

Development of the KAI Model (Collaborative, Adaptive, Individual) to Improve Elementary School Students' Literacy

Caecillia Supraptini, Chandra Anugrah Putra, Hendri

Universitas Muhammadiyah Palangka Raya Jl. RTA Milono Km 1,5 Palangka Raya. Indonesia.

*Correspondence e-mail: caecilliasupraptini59@admin.sd.belajar.id

Received: Mey 2026; Revised: Mey 2026; Published: June 2026

Abstract

This study developed the KAI Model, an instructional innovation integrating collaborative, adaptive, and individual learning to improve literacy instruction at SD Negeri Balai Riam. The study was motivated by classroom conditions in which literacy learning remained largely teacher-centered, learning strategies were limited, and students showed varied reading abilities. Using a Research and Development design with the 4D model consisting of define, design, develop, and disseminate stages, this study produced a literacy learning model, teaching module, student worksheets, and assessment instruments for Grade IV Indonesian language learning. Data were collected through observation, interviews, expert validation, teacher and student responses, and pretest-posttest assessment. The results show that the KAI Model was highly feasible, with expert validation scores of 90% for media feasibility, 100% for material feasibility, 83.3% for language feasibility, and an overall average of 91.1%. Classroom implementation indicated that the model could be applied systematically through orientation, collaborative text discussion, adaptive task differentiation, individual literacy work, and reflection. The model also received positive responses from teachers and students because it encouraged active participation, peer discussion, motivation, and independent learning. Its effectiveness was demonstrated by an increase in students' average literacy score from 55.7 in the pretest to 77.2 in the posttest, with a moderate N-Gain of approximately 0.49. These findings indicate that the KAI Model is valid, practical, and effective as a contextual literacy learning model for elementary schools.

Keywords: KAI Model; literacy learning; collaborative learning; adaptive instruction; individual learning

How to Cite: Supraptini, C., Putra, C. A., & Hendri, H. (2026). Development of the KAI Model (Collaborative, Adaptive, Individual) to Improve Elementary School Students' Literacy. *Reflection Journal*, 6(1), 454-469. <https://doi.org/10.36312/sc3bwe47>



<https://doi.org/10.36312/sc3bwe47>

Copyright© 2026, Supraptini et al

This is an open-access article under the CC-BY-SA License.



INTRODUCTION

Elementary education is a crucial foundation for developing students' literacy because, at this level, learners begin to build the ability to understand texts, process information, express ideas, and use language as a tool for thinking and communication. Literacy is no longer understood merely as the basic ability to read and write. It is now viewed as a multidimensional competence that includes understanding, analyzing, evaluating, thinking critically, and applying information in everyday life. In the Indonesian education context, literacy strengthening has become increasingly relevant in line with the Merdeka Curriculum, which positions students as active subjects in learning. Recent literature also emphasizes that basic literacy should be expanded into multiliteracy, including language literacy, numeracy, scientific literacy, digital literacy, financial literacy, cultural literacy, civic literacy, and information literacy as essential cross-disciplinary skills for lifelong learning (Fitria, 2023; Wahyuni, 2023; Nadifa & Zulvani, 2024).

The urgency of literacy development is also supported by studies showing a persistent gap between literacy policy and classroom practice. School literacy programs, the implementation of the Merdeka Curriculum, and the strengthening of twenty-first-century skills have not always been accompanied by adequate pedagogical readiness,

learning resources, and teacher capacity to implement contextual and student-centered literacy instruction. These challenges are more visible in rural elementary schools, including SD Negeri Balai Riam, where students' literacy levels vary significantly, instructional models remain limited, and local cultural contexts have not been fully utilized as learning resources. Previous studies indicate that home environment, literacy facilities, reading motivation, parental involvement, and teacher capacity strongly influence elementary students' literacy achievement (Nurcahyoko et al., 2024; Yustisia & Salsabila, 2023; Rahmi et al., 2024; Ulpiah et al., 2022).

The main problem in literacy instruction at SD Negeri Balai Riam is the low ability of some students to understand reading texts, recognize new vocabulary, identify main ideas, draw conclusions, and express ideas coherently in writing. Based on the initial observation reported in the original manuscript, literacy instruction at the school remained largely teacher-centered, learning models were not sufficiently varied, opportunities for student collaboration were limited, and instructional approaches had not fully accommodated students' individual learning needs and learning styles. This condition indicates that literacy problems are not only related to students' abilities, but also to instructional design, teaching strategies, learning tools, and classroom environments that support active meaning-making.

A general solution to this problem is the development of a literacy learning model that is innovative, flexible, and responsive to students' characteristics. Such a model needs to combine social learning activities, differentiated instructional strategies, and individual learning support to respond to diverse literacy abilities in one classroom. Literature on student-centered learning emphasizes that excessive reliance on teacher-centered practice may limit student independence, engagement, and critical thinking, particularly when instruction focuses only on content delivery without giving students opportunities to explore, discuss, and reflect (Halik et al., 2023; Rahayu et al., 2024). Therefore, literacy learning should be designed as a meaningful, interactive, and contextual experience in which students not only read texts but also interpret, discuss, rewrite, and connect information with their lived experiences.

More specifically, this study proposes the KAI Model, a learning model that integrates Collaborative, Adaptive, and Individual approaches. The collaborative component emphasizes cooperation among students through group discussion, idea exchange, mutual assistance, and joint literacy tasks. This approach is consistent with collaborative learning theory, which views social interaction as a means of constructing understanding. Johnson and Johnson (2009) argue that cooperation in learning can strengthen engagement, shared responsibility, and academic achievement. In literacy learning, collaboration enables students to discuss reading content, identify main ideas, express opinions, and develop understanding through communication with peers.

