new things, develop their abilities, and change their attitudes. Education is an inherent part of life. The beginning of a student's learning journey is education. Education instills knowledge that can be used immediately to solve real-world problems. In order for students to be able to implement it in their habits at home, education must provide them with opportunities to learn in the real world. According to Gaol (2022), basic education lays the foundation for instilling intellectual, emotional, and social intelligence, which underlies lifelong learning. Mathematics is a major subject in basic education. Learning mathematics is very important (Savriliana et al., 2020).

Because mathematics is a topic of reasoning and knowing it can help students develop their talents, mathematics is a subject that can be used to help students build their personalities. At any level of education, being proficient in mathematics can help you develop a positive attitude when studying other subjects (Pasinggi & Thuken, 2019).

Numbers, computation, numerical problems, quantities, patterns, shapes, and structures are all fundamental to the discipline of mathematics. In addition to serving as the foundation for other systems and tools, mathematics is also a thinking tool. This shows that mathematics covers more than just numbers; it also involves analytical and practical skills (Nurhasanah, 2024). One of the main disciplines that should be studied in elementary school is mathematics. Learning mathematics helps students become more critical, logical, and creative thinkers, which is very helpful when facing challenges in everyday life. In line with the opinion of (Fadhilah et al., 2019) which states that various activities offer students learning experiences to help them acquire the competencies they need. This includes understanding mathematical principles and the ability to use them to solve routine problems. It is important to master the various challenges that exist in everyday life, as well as understand mathematical concepts, so that mathematics learning is successful. Students usually concentrate on personal abilities when solving problems and achieving correct results, with limited opportunities to collaborate and dialogue with their friends.

Based on observations made on the teaching and learning process at Sanggar Belajar Pandan Malaysia, researchers found problems in the mathematics learning process. Assignments and lectures are the methods used during the learning process. To reduce students' interest in learning mathematics, teachers can include questions and answers at the beginning or end of class. Lack of focus on students, lack of learning strategies that encourage student participation, and some students still appear passive and have difficulty understanding the subjects taught by the teacher, so that students have poor learning outcomes.

The method used in this study is to include the culture in the place where students live, to provide a learning environment that feels realistic, which will increase students' willingness to learn mathematics. The formation of character based on noble cultural values is influenced by education and culture, which greatly determines the growth and development of the noble values of our country (Nurliastuti et al., 2018). Therefore, a mathematics teaching method is needed that integrates local culture. The media portraying Kincir personalities aids in what is referred to as culturally responsive teaching. One method of teaching that incorporates cultural identity into the educational process is called culturally responsive teaching. (Zulaeha et al., 2024). In the learning studio, where students will develop an understanding of cultural variety and how it is incorporated into learning materials, the Culturally Responsive Teaching model with the use of the number wheel media has the potential to enhance mathematics learning outcomes. By integrating students' cultural elements and using media that can visualize mathematical concepts concretely, the learning process becomes more effective and enjoyable. The Culturally Responsive Teaching model is an educational approach that recognizes and appreciates cultural diversity in the classroom, with the aim of increasing student engagement and learning relevance. This model links learning materials to students' cultural experiences, making learning more meaningful and interesting for them (Khasanah, 2023). Culturally Responsive Teaching helps students to establish cultural connections with meaning to instill knowledge, skills, and character. (Miskiyyah & Buchori, 2023). Teachers can be learning facilitators only but also act as guides who can introduce and explore the material that will be taught to students. With this, each student can feel comfortable during the learning process using concrete media, one of which is the Number Wheel Media and students actively participate in the learning process. The Knowledge Number Wheel (CHIPPING) is a learning tool used. A rotating wheel containing numbers and a bag containing questions about the subject matter that will be taught to students is an example of a visual learning tool from Kicaun Media in the form of a game.

