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Development of the Interactive Learning in Traditional Games (ILinG) Model in the Game "Sluku-sluku Bathok" as a Tool for Meaningful Learning in the Society 5.0 Era

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Abstract: This study aims to develop and test the feasibility, practicality, and effectiveness of the Interactive Learning in Traditional Games (ILinG) model as a means of promoting meaningful learning in the Society 5.0 era. The study employed a Research and Development (R&D) method using the ADDIE framework, which consists of the analysis, design, development, implementation, and evaluation stages. The research was conducted in an elementary school in the Sidoarjo region. The sampling technique used was purposive sampling. Data were collected through questionnaires, document analysis, and tests, and were analyzed using mixed-methods techniques to obtain comprehensive findings. Based on expert validation results, the developed model demonstrated a very high level of feasibility. The material expert provided an average score of 3.74, categorized as "very feasible," while the design expert assigned a score of 3.63, also categorized as "very feasible." In addition, the linguistic validation obtained a score of 3.77, which likewise falls into the "very feasible" category. In terms of practicality, small-group testing (5 students) resulted in a score of 93.57%, while large-group testing (12 students) yielded 80.95%, indicating that the ILinG model is highly practical for classroom implementation. Regarding effectiveness, t-test analysis revealed a significant difference in mean scores between the control group (71.33) and the experimental group (89.21). The statistical test showed a significance value ($p < 0.05$), indicating that the null hypothesis was rejected and the alternative hypothesis was accepted. These findings confirm that (1) the ILinG model has a significant positive effect on students' meaningful learning, and (2) the model is highly effective as a learning intervention to enhance meaningful learning in the Society 5.0 era.

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Introduction

An effective learning process does not happen by itself, but requires careful and systematic planning. This planning plays an important role in helping teachers determine objectives, models, strategies, methods, and evaluations that are appropriate to students' needs (Haerani et al., 2020, Solone et al., 2020) In addition, a well-structured learning design will make it easier for students to understand the material being studied (Villanueva & Di Stefano, 2017). One of the main goals in education is to create a pleasant and meaningful learning experience (Holmqvist & Lelinge, 2020, Udin By Arifin et al., 2021). Therefore, it needs to be designed with varied models and strategies so that students can develop broader understanding and skills (Y. Cui et al., 2022, Tsai et al., 2020, Abels et al., 2020).

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The development of global civilization has now entered the era of Society 5.0, an era that demands the use of new technologies and a transformation in learning that is not merely oriented towards mastering knowledge but also towards strengthening 21st-century skills such as collaboration, communication, creativity, and critical thinking (Matenda et al., 2020). Therefore, the education system is required to provide adaptive, humanistic, and meaningful learning so that students become not only users of technology but also able to manage it wisely (Van Praag et al., 2017, Parker & Bickmore, 2020).

In line with these demands, the world of education is also faced with the global agenda of the Sustainable Development Goals, particularly the fourth goal, SDG 4 Quality Education, which emphasizes the importance of inclusive, equitable, and quality education. Many learning practices remain teacher-centered, lack contextualization, and fail to accommodate the needs of students' social-emotional development (Wang et al., 2022). The rapid advancement of digital technology has instead presented new challenges in the form of increasing individualistic tendencies among students. Excessive use of digital devices has led to the emergence of the phenomenon of nomophobia, a state of anxiety experienced when individuals cannot access their mobile devices. This phenomenon has an impact on decreasing direct social interaction, weakening interpersonal communication skills, and reducing students' social sensitivity (Quílez-Robres et al., 2021).

Based on the explanation above, the problem that arises in Indonesia is the lack of integration of local wisdom, such as traditional games, into interactive and structured learning systems. Strategies that only focus on completing material risk failing to equip students with essential problem-solving skills. Based on preliminary research results, data show that: 1) 90.86% of schools do not yet have an integrated game-based learning system, 2) 88.43% of teachers have difficulty relating material to local cultural contexts in interactive learning.

One method that can be applied based on the problems above is a learning approach using Deep Learning that integrates meaningful learning. The use of traditional games as interactive learning media in Indonesia takes various forms because it develops from local wisdom in different regions (Yang et al., 2023, C.-Y. Chen, 2022, Kaplan-Rakowski & Gruber, 2023). Therefore, these games not only function as entertainment, but can also serve as learning tools involving cognitive, social, and motor aspects. In addition to providing more enjoyable learning experiences, traditional games such as Sluku-sluku Bathok are also recognized as having educational value. Students can understand material through singing and direct experiences that are relevant to their lives (Lester et al., 2023, Te Ava, 2020).