The adaptive component of the KAI Model provides teachers with space to adjust strategies, media, text difficulty, and learning support according to students' needs. Tomlinson (2014) explains that instruction responsive to students' readiness, interests, and learning profiles can create a more equitable and effective learning process. In literacy instruction, adaptation may involve providing texts with different levels of difficulty, guiding students who still struggle with reading, using visual or audiovisual media, and assigning tasks according to students' abilities. Meanwhile, the individual component emphasizes independent learning, personal reflection, and direct feedback so that each student can progress according to his or her learning pace. This idea is consistent with Reigeluth's (2013) view of learner-centered instruction.

In addition to integrating the three pedagogical approaches, the KAI Model also has a contextual dimension because it is inspired by the local meaning of the term "KAI" in Kalimantan culture, which refers to a grandfather or respected elder figure associated

with wisdom, guidance, exemplary character, and affection. This philosophical meaning is important because literacy learning should not only improve cognitive achievement but also develop emotional closeness, respect, and character. Studies on local wisdom-based learning show that cultural texts, folktales, and contextual content can increase students' motivation, comprehension, and connection with learning materials (Mufidah et al., 2023; Safitri, 2024). Thus, literacy learning rooted in local contexts can help students understand texts more meaningfully while strengthening cultural identity.

Previous studies have demonstrated the effectiveness of collaborative learning, adaptive instruction, individualized learning, project-based learning, school literacy programs, and contextual reading materials in improving elementary students' literacy outcomes (Prihartini et al., 2023; Istiq'faroh et al., 2022; Sumarno et al., 2024; Suhardiman et al., 2024). However, many of these studies still discuss the approaches separately or have not explicitly integrated collaboration, adaptation, individual support, and local wisdom into one systematic instructional syntax. This gap is important because elementary literacy instruction requires an integrative model that is theoretically valid, practically applicable, and empirically effective in improving literacy in rural school contexts.

Based on this gap, this study aims to develop, validate, and test the effectiveness of the KAI Model as an innovation in literacy learning at SD Negeri Balai Riam. The novelty of the study lies in the integration of three main approaches collaborative, adaptive, and individual into a literacy learning model developed through the Research and Development procedure using the 4D model: Define, Design, Develop, and Disseminate, proposed by Thiagarajan, Semmel, and Semmel (1974). The scope of the study focuses on reading and writing literacy among fourth-grade students, particularly the ability to understand texts, identify main ideas, draw conclusions, and express ideas in writing. Through this development, the KAI Model is expected to become a valid, practical, effective, contextual, and Merdeka Curriculum-aligned alternative for strengthening elementary students' literacy.

METHOD

This study employed a Research and Development design because its main objective was to produce, validate, and test the feasibility of the KAI Model as an innovation in elementary literacy learning. The product developed in this study was not limited to a conceptual learning model, but also included supporting instructional tools, such as teaching modules, student worksheets, learning syntax, literacy assessment instruments, observation sheets, and teacher and student response questionnaires. The use of Research and Development was based on Borg and Gall's (2003) view that development research is a systematic process for developing and validating educational products through needs analysis, design, trial, revision, and empirical validation. Sugiyono (2019) also explains that Research and Development is used to produce a particular product and test its effectiveness in real use.

The development model used in this study was the 4D model proposed by Thiagarajan, Semmel, and Semmel (1974), consisting of Define, Design, Develop, and Disseminate. This model was selected because it provides a systematic and structured procedure suitable for developing instructional models and learning tools that need to be tested in terms of validity, practicality, and effectiveness. Previous studies in elementary education have also shown that the 4D model is widely used to develop learning media, modules, and instructional tools because it allows researchers to conduct needs analysis, product design, expert validation, limited trials, revision, and dissemination in stages (Triwahyuningtyas et al., 2020; Pereira et al., 2020; MZ et al., 2022; Astarina et al., 2024).

The study used a mixed methods approach by combining qualitative and quantitative data. Qualitative data were used to understand learning needs, student characteristics, literacy conditions, teacher practices, and the potential integration of local wisdom in the KAI Model. These data were collected through observation, interviews, documentation, and field notes. Quantitative data were used to measure model validity through expert scores, practicality through implementation percentages and user responses, and effectiveness through pretest and posttest comparisons. Creswell (2014) explains that mixed methods research allows researchers to obtain a more comprehensive understanding by combining descriptive qualitative analysis and numerical evidence.

The study was conducted at SD Negeri Balai Riam, Kecamatan Balai Riam, Kabupaten Sukamara, Central Kalimantan. The school was selected because initial findings indicated that it faced literacy learning challenges, including diverse reading abilities, teacher-centered instruction, limited learning model variation, and insufficient integration of local wisdom into literacy instruction. The research subjects consisted of fourth-grade students, the classroom teacher, the principal, and expert validators. Fourth-grade students were selected because they were at an important stage of literacy development, moving from basic reading toward reading for comprehension, interpretation, and learning. The teacher served as the implementer of the KAI Model and as a key source of information regarding instructional needs and practicality. Expert validators consisted of a literacy material expert, a learning model expert, and a language expert.

The development procedure followed the four stages of the 4D model. The Define stage was conducted to identify the needs of literacy learning at SD Negeri Balai Riam. This stage included front-end analysis, learner analysis, task analysis, concept analysis, and formulation of learning objectives. The front-end analysis identified core literacy problems, such as low student participation, limited teaching strategies, and the absence of a model that accommodates differences in students' literacy abilities. Learner analysis examined students' learning styles, reading interests, socio-cultural background, and reading and writing ability. Task analysis focused on literacy competencies that students needed to master, such as identifying main ideas, recognizing important information, summarizing texts, and writing simple paragraphs.

The Design stage produced the initial design of the KAI Model and its supporting learning tools. The learning syntax consisted of contextual literacy orientation, group collaboration, adaptive learning strategies, individual tasks, and reflection with local value reinforcement. Each stage of the syntax was designed by considering the teacher's role, student activities, forms of interaction, learning support, and literacy assessment indicators. The learning tools included a literacy-based teaching module, collaborative and individual student worksheets, literacy test instruments, observation sheets, and teacher and student response questionnaires.

