Integrating Digital Technology into Traditional Game-Based Learning to Cultivate Local Wisdom Values among Elementary School Students in Bantul, Indonesia

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***Abstract*—The global pandemic has caused the need for adaptation and innovation in learning methods. In the post-pandemic era, integrating digital technology with traditional approaches such as Game-Based Learning (GBL) has become increasingly important as it not only enhances the quality of learning in an engaging and interactive way, but also enriches students' experience with relevant cultural and traditional values. By blending locally adapted GBL elements with digital technologies, educators can create a learning environment that supports a deeper understanding of cultural heritage. The purpose of the study was to analyze the potential use of digital technology in the context of GBL in strengthening local wisdom values. This study used a quantitative method with a pre-test and post-test design, while the research subjects used a random sample technique of 54 respondents consisting of fifth grade elementary school students. A questionnaire design was conducted to collect data to measure the effectiveness of the system implementation, while data analysis was used to analyze the effectiveness of the system. The result of the research is that the GBL approach has great potential and strengthens cultural identity and expands students' understanding of local values in the post-pandemic era. This research contributes in providing insights to enhance local wisdom values through GBL, while the implication is that the system implementation must be supported by adequate technological infrastructure and teacher support to ensure its effectiveness. In conclusion, the integration of digital technology in GBL can be a powerful instrument to cultivate local wisdom, bridge the gap in learning, and prepare future generations in a holistic and sustainable way.**

***Keywords*—game-based learning, digital technology, local wisdom, post-pandemic**

I. Introduction

The development of information technology has had a significant impact, especially in the education sector [1], physical restrictions and widespread school closures are forcing teachers and students to turn to distance learning. Various limitations aimed at minimising the spread of the virus among learners and educators have led to learning loss. In anticipation of the learning loss, the government issued a policy to simplify the curriculum into an independent curriculum, which is a curriculum under special conditions since 2020 and was declared effective in mitigating learning loss during pandemic [2].

Limited social interaction and traditional learning experiences lead to challenges in teaching and understanding cultural values and local wisdom [3–7]. As we move into the post-pandemic era and society 5.0, major challenges arise in trying to recover and rebuild the affected education system to not only see recovery as a search for a return to previous routines[7, 8], but as an opportunity to renew and improve education to make it more relevant to future demands [9–11]. The era of society 5.0 education must prepare students to face an increasingly digitalized world [12–14], hence the need for innovation in learning methods to overcome this challenge and ensure that local values remain relevant [15–17].

The development of digital technologies, such as Augmented Reality (AR), Virtual Reality (VR), and artificial intelligence, opens up new opportunities in learning. The Game-Based Learning approach has been proven effective in increasing student engagement and facilitating concept understanding [17–19]. Digital technology in game-based learning [9, 20–22] provide opportunities to create learning experiences that are engaging, interactive, and relevant to students' daily lives post-pandemic and society 5.0 [23–25]. This not only helps to overcome the challenges of distance learning [26–29], but also provides an opportunity to re-establish ties with local wisdom values that may be overlooked in conventional curriculum development [30–32]. This not only helps overcome the challenges of distance learning, but can also enhance the impact on academic achievement [26, 27, 29, 33], as well as support learning satisfaction [34–37] and assist students in improving their thinking processes [21, 37, 38]. Learning in enhancing understanding using Augmented Reality (AR) [39–41], not only provides opportunities to rebuild connections with local wisdom values that may have been overlooked in conventional curriculum development. The innovation of digital [42] technology in traditional game-based learning is an interesting and relevant alternative to blend traditional wealth with technological advancement [33, 43, 44].

Education based on local wisdom values, traditions, and cultural identity, the expansion of the role of digital technology is inevitable, because young people as the next generation need education that not only fulfils academic needs, but also enriches local values that form the foundation of culture[45]. There is a need to combine local wisdom and traditional culture with digital technology innovation[46]. Creating an educational game that combines traditional elements with modern technology can be a relevant

solution[47, 48]. Local wisdom and cultural values are often threatened by social and technological changes[45, 46]. The research aims to respond to post-pandemic learning challenges by presenting digital technology innovations that not only enable recovery, but also strengthen and cultivate local wisdom values, detailing this background hopes to provide valuable contributions in designing an education system that is adaptive and responsive to current and future needs.

The urgency of this research lies in the pressing need to adapt traditional learning methods amidst the rapid development of digital technology. With the increasing use of technology in education, it is important to explore how digital innovations can be integrated into GBL to not only increase student engagement, but also to preserve and instill local wisdom values.

This research has great significance in scientific development because (1) Development of learning methods: This research contributes to the development of more effective and relevant learning methods with local cultural context, which can improve student learning outcomes. (2) Preservation of Local Wisdom: By integrating local wisdom values into game-based learning, this research helps preserve cultures and traditions that may be threatened by globalization. (3) Innovation in Education: This research also provides new insights into how digital technology can be used to create a more interactive and engaging learning experience, which is crucial in the modern educational context. As such, this research is not only relevant for educational development, but also for cultural preservation and improving the quality of learning in the digital age.

In this study, we strive to examine how digital technology may influence traditional game-based learning toward the development of local wisdom values during the post-pandemic era. The specific research purposes are as follows:

1) To identify significant factors influencing the integration of digital technology into traditional game-based learning.
2) To find out the effect of digital game-based learning on the students' perception of the values of local wisdom.
3) To identify the perception of elementary school kids regarding whether digital technology usage has assisted in enhancing their learning experience.