Traditional games, especially the Sluku-sluku Bathok game, have long been part of community culture and possess high educational value. In addition to containing elements of togetherness, creativity, and motor skill development, traditional games also teach various academic concepts such as mathematics, science, language, as well as social and character values (Matulessy et al., 2022, Cendana & Suryana, 2021, Brata Susena et al., 2021). However, in the era of Society 5.0, where digital technology, artificial intelligence (AI), and the Internet of Things (IoT) are used to improve quality of life, including in education (Gómez-Galán et al., 2024, Yan et al., 2024, Dai et al., 2024), these traditional games are increasingly being abandoned and replaced with technology-based games that tend to be individualistic and lead to excessive dependence on mobile phones, known as nomophobia (Kapuza et al., 2020, Mujiarto et al., 2018, Ali et al., 2021, hwetha & Banu, 2025). This condition results in reduced use of traditional games in school learning processes, even though this method has great potential in creating a more enjoyable and interactive learning atmosphere.

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In the context of traditional games within learning, the Sluku-sluku Bathok game effectively creates joyful learning because it involves physical, social, and emotional aspects that make students active and enjoy learning. (T. Cui & Wang, 2023), (Poquet & de Laat, 2021) This play activity increases motivation, strengthens memory, and facilitates understanding of the material, while also supporting social and character development. Unlike modern educational games that tend to be digital, individualistic, and score-oriented, the Interactive Learning in Traditional Games (ILinG) model offers contextual, collaborative, and local culture-based learning. (Fernández Herrero et al., 2023), (Novak et al., 2022) ILinG makes games a space for social interaction that allows for the internalization of values and direct reflection on experiences. (Pêgo et al., 2024), (Nurdyansyah et al., 2018), (Udin By Arifin et al., 2021). Therefore, ILinG is more effective in creating meaningful learning through holistic engagement—cognitive, affective, and social—that is deeper and more sustainable than modern game-based models. (Kumar et al., 2022),(Zhu et al., 2022)

Based on this, the urgency of the research, as stated by the Minister of Primary and Secondary Education regarding the Deep Learning model in its implementation for the use of technology in the Society 5.0 era, requires the integration of digital technology, artificial intelligence (AI), and the Internet of Things (IoT) to improve quality of life, including in education. Traditional games such as Sluku-sluku Bathok are increasingly rarely used by educators today as highly enjoyable educational games. At the same time, social interaction in learning has declined, replaced by technology-based games that tend to be individualistic. In fact, the development of traditional game-based learning models has great potential to create a more enjoyable, interactive learning environment, as well as encourage collaborative skills and students' social engagement. Therefore, this study aims to produce a prototype model of Interactive Learning in Traditional Games (ILinG) as an implementation of SDGs 4, namely improving the quality of education through appropriate, measurable, and student-centered learning. The ILinG model is expected to create a positive learning environment through the integration of (1) intellectual processes, (2) knowledge assimilation, and (3) strengthening of students' cognitive structures.

Research Method

This type of research is development research using the ADDIE model approach with the aim of developing the ILinG Model. (Amir et al., 2018), (Y.-H. Chen, 2021), There are five stages in the ADDIE Model, namely: 1) Analysis, 2) Design, 3) Development, 4) Implementation, and 5) Evaluation, which form the acronym ADDIE (Susantini et al., 2021). The implementation of the ADDIE model in this study was carried out through five tactical stages, namely: first, the analysis stage, which focuses on an in-depth theoretical and empirical review related to the research variables to evaluate the problem formulation. The data at this stage were sourced from research articles, observation documents, and school documents. Second, the design stage, which involves planning the development of the ILinG Model prototype as the research product. The product design is adjusted to the predetermined problem formulation. Third, the development stage, includes a prototype validation process involving experts in the field. This validation was carried out by one design professor and two media and content education practitioners. Fourth, the implementation stage, which consists of gradual product trials with elementary school students. These trials include: (a) individual trials (stage I) with 5 students, (b) small group trials (stage II) with 12 students, and (c) field trials (stage III) with 22 students. This final test aims to determine the level of students' abilities after using the ILinG Model. Fifth, the evaluation stage, which aims to identify the effectiveness of the ILinG Model in improving students' abilities. Evaluation was

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conducted through a comparative study by comparing data between the control class and the experimental class.