The Develop stage aimed to produce a valid and feasible product. The KAI Model and its learning tools were validated by experts in literacy materials, learning models, and language. The validation assessed content relevance, syntax suitability, language clarity, media feasibility, and usefulness for elementary literacy learning. Suggestions from validators were used to revise the product before the limited trial. The Disseminate stage was conducted after validation, revision, and limited trial. At this stage, the KAI Model was introduced to teachers at SD Negeri Balai Riam through socialization, discussion, and presentation of trial results.

Data were collected through observation, interviews, questionnaires, tests, and documentation. Observation was used to examine literacy learning before and during the implementation of the KAI Model. Interviews were conducted with the teacher and

principal to obtain information on learning needs, literacy challenges, student characteristics, and responses to the model. Questionnaires were used to collect teacher and student responses regarding practicality, ease of use, clarity of syntax, suitability with the Merdeka Curriculum, learning comfort, and motivation. Tests were used to measure model effectiveness through literacy pretest and posttest. Documentation included teaching modules, student work, attendance lists, learning activity photos, and literacy score records.

Data analysis was conducted qualitatively and quantitatively. Qualitative data from observation, interviews, documentation, and validator comments were analyzed through data reduction, data display, and conclusion drawing. Quantitative data were analyzed using percentages, mean scores, validity categories, practicality categories, and learning gain calculations. The model was considered very valid if it obtained a score of 85–100%, valid at 70–84%, fairly valid at 50–69%, and invalid below 50%. Practicality was analyzed based on implementation percentage and teacher and student responses. Effectiveness was analyzed through pretest-posttest comparison and N-Gain calculation. Following Hake (1998), N-Gain was categorized as high when it reached 0.7 or above, moderate when it ranged from 0.3 to 0.7, and low when it was below 0.3.

RESULTS AND DISCUSSION

Needs Analysis of Literacy Learning

The results showed that the development of the KAI Model was based on the actual needs of literacy learning at SD Negeri Balai Riam. The initial analysis found that literacy instruction remained teacher-centered, students' reading and writing activities were not optimal, teaching strategies were limited, and students' reading abilities varied considerably. Initial data showed that approximately 60% of students were able to read fluently, while 40% still experienced difficulties in reading and understanding texts. This condition indicated the need for a learning model that could combine cooperation, adaptive learning strategies, and individual support.

Table 1 Results of Literacy Learning Needs Analysis

Analyzed Aspect	Main Finding	Implication for Model Development
Learning pattern	Learning was still teacher-centered	A more active and student-centered approach was needed
Literacy activity	Students were less active in reading, writing, and discussion	Collaborative text-based activities were needed
Reading ability	60% of students read fluently, while 40% still struggled	Adaptive strategies based on students' ability levels were needed
Teaching strategy	Literacy learning methods were still limited	A systematic and applicable learning model was needed
Student needs	Students were interested in group discussion, educational videos, and varied activities	A combination of media, discussion, and individual tasks was needed

These findings are consistent with literacy studies emphasizing that literacy learning becomes more effective when collaborative-dialogic learning, adaptive instruction based on student progress, and explicit individualized support are combined. Goldman et al. (2016), Outlaw and Grifenhagen (2024), and Greenleaf et al. (2011) explain that text-based discussion can strengthen reading comprehension, vocabulary development, and reasoning. Deane et al. (2015), Kosh et al. (2017), Zuo and Ives (2023), and Sabatini et al. (2023) also emphasize the importance of assessment and student progress data in adjusting tasks, support, and feedback in literacy instruction.

Design of the KAI Model

The design stage produced the KAI Model with five learning stages: orientation and motivation, collaborative activity, adaptive activity, individual activity, and reflection and evaluation. In the orientation stage, the teacher explained learning objectives and built student motivation. In the collaborative stage, students worked in small groups to read stories, discuss content, identify characters, determine main ideas, and write discussion results. In the adaptive stage, the teacher assigned different tasks according to students' abilities. Higher-achieving students analyzed the moral message of the story, middle-level students identified the main idea of each paragraph, and students with basic reading ability answered simple questions about the text. In the individual stage, each student wrote a conclusion using his or her own words and received feedback from the teacher.

Table 2 Syntax of the KAI Model and Literacy Objectives

Stage of the KAI Model	Main Activity	Literacy Objective
Orientation and motivation	Teacher explains objectives and connects material with students' experiences	Building readiness and reading interest
Collaborative	Students read and discuss texts in groups	Developing reading comprehension and discussion skills
Adaptive	Teacher provides different tasks according to students' ability levels	Adjusting support to learning needs
Individual	Students write story conclusions independently	Measuring personal understanding and literacy independence
Reflection and evaluation	Teacher and students summarize learning	Strengthening understanding and feedback

The developed product was a Bahasa Indonesia teaching module for Grade IV, Phase B, second semester, with the topic "Reading and Concluding Story Texts." The main material focused on identifying main ideas and drawing conclusions from stories. The text used was "Adventure in the Mangrove Forest," linking literacy learning with environmental contexts close to students' experiences. This design supports Carlisle et al. (2013), Sparapani et al. (2018), and Park (2021), who emphasize that literacy learning should combine vocabulary development, post-reading discussion, meaningful texts, and independent activities to strengthen comprehension.

Expert Validation Results

Expert validation was conducted to assess the feasibility of the KAI Model in terms of media, material, and language. The validation results showed that the KAI Model was categorized as highly feasible. Media feasibility obtained a score of 90%, material feasibility obtained 100%, and language feasibility obtained 83.3%. The overall average validation score was 91.1%, indicating that the model was highly feasible for use in elementary literacy learning.