The questions guiding this investigation are:

1) What are the major effects impacting the inclusion of digital technology on traditional game-based learning?
2) How does digital game-based learning influence the learning of local wisdom values by the students?
3) What do primary school pupils perceive regarding the role of digital technology in their learning process.

This new addition will provide us with a proper format for our study and make better sense of our research significance and goals.

II. METHODS

A. Research Desain

The research method used is the quantitative-experimental method, which in the process has the aim of knowing the effect of a particular treatment, as well as testing the hypothesis that has been set by the researcher. To test the hypothesis, researchers need to identify the variables that are the focus of this study.

The research was conducted at Sekolah Dasar Islam Terpadu Insan Utama Yogyakarta, located on Brawijaya Street, Gatak, Tamantirto, Kasihan, Bantul, Yogyakarta Special Region. The research subjects consisted of fifth-grade students, total 54 students. The sample was selected using a random sampling technique, which was conducted to ensure that every student had an equal chance of being included in the study. This method helps to minimize bias and enhances the representativeness of the sample. The experiments were carried out over a period from February to April 2024. This timeframe was chosen to allow sufficient time for participant recruitment, data collection, and analysis.

Each experiment session was structured as follows:

1) Initial briefing: participants were given an overview of the study's purpose and procedures. This session lasted approximately 15 min.
2) Main activity: participants engaged with the moral dilemma stories, which were presented in two parts. Each session lasted about 45 min, allowing students to read the stories, answer the questions, and provide their conclusions.
3) Debriefing session: after completing the main activity, a debriefing session was held to discuss the participants' experiences and gather any additional feedback. This session lasted around 15 min.

Data were collected through the Defining Issue Test (DIT), which included five moral dilemma stories based on Kohlberg's theory. Participants were required to read each story and respond to a series of questions designed to assess their moral reasoning.

B. Participant

The population in this study were fifth grade students at Sekolah Dasar Islam Terpadu Insan Utama Yogyakarta consisting of classes V-A, and V-B. The number of samples for each class was 27 students from both the control and experimental classes. Class V-A was chosen as the control class that was not given any treatment and class V-B as the experimental class.

The control group will receive traditional learning methods without the integration of digital technology, thus allowing a clear comparison of the effectiveness of technological innovation in GBL, while the experimental class will receive learning methods with the integration of digital technology described in Table 1. In this way, the research can evaluate the specific impact of using digital technology in improving understanding and appreciation of local wisdom values among learners.

Table 1. Experiment design model pre-test post-test control group design

Group	Description		
	Pre-Test	**Treatment**	**Post-Test**
Experiment	O_1	X	O_2
Control	O_3	-	O_4

Description:
O_1: Pre-test (experiment group)
O_2: Post-test (experiment group)
O_3: Pre-test (control group)
O_4: Post-test (control group)
X: Treatment (traditional games based-learning)

C. Procedure

Application development using the waterfall method [49–

51] where the research is carried out sequentially starting from data collection, design, implementation, verification to maintenance. The flow of experimental development will be carried out can be seen in Fig. 1.

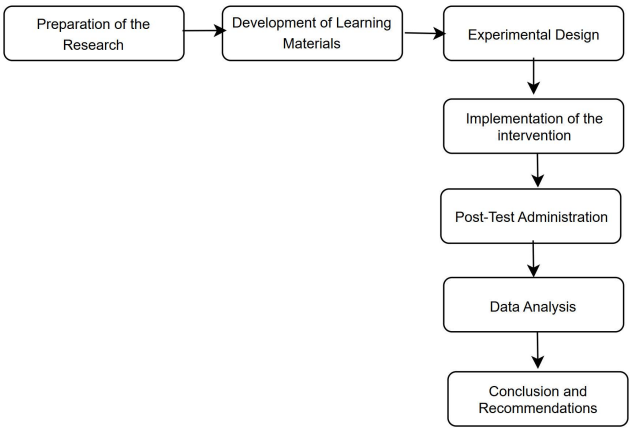

Fig. 1. System development flowchart.

Description:

1) Preparation of the Research

Determine the research objectives, which are to explore the innovation of digital technology in traditional game-based learning to develop local wisdom values.

Subject Selection: select participants for the study, ensuring a diverse representation of the target population.

2) Development of Learning Materials

Create digital tools and resources that integrate traditional games with technology, ensuring they align with local cultural values. Conduct a pilot test of the learning materials with a small group to gather feedback and make necessary adjustments.

3) Experimental Design

Group Assignment: randomly assign participants into two groups: the experimental group (using digital technology in traditional game-based learning) and the control group (using traditional methods without digital integration).

Pre-Test Administration: administer a pre-test to both groups to assess their initial understanding of local wisdom values.

4) Implementation of the Intervention

Implement the learning sessions for both groups over a specified period, ensuring that the experimental group engages with the digital tools while the control group follows traditional methods.

5) Post-Test Administration

After the intervention, administer a post-test to both groups to measure any changes in understanding and appreciation of local wisdom values.

6) Data Analysis

Use appropriate statistical methods to compare pre-test and post-test results between the experimental and control groups, assessing the effectiveness of the digital technology integration.