This study uses two types of data sources. Primary data, which are the main data to answer the research problems, were collected through questionnaires and observations. Meanwhile, secondary data were obtained through documentation studies and serve as supporting data sources. The product trial of the ILinG Model was carried out in two stages, namely feasibility testing and effectiveness testing. The feasibility test was conducted through an expert validation mechanism. This feasibility test instrument was measured using a four-level Likert scale, with a score range from 1 (very unfeasible) to 4 (very feasible). (Ricu Sidiq & Najuah, 2020), (Alzanah & Dewi, 2022), (Sari et al., 2021) The following is the score criteria table:

Table 1. Validity Assessment

Qualifications	Unit Value
Very Appropriate/Suitable	4
Appropriate/Suitable	3
Not Appropriate/Suitable	2
Very Inappropriate/Unsuitable	1

The obtained score can be calculated using the formula:

$$\text{Precentage} = \frac{\sum(\text{score} \times \text{component weight})}{n \times \text{maximum score}} \times 100\%$$

After calculating the score value, the product is then categorized for its feasibility if it meets the following qualifications:

Table 2. Feasibility categories for expert validation

Feasibility Level	Qualifications	Clarification
81-100	Very Appropriate	No revision needed
61-80	Appropriate	Minor revision
41-60	Quite Appropriate	moderate revision
21-40	Not Appropriate	Major revision
0-20	Very Inappropriate	Modified

If the product has a value > 61 and has a qualification of Appropriate or very Appropriate according to expert validation results, then the product is declared feasible.

Results and Discussion

Feasibility of the ILinG Model

The effectiveness of various learning models currently implemented is often limited by a lack of relevance between teaching materials and students' real-world contexts, as well as weak mastery of basic literacy that underpins the inquiry process. (Arnaiz-Sánchez et al., 2020), (Kenny et al., 2020), models also tend to address these issues only partially. To overcome these challenges, this study introduces the ILinG Model as a structural innovation. (Kristanto et al., 2025) Based on expert validation results, the ILinG Model is categorized as highly feasible, with assessments covering the suitability of the learning syntax, the integration of traditional games, the clarity of the learning flow, and its alignment with the curriculum. The validation results are as follows:

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Table 3. Validation Results of the Feasibility of the ILinG Model

Assessment Aspect	Stage I Score	Stage I Category	Stage II Score	Stage II Category
Syntax Suitability	3,2	Very Appropriate	3,8	Very Appropriate
Material Integration	2,75	Appropriate	3,75	Very Appropriate
Game Integration	3,2	Very Appropriate	3,85	Very Appropriate
Easy Use of ILinG Model	2,75	Appropriate	3,5	Very Appropriate
Average	**2,98**	**Appropriate**	**3,73**	**Very Appropriate**

The significant improvements between Phase I and Phase II in the implementation of the ILinG model demonstrate more than just technical improvements, but rather a fundamental strengthening of the quality of learning. Increased scores on aspects of syntax appropriateness, material integration, and game integration indicate that the learning design in Phase II is increasingly aligned with how students construct knowledge. From David Ausubel's perspective, this reflects the success of meaningful learning, where new material is strongly connected to students' existing cognitive structures. (Awada & Plana, 2018) The integration of traditional games plays a crucial role in contextualizing concepts, making learning more relevant, less abstract, and easier to understand.

Furthermore, the most notable improvement in the ease of use aspect indicates that the ILinG model has been operationally refined to make it more practical to implement. This aligns with Jerome Bruner and Lev Vygotsky's view that effective learning occurs through structured experiences and appropriate social support. (Maher & Morley, 2020) The increase in the average score from 2.98 to 3.73 confirms a leap in quality, not only quantitatively but also qualitatively, as a result of a systematic evaluation and revision process. Thus, the ILinG model in Phase II is not only more conceptually mature, but also more applicable, because it is able to integrate the principles of meaningful learning, constructivism, and cultural context in a complete manner.