Table 3.3. Expert Validation Results of the KAI Model

Validation Aspect	Percentage	Category	Interpretation
Media feasibility	90%	Highly feasible	Media and tools were clear and supported learning
Material feasibility	100%	Highly feasible	Material matched students' literacy needs and learning outcomes

Language feasibility	83.3%	Highly feasible	Language was communicative and appropriate for elementary students
Average	91.1%	Highly feasible	Model was feasible for trial and implementation

These validation results indicate that the KAI Model has adequate conceptual and operational feasibility. Conceptually, it integrates collaborative, adaptive, and individual learning into one systematic syntax. Operationally, the learning tools were considered usable by teachers. This is consistent with Deane et al. (2015), who emphasizes that literacy tool development should connect learning theory, task design, and assessment. Drew and Thomas (2021) also argue that the feasibility of literacy instruction should be assessed based on pedagogical quality, student grouping, learning engagement, and instructional suitability to classroom needs.

Implementation and Practicality

The implementation results showed that the KAI Model syntax could be applied in Grade IV Bahasa Indonesia learning. The teacher implemented activities ranging from explaining learning objectives, presenting learning steps, forming groups, facilitating discussion, assigning adaptive tasks, guiding students who experienced difficulties, assigning individual tasks, and conducting reflection. Student activities also showed positive development. Students actively read texts, cooperated in groups, discussed reading content, expressed opinions, adjusted to adaptive tasks, and completed individual tasks. However, some students still required guidance in drawing accurate conclusions from the text.

Table 4. Observation Results of KAI Model Implementation

Implementation Component	Observation Result	Interpretation
Teacher activity	Teacher implemented KAI syntax sequentially	The model was applicable in classroom learning
Collaborative student activity	Students actively read and discussed in groups	Collaboration helped build text comprehension
Adaptive activity	Teacher provided tasks according to ability levels	Learning became more responsive to student differences
Individual activity	Students wrote conclusions independently	Literacy independence began to develop
Challenge	Some students were not yet accurate in drawing conclusions	More practice and feedback were needed

Teacher responses showed that the KAI Model was considered effective, relevant, and helpful in increasing student learning activity. The teacher stated that the adaptive approach helped students with low reading ability because instruction could be adjusted to their needs. Student responses were also positive. They enjoyed group discussion, reading stories with friends, watching learning videos, and completing tasks that were easier to understand. Steinke and Wildsmith-Cromarty (2019) and Drew and Thomas (2021) emphasize that the practicality of a literacy model should be measured through classroom implementation, teacher responses, student responses, and the model's suitability to actual learning conditions.

Effectiveness of the KAI Model

The effectiveness of the KAI Model was measured by comparing students' literacy pretest and posttest scores. The trial involved 27 students. The average pretest score was

55.7, while the average posttest score increased to 77.2. The average increase of 21.5 points indicated that the KAI Model had a positive effect on students' literacy ability. Based on N-Gain calculation, the score was approximately 0.49, which falls into the moderate category.

Table 5. Pretest, Posttest, and N-Gain Analysis

Analysis Component	Score
Number of students	27
Total pretest score	1505
Total posttest score	2085
Average pretest score	55.7
Average posttest score	77.2
Average increase	21.5
N-Gain	0.49
N-Gain category	Moderate

The improvement in literacy outcomes indicates that the integration of collaborative, adaptive, and individual components had an impact on students' reading comprehension. Collaborative activities helped students discuss text content and expand understanding. Adaptive activities helped the teacher adjust task levels and learning support. Individual activities ensured that each student processed the reading content independently. Gillam et al. (2022), Eutsler and Perez (2022), and Lee and Al-Adeimi (2025) emphasize that explicit individual support is important for students with diverse literacy needs, while Kosh et al. (2017) shows that discussion quality can be an important indicator of reading comprehension development.

The results show that the KAI Model met the criteria of validity, practicality, and effectiveness. The model was valid because it obtained an average feasibility score of 91.1%; practical because it could be implemented by the teacher and received positive responses from users; and effective because it increased students' average literacy score from 55.7 to 77.2. Thus, the KAI Model can be considered a relevant literacy learning innovation for elementary schools with diverse student reading abilities.

The results of this study indicate that the development of the KAI Model as a literacy learning innovation at SD Negeri Balai Riam has strong theoretical and practical relevance. The model was developed to address literacy learning problems, including teacher-centered instruction, low student activity in reading and writing, limited variation in instructional strategies, and significant differences in students' reading abilities. The initial data showing that 60% of students could read fluently while 40% still struggled to read and understand texts confirms that literacy instruction in Grade IV required a model that was not uniform, but one that provided space for collaboration, instructional adjustment, and individual support according to students' ability levels.

The findings reinforce the importance of literacy learning that does not focus only on mechanical reading skills but also on comprehension, discussion, meaning-making, and the ability to communicate information. The KAI Model responds to this need through five learning stages: orientation and motivation, collaborative activities, adaptive activities, individual activities, and reflection and evaluation. These stages show that learning does not stop at reading texts but continues with group discussion, differentiated tasks, independent work, and reflection. This structure is consistent with the view that literacy is both a social and cognitive practice developed through interaction with texts, peers, teachers, and students' lived contexts. Literature on literacy education shows that collaborative and dialogic learning can support reading comprehension, vocabulary development, reasoning, and student engagement when teachers provide clear discussion structures and meaningful reading tasks (Goldman et al., 2016; Outlaw & Grifenhagen, 2024; Greenleaf et al., 2011; Park, 2021).

The collaborative aspect of the KAI Model is one of the main factors explaining students' increased engagement. During implementation, students worked in small groups to read story texts, discuss reading content, identify characters, determine main ideas, and write discussion results in student worksheets. These activities changed students' position from passive recipients of information into active participants who constructed understanding together. This finding is consistent with Bourgoin and Bouthillier (2021), who found that task-based learning through small groups can expand productive language use, increase peer interaction, strengthen learner autonomy, and encourage student engagement in early literacy contexts. Romero et al. (2025) also found that peer-mediated learning strategies, such as peer tutoring, cooperative learning, and collaborative learning, have meaningful effects on literacy achievement, especially reading outcomes.