7) Conclusion and Recommendations

Draw Conclusions: based on the data analysis, draw conclusions regarding the impact of digital technology on traditional game-based learning and its effectiveness in cultivating local wisdom values.

Make Recommendations: provide recommendations for educators and policymakers on integrating digital technology in traditional learning contexts.

D. Research Instruments

This research instrument uses the DIT to see how a person views in resolving a situation that contains moral dilemma issues. The measuring instrument will be given to the subject in the form of five moral dilemma stories created based on experiential learning theory [52] with a number of questions on each story. Before filling in the questions, participants are required to read first, each story has two parts that must be filled in by the participants. In the first part, participants are asked to choose one answer from five choices of moral dilemma questions and the second part students provide a conclusion statement why they chose the question. The development of a person's moral reasoning will be known through the prominent value after conducting DIT describe in Table 2.

Table 2. DIT assessment grid

Aspect	Description		
	Indicator	**Sub-indicator**	**Question**
Moral Judgment	Pre-conventional reasoning level	Compliance and punishment orientation	Number 1, Dilemma Stories I, II, III, IV, V
		Self-interest orientation (What's in it for me?)	Number 2, Dilemma Stories I, II, III, IV, V
	Conventional reasoning level	Interpersonal harmony and conformity orientation (Positive behaviour of children)	Number 3, Dilemma Stories I, II, III, IV, V
		Authority orientation and maintenance of social rules (Morality of laws and rules)	Number 4, Dilemma Stories I, II, III, IV, V
	Post-conventional reasoning level	Community rights and individual rights.	Number 5, Dilemma Stories I, II, III, IV, V
		Universal ethical principles	Number 6, Dilemma Stories I, II, III, IV, V

E. Data Analysis

Data analysis [53] used to determine the effectiveness of traditional game-based learning include (1) Prerequisite test to determine whether the research data is tested statistically parametric or non-parametric. Prerequisite tests are carried out by means of normality tests and homogeneity tests. (2) Normality test to determine whether or not a data distribution is normal. Data normality testing is done by means of the One Sample Kolmogorov-Smirnov test. The test criteria is if the significance value> 0.05 then Ho is rejected. This means that the data has a normal distribution. (3) Homogeneity test to determine whether the sample data obtained in the study has a homogeneous variance or not. Data normality testing is done by means of the Test of Homogeneity of Variance. The test criterion is if the significance value > 0.05 then Ho is rejected. This means that the data has a homogeneous variance. (4) Statistical tests to determine differences if the data has a normal distribution and homogeneous variance, then a parametric statistical test can be carried out. Meanwhile, if the data is not normally distributed, then a non-parametric statistical test is carried out. Uji Independent Sample-t Test, in the hypothesis test with the independent sample t test, it is used to compare the average of two groups (experimental group and control group) which have the same average or not. The data analysis technique in this study was assisted by using the t-test. Calculation. The t-test was used

to test the difference in morale between the experimental group with the application of the traditional game of Gobak-sodor and the control group which was not given the treatment of benthic games only conventional learning. Interpretation of the t-test results by looking at the sig (2-tailed) value, then compared with the significance level of 0.05 (5%). The interpretation of the t-test is as follows:

1) If the sig (2-tailed) value is greater than the significance level of 0.05 (sig (2-tailed) > 0.05), there is no positive and significant difference between the experimental group and the control group.
2) If the sig value (2-tailed) is greater than the significance level of 0.05 (sig (2-tailed) < 0.05), there is a positive and significant difference between the experimental group and the control group.

III. Result and Discussion

A. Result

1) Validity test

The validity test is conducted with the aim of determining the extent to which the accuracy and precision of an instrument in performing its measurement function. The validity test used in this study is the product moment correlation validity test. The results of the Analysis of the Validity Test of the Research Instrument Validity in this study are as follows describe in Table 3:

Table 3. Validity test

Correlations		Q-1	Q-2	Q-3	Q-4	Q-5	Total
Question-1	Pearson Correlation	1	0.437*	0.228	0.214	−0.038	0.530**
	Sig. (2-tailed)		0.023	0.253	0.283	0.852	0.004
Question-2	Pearson Correlation	0.437*	1	0.625**	0.232	−0.031	0.506**
	Sig. (2-tailed)	0.023		0.000	0.244	0.877	0.007
Question-3	Pearson Correlation	0.228	0.625**	1	0.452*	0.059	0.517**
	Sig. (2-tailed)	0.253	0.000		0.018	0.771	0.006
Question-4	Pearson Correlation	0.214	0.232	0.452*	1	0.111	0.582**
	Sig. (2-tailed)	0.283	0.244	0.018		0.583	0.001
	N	27	27	27	27	27	27
Question-5	Pearson Correlation	−0.038	−0.031	0.059	0.111	1	0.560**
	Sig. (2-tailed)	0.852	0.877	0.771	0.583		0.002
Total	Pearson Correlation	0.530**	0.506**	0.517**	0.582**	0.560**	1
	Sig. (2-tailed)	0.004	0.007	0.006	0.001	0.002	
	N	27	27	27	27	27	27

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Based on the data from the product moment validation analysis above, it is known that all items are valid.

