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Improving PISA Reading Literacy: The Effectiveness of KWL Strategy for Middle School Students' Comprehension of Descriptive Texts

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ABSTRACT

Purpose of the study: This classroom action research aimed to investigate whether the Know-Want-Learned (KWL) strategy could improve the reading comprehension of descriptive texts among seventh-grade junior high school students, with implications for addressing the foundational literacy skills measured by international assessments such as PISA (Programme for International Student Assessment).

Methodology: Employing the Kemmis & McTaggart model over two cycles, this study collected data using pre-tests, post-tests, observation sheets, teacher interviews, and student questionnaires. While qualitative data were examined thematically to gauge involvement and metacognitive growth, quantitative data from tests were assessed by computing mean scores and the proportion of students passing the Minimum Mastery Criterion (KKM).

Main Findings: Student outcomes were considerably enhanced by the application of the KWL method. From 20% in the pre-test to 40% in post-test 1 and then to 80% in post-test 2, the proportion of students passing the KKM rose. Increased student engagement, excitement, and the growth of metacognitive techniques like reflection and inquiry that complement the fundamental PISA reading literacy competencies were all demonstrated by qualitative data.

Novelty/Originality of this study: This study offers empirical evidence from a junior high school setting in Indonesia, explicitly connecting the KWL technique to the development of higher-order reading skills pertinent to PISA frameworks as well as better classroom performance. It demonstrates KWL as a practical, low-tech strategy that can help bridge the gap between daily instruction and the literacy competencies emphasized in global assessments.

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1. INTRODUCTION

Reading comprehension is a foundational skill in second language acquisition, essential for academic success and lifelong learning. It involves the complex process of constructing meaning from written text, which goes beyond mere word recognition to include interpretation, inference, and integration of prior knowledge [1]-[3]. For English as a Foreign Language (EFL) learners, particularly at the junior high school level, mastering

reading comprehension presents a significant challenge, often hindered by limited vocabulary, unfamiliar grammatical structures, and a lack of effective reading strategies [4]-[6].

Indonesia's results in international evaluations further emphasize how urgent it is to improve reading literacy. Indonesian students continue to perform below the OECD average in reading literacy, with specific difficulties in higher-order comprehension skills like analyzing and reflecting on texts, according to the most recent PISA data [7]-[9]. This deficit underscores the need for evidence-based instructional strategies that can develop not only basic comprehension but also the critical reading competencies emphasized in PISA frameworks.

Descriptive text, a genre commonly taught in Indonesian junior high schools, requires students to identify specific details, main ideas, and the generic structure of a description. However, students frequently struggle with this text type, finding it difficult to extract and organize key information, which leads to low comprehension scores and diminished motivation [10]-[12]. Traditional, teacher-centered methods of reading instruction, which often prioritize rote memorization and translation, have proven insufficient in engaging students and fostering deep understanding.

Interactive and student-centered approaches have been promoted as solutions to these problems. The Know-Want-Learned (KWL) method, created by Siti Komala Putri, is one such tactic [13]. The reading process is divided into three stages by this metacognitive technique: reflecting on recently learned material (What I Learned), establishing a reading goal (What I Want to Know), and activating past knowledge (What I Know) [14], [15]. The KWL technique uses a straightforward chart to help children read more intentionally, purposefully, and reflectively.

Therefore, this study not only addresses classroom-level challenges in reading descriptive texts but also contributes to the broader national agenda of improving reading literacy outcomes that align with PISA competencies. By implementing the KWL strategy which inherently promotes reflection, evaluation, and purposeful reading this research examines how a metacognitive approach can potentially address the specific skill gaps identified in Indonesia's PISA performance.