The increase in student activity was also related to the fact that collaborative activities provided social support for students with weaker reading skills. When students read with peers, discussed stories, and developed group answers, students who experienced difficulties received assistance not only from the teacher but also from classmates. Interview results showed that students enjoyed learning through discussion, felt that reading stories with friends helped them understand the text, and found tasks easier because they could discuss them together. This response confirms that collaboration is not merely a grouping strategy, but a pedagogical mechanism that helps students understand texts through conversation, negotiation of meaning, and peer support.

The adaptive component of the KAI Model also contributed significantly to the success of literacy learning. In this study, the teacher adjusted learning activities according to students' ability levels by varying task difficulty and forms of support. Higher-achieving students were directed to analyze the moral message of the story, middle-level students identified the main idea of each paragraph, and students with basic reading ability answered simple questions about the text. This strategy shows that instructional adaptation is not only a variation of method but a pedagogical effort to ensure that every student can access literacy materials according to his or her ability. This is consistent with differentiated learning in the Merdeka Belajar framework, which emphasizes that instruction should respond to students' readiness, interests, and needs to improve literacy achievement, active participation, and motivation (Wijaya et al., 2024).

The findings also show that the adaptive approach helped teachers manage classroom heterogeneity. The teacher stated that adaptive instruction was very helpful for students with low reading ability because learning could be adjusted to students' capabilities, making them more active, more willing to initiate learning, and less burdened by tasks. However, the teacher also identified several challenges, including the need to adjust assignments to individual ability, classroom noise due to active group discussion, limited instructional time, the need for digital tools, the need for teacher training, and the presence of students who were not yet fluent readers. These challenges indicate that adaptive learning requires teacher readiness, well-prepared learning materials, effective classroom management, and adequate facilities. This is in line with literature emphasizing that collaborative, adaptive, and differentiated literacy learning requires contextual design, professional development, and attention to time and resource limitations (Dorris et al., 2024; Kim et al., 2021; Relyea et al., 2024; Larsari & Abouabdelkader, 2024).

The individual component of the KAI Model strengthened students' independence and responsibility for learning. After collaborative and adaptive activities, students still had to complete independent tasks, such as summarizing the text, answering

comprehension questions, and writing conclusions using their own words. This stage was important because literacy achievement should not only be measured at the group level but must also be visible in each student's ability to understand, process, and communicate text content individually. In the teaching module, the learning objectives explicitly included reading story texts fluently, identifying main ideas, drawing conclusions, presenting group discussion results collaboratively, and writing story conclusions independently.

From a theoretical perspective, this individual reinforcement relates to learner autonomy and personalized literacy support. Additional literature shows that individualized learning pathways, student choice, and scaffolded support help students become more independent and engaged learners. Task-based learning, flipped learning, station rotation, and blended learning have been shown to encourage independence, collaboration, and engagement when students are given opportunities to manage tasks actively (Larsari & Abouabdelkader, 2024; Suprpto et al., 2024). Therefore, the individual component of the KAI Model strengthens the personal dimension of literacy, while the collaborative and adaptive components strengthen its social and differentiated dimensions.

The validation results also demonstrate that the KAI Model has strong conceptual and technical quality. The model obtained an average feasibility score of 91.1%, consisting of 90% for media feasibility, 100% for material feasibility, and 83.3% for language feasibility. These results indicate that the KAI Model is appropriate in terms of learning tools, content, and language clarity. Minor revisions based on validator suggestions, such as improving language consistency and aligning media use, show that the development process involved refinement before classroom implementation. This is important in development research because a learning model should meet validity criteria before being tested in the field.

The practicality of the KAI Model was reflected in the implementation of its syntax and positive user responses. The teacher was able to implement the stages of learning, including explaining objectives, introducing the KAI Model, forming groups, facilitating discussion, providing adaptive instruction, guiding struggling students, assigning individual tasks, and conducting reflection. Students also showed positive activities, such as reading texts, cooperating in groups, discussing, expressing opinions, completing adaptive tasks, and working independently. Although some students were not yet able to draw accurate conclusions from texts, this finding indicates that higher-order literacy skills still need further strengthening through repeated practice, modeling, and feedback.

The effectiveness of the KAI Model was shown by the increase in students' average literacy score from 55.7 in the pretest to 77.2 in the posttest. This improvement indicates that learning with the KAI Model improved students' literacy ability after the intervention. The improvement can be explained by the learning mechanism: students read texts, discussed reading content, received tasks according to ability, completed individual work, and participated in reflection. This finding supports Kim et al. (2021) and Relyea et al. (2024), who found that content-rich literacy interventions involving academic discussion, vocabulary development, and meaningful tasks can improve domain knowledge and reading comprehension.

The strengths of the KAI Model are also visible in its contribution to cognitive, social, and affective aspects. Cognitively, the model helped improve reading comprehension, text analysis, and idea organization. Socially, it strengthened cooperation and communication among students. Affectively, it increased reading motivation and self-confidence. These three aspects indicate that literacy is not only an academic outcome but also a learning practice involving attitude, interaction, confidence, and independence. In the original manuscript, the KAI Model is described as having advantages because it

accommodates differences in students' abilities, improves social interaction, develops learning independence, supports literacy learning based on the Merdeka Curriculum, and is contextual to SD Negeri Balai Riam.

The contextuality of the KAI Model is another important contribution of this study. The model does not only combine collaborative, adaptive, and individual approaches but is also designed to fit the characteristics of an elementary school in a local area. In the Indonesian context, studies on bilingual project-based materials, differentiated learning under Merdeka Belajar, and blended learning show that literacy learning is stronger when it considers language, culture, student experience, and the local condition of schools (Sumarno et al., 2024; Wijaya et al., 2024; Suprpto et al., 2024). Thus, the KAI Model has the potential to become a locally contextualized literacy model that is closely connected to the needs of students, teachers, and schools.