2) Reliability test

Reliability testing is conducted with the aim of assessing the accuracy or consistency of the tool in evaluating what it measures. The reliability test in this study was conducted using Cronbach's Alpha, with the following criteria for assessing the level of reliability describe in Table 4:

Table 4. Reliability test

Cronbach's Alpha	N of Items
0.512	5

Based on the Table 4, it is known that the reliability value of the questions is 0.512, which falls into the fairly reliable category.

3) Normalitas test

The following table shows the results of normality calculations using the one sample Kolmogorov–Smirnov test. Based on the output of the normality test carried out, if the significant value is greater than α=0.05, it can be concluded that the research data is normally distributed, but if the sig value <α=0.05, it can be concluded that the research data is not normally distributed. The following is the data from the Kolmogorov-Smirnov test results.

From the Table 5, output results of the Kolmogorov-Smirnov normality test pre-test and post-test of the control and experimental classes. The significant value (sig) on the experimental class pretest is 0.200>0.05, the significance value of the experimental class posttest is 0.137>0.05, the significance value of the control class pretest is 0.062>0.05 and the significance value of the control posttest class is 0.070>0.05. Based on this, it can be seen that the significant value (sig) of the pretest and posttest results of learning moral judgement development in Gobak-sodor is greater than 0.05, therefore it can be concluded that the data is normally distributed.

Table 5. Normality test calculation results pre-test and post-test control and experiment classes

Class		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Student Learning Outcomes	Pre-Test experimental	0.135	27	0.200*	0.894	27	0.010
	Post-Test experimental	0.147	27	0.137	0.912	27	0.026
	Pre-Test Control	0.163	27	0.062	0.913	27	0.027
	Post-Test Control	0.161	27	0.070	0.918	27	0.036

*. This is a lower bound of the true significance.

4) Homogeneity test

Homogeneity test is used to determine the similarity between two conditions or populations. The homogeneity test used in this study is the Levene test. Levene's test is a method of testing the homogeneity of variances The following table of Homogeneity calculation results using the test of

homogeneity of variances gets the following results describe in Table 6.

Table 6. Results of homogeneity test calculation of pretest of Control I and Experiment I Classes

Homogeneity		Levene Statistic	df1	df2	Sig.
Student Learning Outcomes	Based on Mean	0.620		1	0.434
	Based on Median	0.634		1	0.429
	Based on Median and with adjusted DF	0.634		1	0.429
	Based on trimmed mean	0.644		1	0.426

The results of the Table 6, Homogeneity Test Calculation of the Control Class Pretest I from the Homogeneity of Variances output results obtained the Levene Statistic value above with a Sig. value greater than 0.05, so it can be stated that the control class pretest and experimental class pretest scores come from a homogeneous population and experiment I.

From the Homogeneity of Variances output results, the Levene Statistic value above is obtained with a Sig. value greater than 0.05, so it can be stated that the control class pretest and experimental class pretest scores come from a homogeneous population.

5) Hipotesis test

After the normality test and homogeneity test are carried out, data analysis is carried out to test the hypothesis that has been proposed, this test is carried out to determine whether there is a significant difference between students who are treated with the traditional Gobak-sodor game model in improving moral judgment. The post-test homogeneity test results are presented in Table 7. In the next final data test, namely by using the t test (sample t-tests hypothesis test) as follows:

Table 7. Calculation results of post-test homogeneity test of Control II and Experiment II Classes

Homogeneity		Levene Statistic	df1	df2	Sig.
Student Learning Outcomes	Based on Mean	0.885	1	52	0.351
	Based on Median	0.530	1	52	0.470
	Based on Median and with adjusted DF	0.530	1	50.926	0.470
	Based on trimmed mean	0.789	1	52	0.379

Table 8. Independent hypothesis test results

		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	DF	Sig. (2)	Mean Difference	Std. Error	95% Confidence Lower	95% Confidence Upper
Student Learning Outcomes	Equal variances assumed	0.211	0.648	2.023	52	0.048	0.815	0.403	0.007	1.623
	Equal variances not assumed			2.023	51.776	0.048	0.815	0.403	0.007	1.623

From the Table 8, output of the independent sample t-test test above based on the data of the control class and experimental class students' scores, it can be seen in the hypothesis test calculation column that the Asymp. Sig (2-tailed) 0.048 > 0.05 which means Ha is accepted and H0 is rejected, because of that it can be concluded that there is a difference in the development of moral judgement owned by students who apply the traditional game learning model of Gobak-sodor experimental class with conventional learning control class.

6) Frequency distribution

To find out the difference in the learning model of the traditional game of Gobak-sodor towards building students' moral judgement. The following are the results after learning using the concept of the traditional game of Gobak-sodor.

a) Control class

The following diagram is the frequency of the control class which was filled by 27 learners with enthusiasm and earnestness.

Based on the Table 9, there are 12 learners (44.44%) who enter the moral level of obedience and punishment orientation, 3 learners (11.11%) who enter the moral level of personal interest orientation, 5 learners (18.53%) interpersonal harmony and conformity, 3 learners (11.11%) enter the moral level of authority orientation and maintenance of social rules, 1 learner (3.70%) enters the fifth stage moral level which is community rights and individual rights, and 3 learners (11.11%) enter the sixth stage level which is universal ethical principles.