The Influence of Culturally Responsive Teaching Learning Model with Number Wheel Media on Mathematics Learning Outcomes at Pondok Malaysia Learning Center Students Perception on the Use of Speech Texter Application in Teaching Pronunciation Skills

What is meant by 'number wheel' is an educational game

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tool (APE) in the form of a circle resembling a Ferris wheel and a windmill that can be rotated and played by students (Fadila et al., 2023). The number wheel media that can help students in the learning center improve their numeracy skills. The number wheel media is a learning media using a number wheel to illustrate the calculation process or number patterns in their culture that can help students better understand arithmetic operations in mathematics learning, making it easier for students to recognize numbers and presented as a game.

Previous research by Lusida et al. (2024) has provided empirical evidence regarding the effectiveness of the Culturally Responsive Teaching approach which has a positive impact on improving the learning outcomes of grade IV students in science subjects. Similar findings were also reported by Hernita et al. (2024) who noted an increase in the mathematics learning outcomes of grade XI students after using the Culturally Responsive Teaching approach. Considering how learning outcomes are affected by the Culturally Responsive Teaching method, there are positive changes as evidenced by the increased learning outcomes of the Culturally Responsive Teaching learning approach.

There is still little evidence of its influence on elementary school pupils, particularly those in grade II, as the majority of earlier research has concentrated more on secondary or higher education. Furthermore, there hasn't been much thorough research done on the usage of interactive learning materials that are suitable for students' cultural backgrounds. In order to close this gap, this study investigates how well CRT and Kincir Angka media work together to enhance arithmetic learning results for children from a variety of cultural backgrounds.

Culturally responsive teaching is essential in this context because it can help students understand mathematical concepts better through an approach that is relevant to their experiences. By linking learning materials to cultural values that they are familiar with, students will be more motivated and find it easier to understand abstract concepts in mathematics. In addition, this approach creates an inclusive learning environment, where each student feels valued and accommodated according to their cultural background. Thus, the application of the CRT learning model with Kincir Angka media not only improves mathematical understanding but also strengthens student involvement and participation in the learning process.

Studying "The Effect of the Culturally Responsive Teaching Learning Model Assisted by the Number Wheel Media on Mathematics Learning Outcomes in Grade II Students at the Pandan Malaysia Learning Studio" is of interest to the researcher because of the issues that have been raised.

METHOD

This study used a one-group pretest-posttest design in conjunction with a quantitative methodology. This approach's one-group pretest-posttest design has the benefit of being easy to use and able to show how the groups under study have changed. One significant drawback of this approach, though, is the lack of a control group, making it difficult to be certain that the changes that occur are truly due to the treatment and not to other factors, such as time effects or other external factors. Therefore, although this design is useful in preliminary or exploratory research, the results must be interpreted with caution and, where possible, combined with other methods to increase the validity of the study.

Students undergo a pre-test before being given treatment and a post-test after the learning is complete. This study took place during the implementation of the KKNI in class II of Sanggar Belajar Pandan Malaysia, especially in mathematics subjects with a focus on the topic of addition and subtraction. Data collection began in August 2024, with a research instrument in the form of a written test consisting of 20 multiple-choice questions. The sources of questions in this proposal were taken from several sources, including: from YouTube

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Diligent Learning, Examples of mathematical addition story problems can be found in the Smart Book for Doing Elementary School Mathematics Homework Class II Wahyu Media (2008) and the Book Learning with Friends Elementary School Mathematics Class II owned by the Gakko Tosho Team (2021). Data analysis is the next step after all data is collected. Every piece of information collected is processed so that a conclusion can be drawn. The researcher used quantitative data analysis. The way to arrange data sequences in a size and pattern to arrive at a conclusion is known as quantitative data analysis.

FINDINGS AND DISCUSSION

Testing the research tool is the initial step in the research process. This instrument was tested to determine its degree of validity and reliability before to being utilized as a research data collection tool. The instruments utilized in this study were assessed using the computation procedures for the validity and accuracy tests. Research-useful instruments are those that satisfy the criteria of the instrument trial results. The specifics of the test instruments analyzed in this study include 20 question items.