First, the three articles focus on the use of multimodal and visual media or approaches, such as picture storybooks [16], application-based telenursing [17], and syllable methods with illustrated cards [18]. In contrast, the proposed study focuses on the KWL strategy a metacognitive strategy that emphasizes activating prior knowledge, setting reading goals, and post-reading reflection. A gap arises because the KWL strategy has not been deeply explored in the context of improving reading literacy for PISA preparation, particularly for descriptive texts among seventh-grade students. The existing articles emphasize the visual and technical aspects of media, while the KWL strategy offers a cognitive and metacognitive approach that trains students to independently manage comprehension a dimension that is still limited in literacy studies in Indonesia.

Second, the existing studies were largely conducted in elementary education settings (grades I–II) or in health contexts, whereas this research targets seventh-grade junior high school students who face more complex literacy challenges, especially in facing international assessments such as PISA [19]-[21]. Furthermore, the texts used in previous studies tend to be narrative or functional, while this research specifically focuses on descriptive texts a genre that frequently appears in PISA but has not been extensively studied in terms of specific comprehension strategies [22]-[24]. Thus, this study has the potential to fill the gap between commonly used reading learning strategies (such as global methods, SAS, or visual media) and metacognitive approaches like KWL, which have proven effective in international contexts but are still rarely tested in Indonesia, particularly for improving PISA literacy scores.

This study is novel because it attempts to incorporate the metacognitive Know-Want-Learned (KWL) strategy into the Indonesian reading literacy context, an area that is still understudied, especially when it comes to getting students ready for international literacy tests like PISA at the seventh-grade level [25], [26]. Unlike previous studies, which tend to rely on visually and multimodally driven approaches (such as picture storybooks, illustrated word cards, or digital applications), this research emphasizes the development of students' cognitive capacity and self-regulation through systematic thinking processes before, during, and after reading descriptive texts [27]-[29]. The KWL strategy is selected not only as a tool to improve reading comprehension but also as a means to train students in activating prior knowledge, formulating reading purposes, and engaging in critical reflection on acquired information a metacognitive dimension seldom addressed in literacy studies in Indonesia. Furthermore, this study addresses a thematic gap by focusing on the descriptive text genre, which is a significant component of PISA questions but has not been widely examined in reading intervention studies at the junior high school level. By combining a cognitive strategy approach, a PISA oriented evaluation framework, and a focus on descriptive texts for early adolescent learners, this research not only offers a more structured and reflective reading learning model but also provides empirical contributions to systematic efforts aimed at enhancing Indonesia's literacy competitiveness on the global stage [30], [31].

The implications of this study are multidimensional, encompassing theoretical, pedagogical, and policy dimensions. Theoretically, the findings can enrich the scholarly discourse on reading literacy in Indonesia by strengthening the metacognitive framework in learning, specifically through empirical validation of the KWL strategy for descriptive texts and junior high school students [32]-[34]. The primary pedagogical implication is

providing teachers with a structured, evidence-based practical guide for implementing the KWL strategy in the classroom, thereby not only enhancing reading comprehension but also fostering students' reflective and independent thinking habits competencies crucial for tackling complex assessments like PISA. The findings of this study can be used as a guide by curriculum designers and educational policymakers to create literacy modules or teacher training programs that methodically incorporate metacognitive techniques into the national curriculum, especially in deliberate and persistent attempts to raise Indonesia's standing in the world literacy rankings [35]-[37]. More broadly, this study encourages a paradigm shift in literacy approaches from merely technical-mechanical skills toward the mastery of higher-order thinking processes.

Indonesia's continually poor performance in international literacy tests, especially the Programme for International Student Assessment (PISA), where Indonesian pupils often scored lower than the global average in reading comprehension, highlights the urgency of this study. Higher-order literacy abilities are critical for academic performance, informed citizenship, and competitiveness in the global information economy. This lack reflects a systemic gap in their development [38]-[40]. While previous educational interventions in Indonesia have often emphasized rote learning or visual-aid dependency, there remains a critical need for pedagogical approaches that actively cultivate metacognitive awareness and self-regulated learning competencies directly aligned with the demands of PISA style assessments. Furthermore, the transition from elementary to junior high school represents a pivotal stage where students encounter more complex texts and evaluative expectations, yet targeted literacy strategies for this age group especially concerning descriptive texts remain underdeveloped in both research and practice. By focusing on the KWL strategy within the context of PISA-oriented literacy development, this study addresses a timely and strategic imperative, equipping Indonesian learners with a scalable, evidence-based cognitive tool to navigate informational texts critically and independently. Without such focused interventions, Indonesia risks perpetuating cycles of low literacy achievement, ultimately limiting the intellectual and socioeconomic potential of its future generations.