Table 9. Category of moral reasoning tendency post-test problem 1 control group

Category of Moral Reasoning Tendency	Learners	Percentace
Compliance and punishment orientation	12	44.44
Personal interest orientation	3	11.11
Interpersonal harmony and conformity	5	18.53
Authority orientation and maintenance of rules and social	3	11.11
Community Rights and Individual Rights	1	3.7
Universal ethnic principles	3	11.11

Based on the Table 10, there are 1 learner (3.70%) who is included in the moral level of obedience and punishment orientation, 8 learners (29.63%) who are included in the moral level of personal interest orientation, 7 learners (25.93%) interpersonal harmony and conformity, 3 learners (11.11%) are included in the moral level of authority orientation and maintenance of social rules, 3 learners (11.11%) are included in the fifth stage moral level which is community rights and individual rights, and 5 learners (18.52%) are included in the sixth stage level which is universal ethical principles.

Based on the Table 11, there are 1 learner (3.70%) who

enters the moral level of obedience and punishment orientation, 5 learners (18.52%) who enter the moral level of personal interest orientation, 6 learners (22.22%) interpersonal harmony and conformity, 5 learners (18.52%) enter the moral level of authority orientation and maintenance of social rules, 8 learners (29.63%) enter the fifth stage moral level which is community rights and individual rights, and 2 learners (7.41%) enter the sixth stage level which is universal ethical principles.

Table 10. Category tendency of moral reasoning post-test problem 2 control group

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	1	3.70
The moral level of personal interest orientation	8	29.63
Interpersonal harmony and conformity	7	25.93
The moral level of authority orientation and maintenance of social rules	3	11.11
The fifth stage moral level which is community rights and individual rights	3	11.11
The sixth stage level which is universal ethical principle	5	18.52

Table 11. Category tendency of moral reasoning post-test question 3 control group

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	1	3.70
The moral level of personal interest orientation	5	18.52
Interpersonal harmony and conformity	6	22.22
The moral level of authority orientation and maintenance of social rules	5	18.52
The fifth stage moral level which is community rights and individual rights	8	29.63
The sixth stage level which is universal ethical principles.	2	7.41

Based on the Table 12, there are 1 learner (3.70%) who enters the moral level of obedience and punishment orientation, 6 learners (22.22%) who enter the moral level of personal interest orientation, 2 learners (7.41%) interpersonal harmony and conformity, 7 learners (25.93%) enter the moral level of authority orientation and maintenance of social rules, 5 learners (18.52%) enter the fifth stage moral level which is community rights and individual rights, and 6 learners (22.22%) enter the sixth stage level which is universal ethical principles.

Table 12. Control group post-test moral reasoning tendency category question 4

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	1	3.70
The moral level of personal interest orientation	6	22.22
Interpersonal harmony and conformity	2	7.41
The moral level of authority orientation and maintenance of social rules	7	25.93
The fifth stage moral level which is community rights and individual rights	5	18.52
The sixth stage level which is universal ethical principles.	6	22.22

Based on the Table 13, there are 8 learners (29.63%) who enter the moral level of obedience and punishment orientation, 3 learners (11.11%) who enter the moral level of personal interest orientation, 0 learners (0%) interpersonal harmony and conformity, 2 learners (7.41%) enter the moral level of authority orientation and maintenance of social rules, 4 learners (14.81%) enter the fifth stage moral level which is community rights and individual rights, and 10 learners (37.04%) enter the sixth stage level which is universal ethical principles.

Table 13. Control group post-test moral reasoning tendency category question 5

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	8	29.63
The moral level of personal interest orientation	3	11.11
Interpersonal harmony and conformity	0	0
The moral level of authority orientation and maintenance of social rules	2	7.41
The fifth stage moral level which is community rights and individual rights	4	14.81
The sixth stage level which is universal ethical principles.	10	37.04

b) Experiment class

The following is the frequency of the experimental class which was filled in by 27 students with enthusiasm and earnestness.

Based on the Table 14, there are 10 learners (37.04%) who enter the moral level of obedience and punishment orientation, 2 learners (7.41%) who enter the moral level of personal interest orientation, 6 learners (22.2%) interpersonal harmony and conformity, 5 learners (18.52%) enter the moral level of authority orientation and maintenance of social rules, 0 learners (0%) enter the fifth stage moral level which is community rights and individual rights, and 4 learners (14.81%) enter the sixth stage level which is universal ethical principles.

Based on the Table 15, there are 3 learners (11.11%) who enter the moral level of obedience and punishment orientation, 7 learners (25.93%) who enter the moral level of personal interest orientation, 8 learners (29.63%) interpersonal harmony and conformity, 5 learners (18.52%) enter the moral level of authority orientation and maintenance of social rules, 1 learner (3.70%) enters the fifth stage moral level which is community rights and individual rights, and 3 learners (11.11%) enter the sixth stage level which is universal ethical principles.