Feasibility Study for Product Development

This research describes the development of the ILinG Model by adopting the ADDIE model procedure. At the development stage, a validation and verification process was conducted to test the feasibility of the ILinG Model product. (VanderKaay et al., 2021), The feasibility assessment involved three expert validators (content, design, and language). The feasibility evaluation results provided by the media experts are presented as follows:

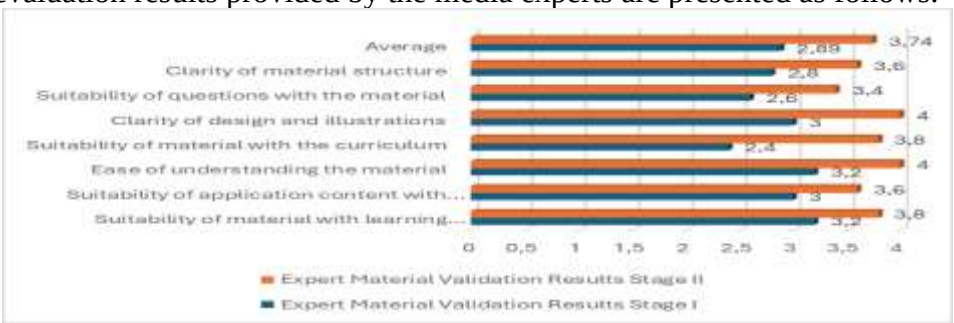

Figure 2. Results of Content Expert Validation Phase I & II

The increase in scores across all indicators between Phase 1 and Phase 2 demonstrates substantial improvement, particularly in addressing the misalignment between objectives, materials, and learning activities previously identified by low curriculum alignment and question quality. Following the revision, higher, even maximum, scores for comprehension and design clarity demonstrate that the material has been reconstructed to be more structured,

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contextual, and understandable. (Gandamana & Marisa, 2022) This reflects the success of meaningful learning, where new material connects with students' cognitive structures. The increase in the average score from 2.89 to 3.74 also confirms the strengthening of a more systematic and curriculum-aligned instructional design. Effective learning occurs through clear structures, active learning experiences, and social support, making the ILinG Model more mature, applicable, and feasible for widespread implementation.

Feasibility Test Results by Design Experts

Table 4. Results of the Design Expert Assessment (Stage I and II)

No	Standard	Stage I Score	Percentage (%)	Category	Stage II Score	Percentage (%)	Category
1	Suitability of ILinG Model display	3,2	80	Suitable, requires minor repairs	3,8	95	Very Suitable, no repairs needed
2	Image/visual quality	2,4	60	Fairly Suitable, requires moderate repairs	3,6	90	Very Suitable, no repairs needed
3	Ease of features and navigation	3,4	85	Very Suitable, no repairs needed	4,0	100	Very Suitable, no repairs needed
4	Suitability of media with material	3	75	Suitable, requires minor repairs	3,8	95	Very Suitable, no repairs needed
5	Colour clarity	3	75	Suitable, requires minor repairs	3,6	90	Very Suitable, no repairs needed
6	Ease of use of ILinG Model	2,4	60	Fairly Suitable, requires moderate repairs	3,2	80	Suitable, requires minor repairs
7	Attractiveness of ILinG Model	3,2	80	Suitable, requires minor repairs	4,0	100	Very Suitable, no repairs needed
8	Suitability of illustrations	1,8	45	Not Suitable, requires minor repairs	3,0	75	Suitable, requires minor repairs
	Average	**2,80**	**70,00**		**3,63**	**90,63**	

The improvement in the ILinG Model's visual quality from Phase I to Phase II demonstrates strategic improvements oriented toward user experience, not just surface aesthetics. In Phase I, low scores on visual quality and illustration suitability indicated a mismatch between the visual representation and the material, thus hindering students' information processing. After revision, significant improvements, reaching the very good category, even maximum ratings for navigation and appeal indicate that the visual design has been optimized to support clarity, consistency, and ease of access to information. From the perspective of cognitive load theory and multimedia learning, as reviewed by Barzilai and Stadtler, visual presentation aligned with content can reduce cognitive load and enhance comprehension. (Saloviita & Pakarinen, 2021), (Barzilai & Stadtler, 2025). Furthermore, improvements in ease of use and navigation reflect the application of user-centered design

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principles, making user interactions more intuitive and efficient, in line with the findings of Saloviita and Pakarinen. Thus, the jump in the average score from 2.80 to 3.63 not only demonstrates quantitative improvement but also confirms the successful integration of visual quality, functionality, and pedagogy, making the ILinG Model more effective, engaging, and ready for widespread implementation without substantial revision.