Nevertheless, the findings should be interpreted proportionally. The trial was conducted in only one school and involved fourth-grade students, so generalization should be made carefully. The implementation period was also limited, and the model has not yet been tested across all grade levels. Literature also reminds us that collaborative, differentiated, or technology-enhanced approaches do not always produce the same effects in all contexts. Some studies show improvements in reading comprehension or domain knowledge but limited effects on engagement indicators, while studies on digital tools show positive effects that depend on design quality, device type, and implementation fidelity (Kim et al., 2021; Dorris et al., 2024).

Considering the empirical findings and supporting literature, the KAI Model can be considered a valid, practical, and effective literacy learning innovation in the context of SD Negeri Balai Riam. Theoretically, the model strengthens constructivist and sociocultural views that literacy develops through interaction, support, and meaningful experience. Practically, it provides a learning syntax that teachers can use to manage differences in student ability, increase engagement, and promote learning independence. From a policy perspective, the model is relevant to the Merdeka Curriculum, which emphasizes student-centered learning, differentiation, collaboration, and character development. Further research is recommended through trials across different classes, schools, and longer implementation periods so that the effectiveness of the model can be tested more comprehensively and sustainably.

CONCLUSION

Based on the results of the research and development process, the KAI Model (Collaborative, Adaptive, Individual) was proven to be valid, practical, and effective as an innovation in literacy learning at SD Negeri Balai Riam. The model was developed to respond to literacy instruction that had previously been teacher-centered, insufficiently varied, and not fully responsive to differences in students' abilities. Expert validation showed that the KAI Model was highly feasible, with media feasibility reaching 90%, material feasibility 100%, language feasibility 83.3%, and an overall feasibility average of 91.1%. The implementation of the model showed that its learning syntax could be applied effectively through orientation, group collaboration, adaptive instruction, individual tasks, and reflection. The effectiveness of the model was reflected in the increase in students' average literacy score from 55.7 in the pretest to 77.2 in the posttest, with an average improvement of 21.5 points. These findings indicate that the integration of cooperation, adaptive instructional strategies, and individual support can improve reading comprehension, participation, motivation, and students' learning independence. Therefore, the KAI Model contributes to the development of a contextual, student-centered literacy learning model aligned with the Merdeka Curriculum. Future studies

are recommended to test the KAI Model across broader grade levels, schools, and subjects so that its effectiveness can be strengthened more comprehensively.

RECOMMENDATIONS

Based on the findings of this study, several recommendations can be proposed. First, teachers are encouraged to use the KAI Model as an alternative strategy for literacy instruction because it combines collaborative learning, adaptive support, and individual learning tasks in one systematic learning sequence. In applying this model, teachers should carefully identify students' reading levels, provide differentiated tasks, facilitate group discussion, and give individual feedback so that each student can develop literacy skills according to his or her ability.

Second, schools should support the implementation of the KAI Model by providing adequate learning resources, such as contextual reading texts, student worksheets, visual or digital media, and literacy-rich classroom facilities. School leaders are also encouraged to organize teacher training or professional development programs focused on differentiated literacy instruction, classroom management for collaborative learning, and the use of local wisdom as literacy content.

Third, the KAI Model should be further developed by integrating more varied local cultural materials, such as folktales, environmental texts, community stories, and local values from Central Kalimantan. This integration can make literacy learning more meaningful and strengthen students' cultural identity.

Fourth, future researchers are recommended to test the KAI Model in broader contexts, including different grade levels, schools, subjects, and regions. Further studies may also use control groups, longer implementation periods, and more comprehensive literacy instruments to obtain stronger evidence of the model's effectiveness.

Finally, the model can be improved through the use of digital technology to support adaptive and individual learning, especially for students who need additional reading practice and personalized feedback.

AUTHOR CONTRIBUTIONS

Caecillia Supraptini contributed to the conceptualization of the study, development of the KAI Model, research design, data collection, data analysis, interpretation of findings, and preparation of the original manuscript. The author was also responsible for developing the teaching module, student worksheets, literacy assessment instruments, and implementation procedures used in the study. The author conducted the classroom trial, analyzed expert validation results, evaluated the effectiveness of the model through pretest and posttest data, and revised the manuscript based on academic feedback. The author has read and approved the final version of the manuscript.

DAFTAR PUSTAKA

- Astarina, R., Yerizon, Y., Bentri, A., & Zainil, M. (2024). Development of interactive learning media assisted by Google Sites in building materials for elementary schools grade V. *Jurnal Penelitian Pendidikan IPA*, 10(SpecialIssue), 226–233. <https://doi.org/10.29303/jppipa.v10ispecialissue.8555>
- Borg, W. R., & Gall, M. D. (2003). *Educational research: An introduction*. Longman.
- Bourgoin, R., & Bouthillier, J. L. (2021). Task-based language learning and beginning language learners: Examining classroom-based small group learning in Grade 1 French immersion. *Canadian Journal of Applied Linguistics*, 24(2), 70–98. <https://doi.org/10.37213/cjal.2021.31378>
- Carlisle, J. F., Kelcey, B., & Berebitsky, D. (2013). Teachers' support of students' vocabulary learning during literacy instruction in high poverty elementary schools. *American*