Table 14. Trend category of post-test moral reasoning question 1 experimental group

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	10	37.04
The moral level of personal interest orientation	2	7.41
Interpersonal harmony and conformity	6	22.22
The moral level of authority orientation and maintenance of social rules	5	18.52
The fifth stage moral level which is community rights and individual rights	0	0
The sixth stage level which is universal ethical principles.	4	14.81

Table 15. Trend category of moral reasoning post-test problem 2 experimental group

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	3	11.11
The moral level of personal interest orientation	7	25.93
Interpersonal harmony and conformity	8	29.63
The moral level of authority orientation and maintenance of social rules	5	18.52
The fifth stage moral level which is community rights and individual rights	1	3.70
The sixth stage level which is universal ethical principles.	3	11.11

Based on the Table 16, there are 1 learner (3.70%) who enters the moral level of obedience and punishment orientation, 3 learners (11.11%) who enter the moral level of personal interest orientation, 7 learners (25.93%) interpersonal harmony and conformity, 7 learners (25.93%) enter the moral level of authority orientation and maintenance of social rules, 8 learners (29.63%) enter the fifth stage moral level which is community rights and individual rights, and 1 learner (3.70%) enter the sixth stage level which is universal ethical principles.

Table 16. Trend category of moral reasoning post-test problem 3 experimental group

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	1	3.70
The moral level of personal interest orientation	3	11.11
Interpersonal harmony and conformity	7	25.93
The moral level of authority orientation and maintenance of social rules	7	25.93
The fifth stage moral level which is community rights and individual rights	8	29.63
The sixth stage level which is universal ethical principles.	1	3.70

According to the Table 17, there are 0 learners (0%) who enter the moral level of obedience and punishment orientation, 7 learners (25.93%) who enter the moral level of personal interest orientation, 3 learners (11.11%) interpersonal harmony and conformity, 5 learners (18.52%) enter the moral level of authority orientation and maintenance of social rules, 5 learners (18.52%) enter the fifth stage moral level which is community rights and individual rights, and 7 learners (25.93%) enter the sixth stage level which is universal ethical principles.

Table 17. Categories moral penalty post-test question 4 experimental groups

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	0	0
The moral level of personal interest orientation	7	25.93
Interpersonal harmony and conformity	3	11.11
The moral level of authority orientation and maintenance of social rules	5	18.52
The fifth stage moral level which is community rights and individual rights	5	18.52
The sixth stage level which is universal ethical principles.	7	25.93

According to the Table 18, there are 6 learners (22.22%) who enter the moral level of obedience and punishment orientation, 3 learners (11.11%) who enter the moral level of personal interest orientation, 0 learners (0%) interpersonal harmony and conformity, 2 learners (7.41%) enter the moral level of authority orientation and maintenance of social rules, 5 learners (18.52%) enter the fifth stage moral level which is community rights and individual rights, and 11 learners (40.74%) enter the sixth stage level which is universal ethical principles.

Table 18. Trend category of post-test moral reasoning question 1 experimental group 5

Category Tendency of Moral Reasoning Tendency	Learners	Percentace
The moral level of obedience and punishment orientation	6	22.22
The moral level of personal interest orientation	3	11.11
Interpersonal harmony and conformity	0	0
The moral level of authority orientation and maintenance of social rules	2	7.41
The fifth stage moral level which is community rights and individual rights	5	18.52
The sixth stage level which is universal ethical principles.	11	40.74

Based on the descriptive results above, it can be concluded that the moral values contained in the traditional game of Gobak-sodor are in accordance with the indicators in the questionnaire instrument that has been made, namely (1) Compliance and punishment orientation, (2) Personal interest orientation (What is good for me?), (3) Orientation of interpersonal harmony and conformity (Good children's attitudes), (4) Orientation of authority and maintenance of

social rules (Morality of laws and rules), (5) Stage five is the rights of children, (3) Orientation of interpersonal harmony and conformity (good boy attitude), (4) Orientation of authority and maintenance of social rules (Morality of laws and rules), (5) Stage five is community rights and individual rights, (6) Universal ethical principles.

From the results of the questionnaire distribution in the control class, the following results were obtained:

Based on the Table 19, according to the results of filling out the questionnaire in the control class students who were not given the traditional Gobak-sodor game treatment in general, it can be seen that grade V students have moral development as stated by Kohlberg (1968), that at that age is included at the classic level. This assessment was taken based on what they said about the motives for the participants' actions to obey the law and the attitude of personal interest of a child. The example they conveyed in the answers put forward on the moral dilemma obtained, the mode or number that often appears in indicators 2 and 4, namely stating that students have moral values of personal interest orientation and number 4, namely authority orientation and maintenance of social rules. But there are students who have shown that their moral development has reached a high level of level 3 stage 6. But still, when viewed from the results of indicators that often appear, 5th graders are the same as what most students do in stages 2 and 4. Meanwhile, from the distribution of questionnaires in the experimental class, the following results were obtained describe in Table 20:

Table 19. Recapitulation of control class hypothesis testing results

Moral Reasoning Level	Stage of Moral Reasoning	Sum	
		Pre-test	Post-test
Pre-conventional Morality	Obedience and Punishment Orientation	4	2
	Personalized Interest Orientation	6	7
conventional Morality	Interpersonal Harmony Orientation and Conformity	6	5
	Authority Orientation and Maintenance of Social Rules	4	7
Post-conventional Morality	Community Rights and Individual Rights	3	2
	Universal Ethical Principle	4	4