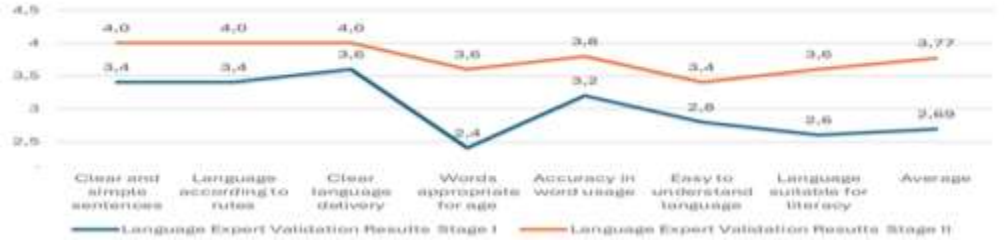

Figure 3. Results of Language Expert Validation Phase I and II

The consistent increase in linguistic validation scores from Stage 1 to Stage 2 reflects a substantive improvement in the function of language as an effective medium of instruction rather than merely a surface-level revision. The moderate scores in Stage 1 on aspects such as age-appropriate diction, readability, and literacy alignment indicate an initial mismatch between language complexity and learner characteristics, which likely reduced clarity and accessibility. Following revision, the significant improvements, including maximum scores in sentence clarity, grammatical accuracy, and clarity of delivery demonstrate that the language has been systematically refined to be more precise, coherent, and easier to understand. The sharp rise in the average score from 2.69 to 3.77 confirms a shift from adequate to highly suitable quality, driven by improved word choice, better alignment with learners' literacy levels, and clearer message delivery. Overall, these changes indicate that the language has become more communicative, efficient, and supportive of the learning process, making the product suitable for implementation without substantial revision.

The Effectiveness of the ILinG Model as a Means of Meaningful Learning

1) Stage I Small Group Test

In order to fulfil the practicality test of the ILinG Model according to the ADDIE Model approach, a small group test will be conducted involving 5 students with high, medium, and low academic abilities in the fourth grade of elementary school in Sidoarjo. The results of the small group test assessment can be seen in the following table.

Table 5. Results of the Small Group Test of the ILinG Model

No	Aspect	s1	s2	s3	s4	s5	Average	Criteria
1)	The ILinG Model promotes the realization of meaningful learning	4	4	4	4	4	4,00	Very Suitable
2)	The ILinG Model is based on interactive traditional learning	3	3	4	4	3	3,40	Very Suitable
3)	The materials in the ILinG Model are enjoyable and meaningful	4	3	4	4	3	3,60	Very Suitable
4)	The ILinG Model helps students understand the learning material	3	4	4	4	4	3,80	Very Suitable
5)	The ILinG Model is equipped with user-friendly features	4	3	3	4	3	3,40	Very Suitable
6)	The materials in the ILinG Model comply with the	4	4	4	4	4	4,00	Very Suitable

	applicable curriculum							
7)	The ILinG Model's appearance is attractive and suits the learning needs	4	4	4	4	4	4,00	Very Suitable
	Total Value	**3,71**	**3,57**	**3,86**	**4,00**	**3,57**	**3,74**	**Very Suitable**
	Percentage						**93,57 %**	

The high scores obtained in the Small Group Test, with an overall average of 3.74 and several aspects reaching the maximum score (4.00), indicate that the ILinG Model has undergone effective refinement in both conceptual design and practical implementation. The strong performance in aspects such as meaningful learning facilitation, curriculum relevance, and visual appeal suggests that the revisions successfully aligned the model with user expectations and learning needs, making it more intuitive, engaging, and contextually appropriate. Improvements in clarity of material and the overall learning experience further demonstrate that the model is now easier to understand and more enjoyable to use, which directly contributes to higher user acceptance. Although slightly lower scores on interactivity and ease of feature use (3.40) reveal remaining technical and usability constraints, these do not significantly affect the overall perception of quality. The relatively consistent scores among respondents (ranging from 3.57 to 4.00) reinforce the reliability of these findings, indicating that the improvements have been perceived uniformly. Overall, the increase in scores reflects a successful optimization of content relevance, usability, and user experience, positioning the ILinG Model as a highly feasible and practical learning medium with a strong acceptance rate of 93.57%.