- Educational Research Journal*, 50(6), 1360–1391. <https://doi.org/10.3102/0002831213492844>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.
- Deane, P., Sabatini, J., Feng, G., Sparks, J. R., Yi, S., Fowles, M. E., O'Reilly, T., Jueds, K., Krovetz, R., & Foley, C. (2015). Key practices in the English language arts (ELA): Linking learning theory, assessment, and instruction. *ETS Research Report Series*, 2015(2), 1–29. <https://doi.org/10.1002/ets2.12063>
- Dorris, C., Winter, K., O'Hare, L., & Lwoga, E. T. (2024). Mobile device use in the primary school classroom and impact on pupil literacy and numeracy attainment: A systematic review. *Campbell Systematic Reviews*, 20(2). <https://doi.org/10.1002/cl2.1417>
- Drew, S. V., & Thomas, J. (2021). Reframing literacy in the discipline of science with the disciplinary literacy observation tool (DLOT). *Learning Disabilities Research and Practice*, 37(1), 64–79. <https://doi.org/10.1111/ldrp.12270>
- Eutsler, L., & Perez, A. (2022). Culturally relevant model for digital language and literacy instruction. *Language and Literacy*, 24(2), 107–132. <https://doi.org/10.20360/langandlit29576>
- Fitria, T. N. (2023). Understanding basic literacy and information literacy for primary students. *Journal of Contemporary Issue in Elementary Education*, 1(2), 103–121. <https://doi.org/10.33830/jciee.v1i2.6181>
- Gillam, S. L., Vaughn, S., Roberts, G., Capin, P., Fall, A., Israelsen-Augenstein, M., Holbrook, S., Wada, R., Hancock, A., Fox, C., Dille, J., Magimairaj, B. M., & Gillam, R. B. (2022). Improving oral and written narration and reading comprehension of children at-risk for language and literacy difficulties: Results of a randomized clinical trial. *Journal of Educational Psychology*. <https://doi.org/10.1037/edu0000766>
- Goldman, S. R., Snow, C. E., & Vaughn, S. (2016). Common themes in teaching reading for understanding: Lessons from three projects. *Journal of Adolescent & Adult Literacy*, 60(3), 255–264. <https://doi.org/10.1002/jaal.586>
- Greenleaf, C., Litman, C., Hanson, T., Rosen, R., Boscardin, C., Herman, J. L., Schneider, S., Madden, S., & Jones, B. (2011). Integrating literacy and science in biology. *American Educational Research Journal*, 48(3), 647–717. <https://doi.org/10.3102/0002831210384839>
- Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, 66(1), 64–74. <https://doi.org/10.1119/1.18809>
- Halik, A., Salam, R., Rukayah, R., & Hafid, A. (2023). The analysis of the educators' role towards the elementary school students' literacy problem through the heutagogy approach. *Retorika: Jurnal Bahasa, Sastra, dan Pengajarannya*, 15(2). <https://doi.org/10.26858/retorika.v15i2.47164>
- Istiq'faroh, N., Wibowo, A. H., Lestari, W. M., Murni, A. W., & Mahsunah, E. (2022). Strengthening school literature movement in elementary school during the Covid-19 pandemic. *Al-Ishlah: Jurnal Pendidikan*, 14(3), 3903–3914. <https://doi.org/10.35445/alishlah.v14i3.1132>
- Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38(5), 365–379. <https://doi.org/10.3102/0013189X09339057>
- Kim, J. S., Burkhauser, M., Mesite, L., Asher, C. A., Relyea, J. E., Fitzgerald, J., & Elmore, J. (2021). Improving reading comprehension, science domain knowledge, and reading engagement through a first-grade content literacy intervention. *Journal of Educational Psychology*, 113(1), 3–26. <https://doi.org/10.1037/edu0000465>

- Kosh, A. E., Greene, J. A., Murphy, P. K., Burdick, H. O., Firetto, C. M., & Elmore, J. (2017). Automated scoring of students' small-group discussions to assess reading ability. *Educational Measurement: Issues and Practice*, 37(2), 20–34. <https://doi.org/10.1111/emip.12174>
- Larsari, V. N., & Abouabdelkader, H. (2024). An investigation into flipped learning classroom (FLC) of EFL sixth grade students' grammar literacy development: Implications for student-centered approach. *International Journal of Education and Literacy Studies*, 12(1), 13–24. <https://doi.org/10.7575/aiac.ijels.v.12n.1p.13>
- Lee, R., & Al-Adeimi, S. (2025). Supporting literacy through the Justice and Dialogic Education (JADE) framework. *Reading Research Quarterly*, 60(4). <https://doi.org/10.1002/rrq.70062>
- Mufidah, I., Harsiati, T., & Nurchasanah. (2023). Progress in International Reading Literacy Study-based reading competency assessment instrument with culturally educative texts for primary school students. *Jurnal Penelitian Pendidikan IPA*, 9(SpecialIssue), 677–685. <https://doi.org/10.29303/jppipa.v9ispecialissue.5993>
- MZ, A. S. A., Aprillya, M. R., & Bianto, M. A. (2022). Science augmented reality program media for elementary school students. *JPI (Jurnal Pendidikan Indonesia)*, 11(3), 457–465. <https://doi.org/10.23887/jpiundiksha.v11i3.41378>
- Nadifa, M., & Zulvani, N. V. (2024). School literacy policy as an effort to strengthen 21st-century skills. *Indonesian Journal of Educational Development*, 5(1), 16–34. <https://doi.org/10.59672/ijed.v5i1.3527>
- Nurcahyoko, K., Anniurwanda, P., & Sudirjo, E. (2024). Investigating the factors influencing literacy skills among young students in rural areas of Indonesia. *Language Circle: Journal of Language and Literature*, 18(2), 333–341. <https://doi.org/10.15294/lc.v18i2.50287>
- Outlaw, J. K., & Grifenhagen, J. F. (2024). Theorizing digital dialogic comprehension pedagogy with rural primary teachers: A relational praxis of knowledge, space, and time. *Literacy Research: Theory, Method, and Practice*, 73(1), 280–301. <https://doi.org/10.1177/23813377241289994>
- Park, J. C. (2021). Cultivating STEAM literacy: Emphasizing the implementation of the arts through reading practices supporting the Asian diaspora. *Asia-Pacific Science Education*, 7(2), 586–614. <https://doi.org/10.1163/23641177-bja10034>
- Pereira, J., Tan, S., Li, L., & Purnama, A. (2020). Developing a mathematics learning media to explain formula of area of kite using Hawgent. *Indonesian Journal of Science and Mathematics Education*, 3(3), 272–281. <https://doi.org/10.24042/ijsme.v3i3.7391>
- Prihartini, A. A., Ali, N. B., & Fitri, H. A. (2023). The role of school literacy movement (SLM) in increasing student interest in reading: A literature review. *Jurnal Tatsqif*, 21(1), 15–34. <https://doi.org/10.20414/jtq.v21i1.7409>
- Rahayu, W., Suyono, S., Dewi, R. S. I., & Arifin, S. (2024). Implementation of the GELIS program in the school literacy movement at elementary school. *JTP - Jurnal Teknologi Pendidikan*, 26(1), 84–95. <https://doi.org/10.21009/jtp.v26i1.43680>
- Rahmi, I. A., Santi, A. N., Ramadhan, S., & Sukma, E. (2024). Teachers' perceptions of literacy implementation in elementary schools. *Lectura: Jurnal Pendidikan*, 15(1), 184–194. <https://doi.org/10.31849/lectura.v15i1.18153>
- Reigeluth, C. M. (2013). *Instructional-design theories and models: A new paradigm of instructional theory*. Routledge.
- Relyea, J. E., Davis, D. S., Dawson, S. D., & Dobis, C. (2024a). Elementary school teachers' enactment of a content literacy curriculum in a virtual tutoring program for multilingual students. *Education Sciences*, 14(7), 788. <https://doi.org/10.3390/educsci14070788>