Table 20. Recapitulation of experimental class hypothesis testing results

Moral Reasoning Level	Moral Reasoning Stage	Sum	
		Prettest	Post-test
Pre-conventional Morality	Obedience and Punishment Orientation	6	1
	Personalized Interest Orientation	3	2
conventional Morality	Interpersonal Harmony Orientation and Conformity	4	5
	Authority Orientation and Maintenance of Social Rules	5	7
Post-conventional Morality	Community Rights and Individual Rights	4	5
	Universal Ethical Principle	5	7

According to the data above, there is an improvement in students who are given the treatment of traditional Gobak-sodor games, we can obtain the mode or number that often appears in the questions of indicators 4 and 6, indicating that students are included in the moral stage of authority orientation and maintenance of social rules and universal ethical principles. The fourth stage of moral reasoning by Kohlberg is the importance of obeying laws, decisions and social conventions because it is useful in maintaining function within a group. Moral reasoning in stage four goes beyond the need for individual acceptance as in stage three; the need to socialize with fellow members must outweigh personal needs. In stage four, learners fulfill their right to obey laws and rules. If one breaks the law, then one is morally wrong, so censure becomes a significant factor in this stage because it separates the bad from the good. While stage 6 is the highest moral reasoning of moral reasoning put forward by Kohlberg that children do the right action because it is not for personal intentions. In Gobak-sodor games, students are seriously committed to obeying existing rules so that they are truly committed to being fair to others.

B. Discussion

The game of Gobak-sodor is able to make children's moral behaviour better, because traditional games are full of good, positive, and virtuous human values. According to the results of research that has been carried out on fifth grade students at Sekolah Dasar Islam Terpadu Insan Utama Yogyakarta, the results of the experimental and control assessment post-test scores are obtained. The development of moral judgment in using benthic traditional games in this study there is a significant difference between learning that is given treatment and that is not given treatment. After it is known that there is an improvement in the learning ability of students in both classes on the material presented, next is the analysis of differences in the improvement of student learning outcomes between the experimental class and the control class. According to the statistical results of the normality test, the P-value (sig.) of the experimental class is 0.137, and for the control class the P-value (sig.) is 0.070, which indicates that the experimental and control classes are normally distributed. Because it is normally distributed, the test is carried out using an independent sample t-test to see the difference in improvement.

From the calculation of the hypothesis test using the independent sample t-test, the Asymp.Sig (2-tailed) value is 0.048>0.05, which means Ha is accepted and H0 is rejected. Because of that it can be concluded that there are differences in the development of moral judgment owned by students who apply the traditional game learning model of Gobak-sodor.

This allows children to understand whether their feelings are appropriate, not only in moral dilemmas, but also in response to others. The researcher defined moral emotion as guilt, anxiety, concern, and empathy. The moral value that reflects the moral emotion aspect during play is that children are trained to say sentences politely when accepting defeat, not blaming teammates, apologizing when friends are playing too hard and not cheating so as to cause emotions in the game. The moral conduct aspect, which is the behavioural component in morality, and consists of two parts. The first is involvement in prosocial behaviour or helping behaviour, and

the second is resistance or refraining from engaging in antisocial behaviour such as stealing. Moral values contained in children's moral development, for example, students can complete tasks according to game procedures, obey the rules made in the team, be able to cooperate in the team, and help friends who are in trouble.

Whereas in this study the traditional game of Gobak-sodor is very suitable to be used to build morals in students, it can be seen from the achievement of students on each indicator when filling out the moral dilemma questionnaire. The moral development of students can be seen from the behaviour that reflects the indicators on each moral dilemma question as follows:

1) Compliance and punishment orientation

According to moral reasoning in the game of Gobak-sodor, there is moral reasoning that is included in the "law and obedience" stage because the child character described is experiencing a moral dilemma, namely "the obligation to obey the rules in the traditional game" by doing it in groups makes children think logically to win the game by being honest and not cheating. Children will understand the importance if there is "cheating, lying and dishonesty" if they know the consequences of a team that violates the rules then there is (punishment) that will be received.

2) Personal interest orientation (What's good for me?)

The value of personal interest orientation is based on the second moral reasoning, where children must know the importance of working hard in a job, namely in the form of "strategizing in playing with a group" which children must do because of "fun rewards". This makes children work together because of the desire to get a pleasant reward. Rewards make the main motivation for mutual cooperation and foster the nature of the protagonist (good child).

3) Interpersonal harmony and conformity orientation (children's good attitudes)

The third stage of moral values, which is one level, shows that children are able to show good behavior during games. This confirms the perception of the value of honesty, establishing brotherhood during play and having polite behavior that is important for children, so that children are called good children.

4) Authority orientation and maintenance of social rules (Morality of laws and rules)

Orientation to authority, children in their psychological development are individuals who are very vulnerable to not being honest for the sake of their own pleasure. Here children can do things that harm others for their own pleasure. In the Gobak-sodor game developed by this researcher, children are very concerned about the rules in the Gobak-sodor game so that it can be said that children are starting to be interested in something new they do and the curiosity of each child has a curiosity to try it. If children violate the rules or cheat in a game, they will be sanctioned in the form of punishment, such as deducting points or being excluded from the game.

5) Stage five is community rights and individual rights

Stage five is community rights and individual rights. The fifth moral level is an obligation for each individual to cooperate in making joint decisions to achieve mutual agreement, where children are trained in this traditional game to apply democratic values to personal opinions, to realize the comfort of a rational sense of playing in groups.