2. RESEARCH METHOD

In accordance with Kemmis & McTaggart's cycle model, which includes planning, acting, observing, and reflecting, this study used a Classroom Action Research (CAR) design [41]. The CAR technique was chosen because it may effectively address real-world classroom issues and enhance teaching methods through reflective, iterative cycles carried out in an authentic learning environment [42]. The research was conducted over two cycles to systematically implement, observe, and refine the use of the KWL strategy.

2.1. Research Context and Participants

The research was conducted at junior high school 13, Tangerang city Selatan during the 2019/2020 academic year. The participants were 40 students (class VII-4), selected through purposive sampling based on the teacher's identification of the class having significant difficulties in reading comprehension, particularly with descriptive texts. The English teacher of the class also participated as a collaborator and observer.

2.2. Data Collection and Instruments

To guarantee triangulation, information was gathered from both quantitative and qualitative sources [43]. Tests: Pre-test, post-test 1, and post-test 2 all used a 20-item multiple-choice reading comprehension test on descriptive texts. The cooperating English teacher verified the tests' content. Observation, Structured observation sheets were used by the collaborating teacher to record student activities (enthusiasm, participation in KWL steps) and teacher performance during implementation. Interview, A semi-structured interview was conducted with the English teacher before and after the CAR to understand the initial challenges and her perception of the strategy's impact. Questionnaire, A simple yes/no questionnaire was administered to students after the intervention to gauge their perception of and response to the KWL strategy.

2.3. Data Analysis

The mean score and the proportion of students who met or exceeded the Minimum Mastery Criterion (*Kriteria Ketuntasan Minimal*/KKM) of 75 were computed in order to assess the quantitative data from the tests. The percentage gain formula was used to determine the improvement [44]. Themes pertaining to student involvement and learning barriers were identified by descriptive analysis of qualitative data from observations, interviews, and surveys using data reduction, data display, and conclusion drawing [45]. Positive developments in qualitative engagement indicators and ≥75% of students attaining a score equal to or above the KKM (75) were established as the action's success criteria.

Table 1. Blueprint of Reading Comprehension Test

Reading Comprehension Indicator	Number of Items	Item Number
Identifying main idea	4	1, 6, 11, 16
Finding specific information	8	2, 4, 7, 9, 12, 14, 17, 19
Determining reference	3	3, 8, 13
Inferring meaning	3	5, 10, 18
Understanding vocabulary in context	2	15, 20
Total	20	

j2.4. Research Procedure

The procedure for each cycle is outlined in Figure 1 and described below.