2) Stage II Further Testing for 12 Students

In order to measure the effectiveness of the ILinG Model in Stage II, an evaluation was conducted on 12 students. The assessment used a preference scale (like–dislike) based on five indicators established by the researcher. The results of the Stage II evaluation are presented as follows.

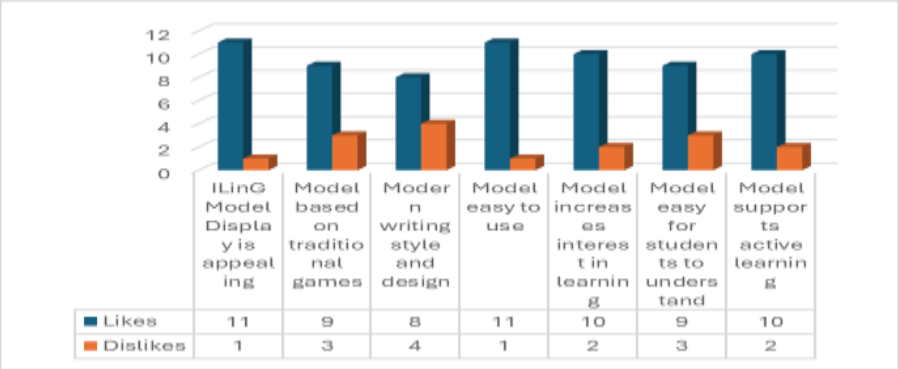

Figure 4. Results of Phase II Evaluation

The predominance of positive student responses toward the ILinG Model reflects a substantive improvement in its usability, visual appeal, and alignment with learner expectations, which collectively explain the increase in evaluation scores. The high level of preference for the model's appearance and ease of use indicates that revisions have successfully optimized both interface design and operational simplicity, making the model more intuitive and accessible during implementation. (Hilliger et al., 2023), (Martin et al., 2021) This improvement likely reduced barriers to engagement, allowing students to focus more on the learning process itself, which is further evidenced by strong responses in

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increased learning interest and support for active participation. Although some variability remains in aspects such as writing style, modern design, and the use of traditional game bases suggesting differences in individual preferences and levels of comprehension. These do not significantly diminish overall acceptance. Instead, they highlight specific areas for fine-tuning rather than fundamental weaknesses. The consistency of dominant "like" responses across all indicators, supported by a high cumulative agreement score of 80.95%, confirms that the model revisions effectively enhanced user experience and relevance, thereby driving the overall increase in scores and positioning the ILinG Model as a practical and well-accepted tool in the learning process.

The results of the second stage evaluation above are consistent with the comparison of the pre-test and post-test as shown in figure 1.5 below:

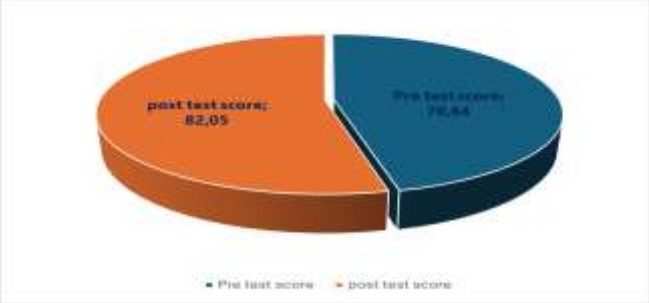

Figure 5. Results of Pre-test and Post-test

The analysis of the pre-test and post-test results shows a significant improvement in student learning outcomes after the implementation of the ILinG Model. The average score increased from 70.64 in the pre-test to 82.05 in the post-test, with a difference of 11.41 points. This increase indicates an overall enhancement in the students' cognitive abilities collectively. Individually, almost all students experienced an increase in their scores, with some showing a substantial jump, such as a student improving from 60 to 90. Additionally, there were two students who achieved the maximum score of 100 in the post-test, indicating that the learning model was able to encourage optimal achievement for students. This identifies a meaningful improvement in student learning outcomes after using the ILinG Model.