6) Universal ethical principles

The sixth stage of moral reasoning orientation is the highest level in the moral stages proposed by Kohlberg where the orientation is on conscience decisions and on self-chosen ethical principles, which refer to logical, comprehensive, and consistent understanding. These principles are abstract and ethical are universal principles of justice, reciprocal justice and a sense of human rights. Where when playing traditional games in groups, children carry out the decisions of the results of the discussion properly and correctly even though it does not match the individual's heart but because it has become a collective decision, it must still carry it out.

Therefore, a discussion of the research findings can be presented. The development of moral judgment in the traditional game of Gobak-sodor at Sekolah Dasar Islam Terpadu Insan Utama Yogyakarta to make children more familiar with the moral values that exist in Gobak-sodor and can be applied in everyday life at school, in society and in the family. Based on the above, the development of moral judgment in the traditional game of Gobak-sodor is able to provide changes from before being given treatment and after being given the treatment of Gobak-sodor games. From the results of the research exposure above, grade V students as control classes using conventional learning models have moral judgment tendencies with pre-conventional level 1 and conventional level 2, at stage 2 personal interest orientation and 4 authority orientation and maintenance of social rules. While students using traditional game learning have an increase in moral development. The experimental class has a tendency to moral judgment with conventional level 2 and post-conventional level 3, at stage 4 orientation of authority and maintenance of social rules and stage 6, namely universal ethical principles.

This research found that the integration of digital technology in traditional game-based learning can enhance student engagement and strengthen their understanding of local wisdom values. These findings are consistent with previous research that shows the use of technology in education can enhance student motivation and learning outcomes. For example, research by [54] shows that game elements in learning can increase student engagement and facilitate deeper learning. Furthermore, research by [55] emphasizes the importance of cultural context in game-based learning. By integrating elements of local wisdom into the game, students not only learn about academic content but also understand and appreciate their own culture. This is in line with the results of this study, which show that students engaged in games containing local values demonstrate an improvement in their cultural understanding. Furthermore, research by [56] emphasizes the importance of cultural context in game-based learning. By integrating elements of local wisdom into the game, students not only learn about academic content but also understand and appreciate their own culture. This is in line with the results of this study, which show that students engaged in games containing local values demonstrate an improvement in their cultural understanding. Furthermore, research by [57, 58] states that the current generation are "digital natives" who are more comfortable with technology. Therefore, combining digital

technology with traditional learning methods can create a more relevant and engaging learning experience for students. These findings support the argument that innovation in education must consider the preferences and needs of today's youth [59–61].

However, although the results of this research show the positive potential of integrating digital technology in game-based learning, there are still challenges that need to be addressed. For example, access to technology and training for educators to use digital tools effectively are important factors that can influence the success of implementation. Further research is needed to explore ways to address these challenges and ensure that all students have equal opportunities to benefit from this innovation. However, although the results of this research show the positive potential of integrating digital technology in game-based learning, there are still challenges that need to be addressed. Overall, this research makes an important contribution to the understanding of how digital technology can be used to enrich traditional game-based learning and develop local wisdom values. By combining these findings with previous research, we can better understand the potential for innovation in education to create more effective and meaningful learning experiences. Overall, this research makes an important contribution to the understanding of how digital technology can be used to enrich traditional game-based learning and develop local wisdom values [45, 62, 63]. By combining these findings with previous research, we can better understand the potential for innovation in education to create more effective and meaningful learning experiences. However, it is important to acknowledge some limitations in this study, including the sample size which may not represent the broader population, which can affect the generalization of the findings. Moreover, reliance on self-reported data can introduce bias, as participants may provide socially desirable responses. Moreover, the focus of the research on specific communities may limit the applicability of the results to other cultural contexts. Future research should address these limitations by incorporating a more diverse sample and using a mixed-methods approach to enhance the validity of the findings.

IV. Conclusion

The research results show that the integration of digital technology in traditional games not only enhances student engagement but also strengthens their understanding of cultural values and local wisdom. By using interactive and immersive elements, students become more motivated to actively participate in the learning process, which has the potential to improve their learning outcomes. Moreover, the use of digital technology in the context of game-based learning has proven effective in supporting students' understanding of cultural values and local wisdom, which is important for the preservation of cultural heritage. This research suggests that educators and curriculum developers consider integrating digital technology into game-based learning to create more relevant and contextualized learning experiences. From the discussion, it can be concluded that the use of digital technology in the context of game-based learning can be an effective tool to support relevant and contextualized education, indicating that this approach can help students not only in academic aspects but also in the development of their cultural identity. Suggestion for scientific development, to expand this study by involving more communities and variations of traditional games. Further research could also explore the long-term impact of this method on the understanding and preservation of local wisdom values among the younger generation. The potential for future research, future studies can focus on the development of more structured and integrated learning modules, as well as evaluating their effectiveness in a broader context. In addition, studies on how digital technology can be adapted to other local cultures and contexts are also needed to enrich the literature in this field.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Setia Wardani found the main topic, designed the game, drew conclusions from the research findings and compiled the manuscript. Selly Rahmawati compiled the questionnaire design and system implementation. Rianto Rianto designed the game, Arita Witanti verified the data the data obtained from the field and Berliana Kusuma Riasti verified analyzed and the data obtained from the field. All authors had approved the final version.

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