- Relyea, J. E., Kim, J. S., Rich, P., & Fitzgerald, J. (2024b). Effects of tier 1 content literacy intervention on early-grade English learners' reading and writing: Exploring the mediating roles of domain-specific vocabulary and oral language proficiency. *Journal of Educational Psychology*, 116(7), 1172–1195. <https://doi.org/10.1037/edu0000882>
- Romero, M. E., Burns, M. K., Wan, H. T., Abdelnaby, H., & Crawford, T. J. (2025). A meta-analysis on the effects of peer tutoring on emergent bilinguals' academic achievement. *Psychology in the Schools*, 62(6), 1953–1965. <https://doi.org/10.1002/pits.23443>
- Sabatini, J., Graesser, A. C., Hollander, J., & O'Reilly, T. (2023). A framework of literacy development and how AI can transform theory and practice. *British Journal of Educational Technology*, 54(5), 1174–1203. <https://doi.org/10.1111/bjet.13342>
- Safitri, I. (2024). Exploring the utilization of folktales as reading materials for EFL students. *Journal of English as a Foreign Language Education*, 4(2), 115. <https://doi.org/10.26418/jefle.v4i2.74899>
- Sparapani, N., Carlisle, J. F., & Connor, C. M. (2018). Observations of vocabulary activities during second- and third-grade reading lessons. *Education Sciences*, 8(4), 198. <https://doi.org/10.3390/educsci8040198>
- Steinke, K., & Wildsmith-Cromarty, R. (2019). Securing the FORT: Capturing reading pedagogy in the foundation phase. *Per Linguam*, 35(3). <https://doi.org/10.5785/35-3-806>
- Sugiyono. (2019). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta.
- Suhardiman, A., Liastamin, A., Alambana, B. M., & Kurniawansyah, E. (2024). Implementation of Kampus Mengajar 4 program to equalize the quality of basic education at First Sekunyit Public Elementary School. *Progres Pendidikan*, 5(1), 88–92. <https://doi.org/10.29303/prospek.v5i1.660>
- Sumarno, W. K., Riyantoko, P. A., & Shodikin, A. (2024). Effectiveness of bilingual project-based materials to facilitate literacy and numeracy teaching. *TEM Journal*, 68–76. <https://doi.org/10.18421/tem131-07>
- Suprpto, I., Amriyah, C., & Prihatmojo, A. (2024). Blended learning in an effort to overcome learning materials in elementary schools. *Al-Hayat: Journal of Islamic Education*, 8(1), 134. <https://doi.org/10.35723/ajie.v8i1.447>
- Thiagarajan, S., Semmel, D. S., & Semmel, M. I. (1974). *Instructional development for training teachers of exceptional children: A sourcebook*. Indiana University.
- Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners* (2nd ed.). ASCD.
- Triwahyuningtyas, D., Mahmuda, N. E., & Yulianti, Y. (2020). Developing module for two-dimensional course based on ethnomathematics for fourth grade of elementary school student. *Al Ibtida: Jurnal Pendidikan Guru MI*, 7(2), 166. <https://doi.org/10.24235/alibtida.snj.v7i2.6314>
- Ulpiah, U., Rohmah, S., & Saefudin, A. (2022). Implementation of school literacy movement in Islamic Primary School Al Istiqomah. *Al-Aulad: Journal of Islamic Primary Education*, 5(2), 57–67. <https://doi.org/10.15575/al-aulad.v5i2.21166>
- Wahyuni, D. (2023). The effect of language literacy and numerical literacy on the result of the Minimum Competency Assessment (AKM) of SMAN Ploso Jombang. *Edunesia: Jurnal Ilmiah Pendidikan*, 4(1), 225–237. <https://doi.org/10.51276/edu.v4i1.315>
- Wijaya, B. A., Wantini, W., Perawironegoro, D., & Bustam, B. M. R. (2024). The impact of differentiated learning in the Merdeka Belajar Curriculum on elementary school literacy as the object of the Kampus Mengajar program. *Jurnal Ilmiah Sekolah Dasar*, 8(1), 22–33. <https://doi.org/10.23887/jisd.v8i1.68107>

- Yustisia, K. K., & Salsabila, D. L. E. (2023). Reading difficulties among elementary students in a rural area: A qualitative study. *EnJourMe: English Journal of Merdeka*, 8(1), 106–112. <https://doi.org/10.26905/enjourme.v8i1.10733>
- Zuo, X., & Ives, D. (2023). Technology-assisted reading instruction for English language learners: A methodological review. *ECNU Review of Education*, 7(2), 258–282. <https://doi.org/10.1177/20965311231179490>