3) Results of Control Class and Research Class Tests

Tests on the control class and the experimental class were conducted to identify differences in students' digital literacy abilities between the group using the ILinG Model and the group not using it. The data analysis results are presented in the following table: Table 1.7 Paired Samples Statistics:

Table 6. Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Kls-Crl	71.33	22	5.771	1.802
Kls-Rst	89.21	22	4.897	1.163

Table 7. Paired Samples Correlations

	N	Correlation	Sig.
Pair1 Kls-Crl Kls-Rst	22	.806	.000

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Table 8. Paired Samples Test

	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig.(2-tailed)
Pair 1 Kls-Crl Kls-Rst	-29.146	4.882	1.224	6.925	2.179	-15.938	22	.000

The substantial difference between the control class (71.33) and the experimental class (89.21), supported by a p-value of 0.00 (<0.05) and a strong correlation coefficient of 0.806, indicates that the increase in scores is driven by a systematic improvement in the learning design rather than incidental factors. (Alzanah & Dewi, 2022), (Wulandari et al., 2022) The ILinG Model appears to restructure the learning process in a way that better aligns instructional strategies, learning activities, and student engagement, resulting in more effective knowledge acquisition. The higher achievement in the experimental class, which surpasses the KKM of 76, suggests that the model not only enhances performance statistically but also meets practical educational standards. This improvement can be attributed to the model's ability to present learning in a more structured, engaging, and accessible manner, enabling students to process information more efficiently and retain it more effectively.

Moreover, the integration of traditional games such as *Sluku-sluku Bathok* contributes significantly to this increase by transforming learning from a passive activity into an interactive and context-rich experience. These games function as a bridge between abstract material and students' real-life experiences, making concepts easier to grasp and more meaningful. The interactive nature of the activities also promotes collaboration, participation, and sustained attention, which are critical factors in improving learning outcomes. However, the success of this approach is not solely dependent on the media used, but also on how well it is supported by instructional methods, material quality, teacher facilitation, and a conducive learning environment. (Maulidia et al., 2025), (Setyawan et al., 2025) When these elements are integrated cohesively and systematically, they create a synergistic effect that amplifies learning effectiveness, thereby explaining the significant increase in student performance.

Conclusion

This research successfully demonstrates that integrating local wisdom into modern instructional design is not merely an effort to preserve culture, but rather an effective pedagogical strategy to address the challenges of individualism in the Society 5.0 era. The findings demonstrate continuous quality improvement through iteration, confirming that the traditional game-based learning model is academically acceptable and has strong structural validity for implementation in the formal curriculum.

The practicality of the ILinG Model, as evidenced by its strong validity from Phase I to Phase II, reflects the need for continuous reflection and revision in adaptive instructional design. This emphasizes that the local wisdom-based ILinG model is highly practical to use because it delivers clear syntax and ease of navigation for users. The successful visual and linguistic transformation of the ILinG model demonstrates that the greatest challenge in implementing traditional values is how to package them to be relevant to the aesthetics and literacy needs of today's digital generation. The effectiveness of this model provides an important signal to the world of education that technological advances do not necessarily eliminate tradition. Instead, local wisdom can serve as an anchor that strengthens students' character and literacy skills amidst the massive flow of digitalization. In conclusion, the ILinG model offers a new paradigm in basic education: a synthesis between the noble values

of the past and the competency needs of the future that can produce more comprehensive and in-depth learning outcomes.

Recommendation

For Educational Practitioners: Teachers need to make traditional games a core learning medium, not just a distraction, to make abstract concepts like math and science more contextual and meaningful. Digital and cultural competencies also need to be enhanced by integrating local wisdom and technology without reducing students' social interaction. Furthermore, teachers are advised to creatively modify games like Sluku-sluku Bathok to accommodate various learning styles (visual, auditory, and kinesthetic).

For Learning Model Developers: The development of the ILinG model needs to orient toward humanistic digitalization through digital or hybrid versions that emphasize physical and social interaction to reduce device dependency (nomophobia). Ease of feature and navigation aspects should also be optimized to be more user-friendly for elementary school students. Furthermore, diversification is needed by adapting other traditional games like Congklak and Wayang into a structured learning syntax.

For Future Researchers: Longitudinal studies are recommended to test the sustainability of learning outcomes (average score of 89.21) and their impact on students' social character. Geographical expansion of the subject scale is also necessary to strengthen generalizability. An in-depth qualitative approach is important to understand the psychological mechanisms of knowledge assimilation through traditional games.

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