Validity Test Results

Only 12 of the 20 test items that were evaluated in class II of Sanggar Belajar Pandan Malaysia can be used, according to the findings of the validity test of the questionnaire instrument using the correlation formula with the aid of IBM SPSS Statistics 20. Given a significant value of 0.05, a statement is considered valid if r count > r table; conversely, if r count < r table, the statement is considered invalid. Thirteen students used the test instrument, yielding a 0.05 r table. Table 1.1 displays the instrument validation analysis.

Table 1. Test of Question Instrument Validity

Item	Sig. table value (0.05)	Sig.count Value	Status
Item 1	0.05	0,000	Valid
Item 2	0.05	0.243	Invalid
Item 3	0.05	0.010	Valid
Item 4	0.05	0.037	Valid
Item 5	0.05	0.014	Valid
Item 6	0.05	0.150	Invalid
Item 7	0.05	0.028	Valid
Item 8	0.05	0.374	Invalid
Item 9	0.05	0.010	Valid
Item 10	0.05	0.202	Invalid
Item 11	0.05	0.010	Valid
Items 12	0.05	0.931	Invalid
Items 13	0.05	0.113	Invalid
Items 14	0.05	0,000	Valid
Items 15	0.05	0.010	Valid
Items 16	0.05	0.010	Valid

Items 1 7	0.05	0.186	Invalid
Items 1 8	0.05	0.010	Valid
Items 1 9	0.05	0.101	Invalid
Item 20	0.05	0,000	Valid

Validity Test Results

Following the completion of validity test measures, reliability testing comes next. The results of this reliability test measurement are valid for the questionnaire instrument. The reliability test's objective is to ascertain the degree of trustworthiness of a measurement's findings. Using IBM SPSS Statistics 20, the Cronbach's Alpha statistical test is used to assess the questionnaire instrument's reliability. The Cronbach's Alpha value, as determined by SPSS computations, is 0.736> 0.6. Thus, it can be said that every thing is deemed consistent or dependable. Table 1.2 displays the results of the instrument reliability investigation.

Table 2. Reliability Test of Question Instruments

Reliability Statistics

Cronbach's Alpha	N of Items
0.738	21

Hypothesis Test Results

This study uses a t-test to test the hypothesis using a sample of thirteen people. To ensure whether this study has an impact, the results below will be very helpful. The basis for making t-test decisions is as follows:

If the significance value (2-tailed) <0.05, then Ha is accepted and Ho is rejected.
If the significance value (2-tailed) > 0.05 then Ha is rejected and Ho is accepted.

In the t-test used is the Independent Sample t-test with the help of IBM SPSS Statistics 20.

Table 3. Hypothesis Testing

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	58.00	13	13,178	3.655
	Posttest	79.23	13	13,504	3,745

Based on the table output above, the t-test data in the table shows that there is a significant influence on the grades of second-grade students of Sanggar Belajar Pandan Malaysia after using the Culturally Responsive Teaching learning model assisted by the number wheel media with the results (M = 79.23, SD = 13.504) and the grades of students before using the Culturally Responsive Teaching learning model assisted by the number wheel media with (M = 58.00, SD = 13.178), sig value (2-tailed) = 0.000 <0.05, then the results of Ha are accepted and Ho is rejected. Therefore, there is a contrasting change when using the Culturally Responsive Teaching learning model assisted by the number wheel media on the

mathematics learning outcomes of second-grade students at Sanggar Belajar Pandan Malaysia which is higher than using conventional learning methods.

Table 4. Hypothesis Testing Output

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	Pretest - Posttest	-21,231	16,654	4.619	-31,295	-11,167	-4,596	12	.001

Students in the second grade at Pandan Learning Studio Malaysia participated in the study that was carried out by the researcher. The researcher wants to know how the number wheel media supports the "Culturally Responsive Teaching" learning approach and how it affects students' learning results in mathematics.

This study looked at a number of elements associated to student learning outcomes in mathematics in order to determine the findings of the research done utilizing the "Culturally Responsive Teaching" learning paradigm backed by the number wheel medium. Twelve questions were used to examine the form of the instrument used to measure student learning outcomes in mathematics. Prior to implementing the model, the instrument was tested using item analysis. The instrument was examined using a number of statistical tests, including expert validity and reliability tests. According to the findings, students who used the "Culturally Responsive Teaching" learning model with the help of the number wheel media.

Instructors must be mindful of the practice time. Every learning model, technique, and strategy must have pros and cons, just like the Culturally Responsive Teaching learning model backed by the Number Wheel medium. Teachers must first understand the benefits and drawbacks of the Culturally Responsive Teaching learning model before utilizing it with the Number Wheel media. If teachers are already familiar with the Culturally Responsive Teaching learning approach, they can use the number wheel medium to reduce its drawbacks. Beyond the Culturally Responsive Teaching learning model with the use of the number wheel media, knowledge of other theories, methods, and learning strategies is also required. Using the Culturally Responsive Teaching learning paradigm has a significant impact on the grades of Sanggar Belajar Pandan Malaysia class II pupils, according to the t-test results in the table. With the help of the number wheel media, the grades and results (M = 79.23, SD = 13.504) of pupil a prior to utilizing the Culturally The number wheel medium in mathematics supports the responsive teaching and learning methodology. Sanggar Belajar Pandan Malaysia's class II kids' learning outcomes, which are superior to traditional education.

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In this study, there were several obstacles to the research that had been carried out, one of which was the limited research space. Sanggar Belajar Pandan Malaysia functions as a place of research, and is the only location where the research was conducted. There are several variations in the findings if the research was conducted elsewhere. However, the possibility is not significantly different from the findings of the research conducted. Then, due to time constraints, this research was conducted simultaneously with the writing of this thesis. One thing that may limit the research area is time constraints. In the end, there are restrictions associated with the items examined in this study. This study's primary goal is analysis. The impact of the number wheel medium and the Culturally Responsive Teaching learning model on the mathematical learning results of class II pupils at the Pandan Learning Center in Malaysia.

The number wheel media in the Culturally Responsive Teaching (CRT) model improves mathematics learning outcomes because it can increase student engagement and help visualize mathematical concepts. As an interactive tool, the number wheel allows students to actively participate in learning, thereby increasing their motivation and understanding of the material. In addition, this tool helps visualize the relationship between numbers and mathematical operations, which is very important for grade II students who are still at the concrete cognitive development stage. In this way, abstract concepts become easier to understand, speeding up the learning process, and improving students' memory of the material being taught.

In the context of Culturally Responsive Teaching, the number wheel can also be adapted to local cultural elements at Sanggar Belajar Pandan Malaysia, such as the use of colors, symbols, or numbers that have meaning in students' daily lives. This cultural integration makes learning more relevant and meaningful, so that students feel closer to the material being studied. With this approach, mathematics learning not only becomes more interesting, but also more effective in improving student learning outcomes, because they can connect new concepts with their own experiences and environments.

CONCLUSIONS

The Kincir Angka (Number Wheel) medium, in conjunction with the Culturally Responsive Teaching (CRT) learning approach, significantly improves the mathematical learning results of second-grade pupils at Sanggar Belajar Pandan, Malaysia. The CRT approach improves conceptual understanding and learning motivation by customizing teaching strategies to fit students' cultural backgrounds and life experiences. The use of Kincir Angka as an interactive learning tool further supports students in grasping mathematical concepts in a concrete and engaging manner. Empirical evidence from the study shows a notable increase in students' average cognitive learning outcomes, rising from 58.00 before the treatment to 79.23 after the implementation of the CRT model. Moreover, statistical analysis confirms the effectiveness of this approach, with a significance value of 0.000, which is less than the threshold of 0.05, indicating a substantial impact of the CRT model on students' performance. Thus, integrating culture-based pedagogy with interactive media presents an effective strategy for enhancing student achievement in mathematics.

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