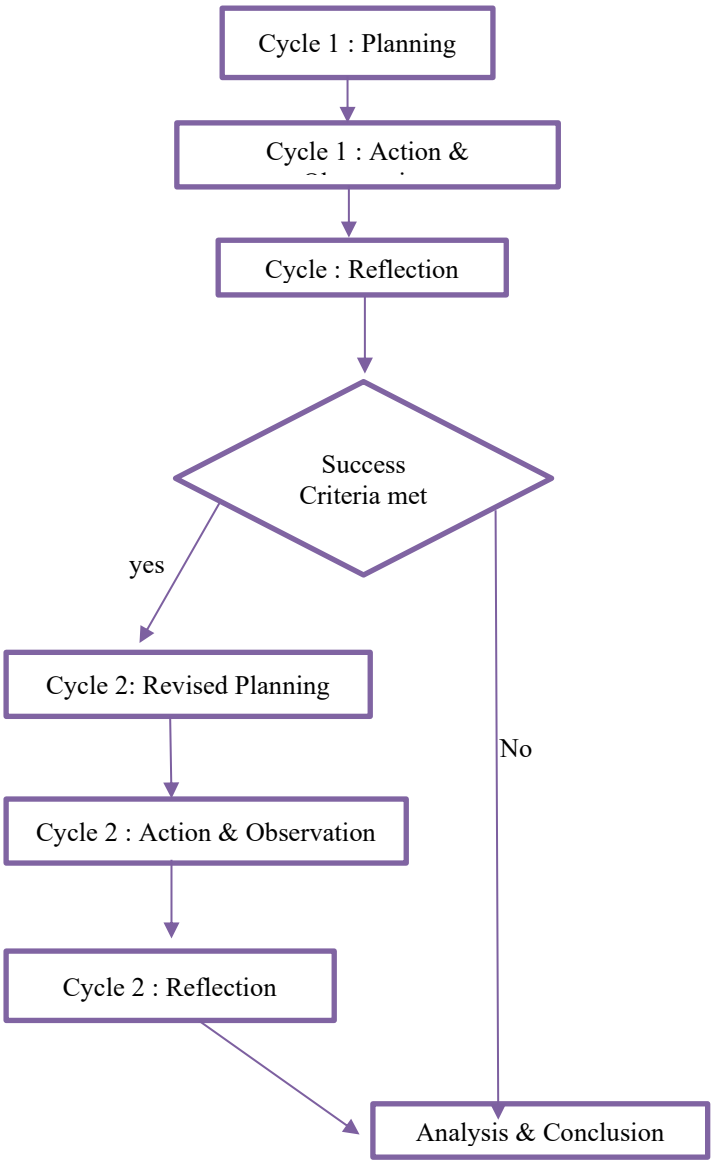

Figure 1. Research Procedure Based on Kemmis & McTaggart's CAR Model

Based on preliminary observations and a pre-test, a lesson plan integrating the KWL strategy for descriptive text was developed. A pre-test, observation sheets for student and instructor activities, and a post-test for cycle 1 were among the tools. The researcher acted as the teacher, implementing the KWL strategy. The English teacher acted as an observer, documenting the process using structured observation sheets focused on student engagement and implementation fidelity. Results from post-test 1 and observation notes were analyzed. The reflection identified that while some students were more active, others remained passive, and time management for group discussions was challenging.

The lesson plan was refined based on Cycle 1 reflection. Revisions included clearer instructions for group roles within the KWL activity, the use of a timer to manage discussion phases, and the integration of simple reward to motivate quieter students. The revised plan was implemented. Observation focused on the effectiveness of the new management strategies and increased participation from previously passive students. Data from post-test 2 and observations were analyzed. As the success criteria were met, the cycles were concluded, and final data analysis commenced.

3. RESULTS AND DISCUSSION

The results of the two Classroom Action Research (CAR) cycles are shown in this section along with a discussion of their implications. The quantitative data (pre-test, post-test 1, and post-test 2 scores) and qualitative data (observations, interviews, and questionnaires) were analyzed to produce the results. These results are interpreted in the discussion in light of the theoretical framework and body of existing research.

3.1. Quantitative Results: Improvement in Reading Comprehension Scores

The primary quantitative measure of the KWL strategy's effectiveness was student performance on standardized reading comprehension tests. Table 2 summarizes the mean scores and passing rates across the three testing phases.

Table 2. Students' Reading Comprehension Test Results

Test Phase	Mean Score	Students Passing KKM (≥75)	Percentage Passing KKM
Pre-test	64.5	8 out of 40	20%
Post-test 1 (Cycle 1)	71.2	16 out of 40	40%
Post-test 2 (Cycle 2)	80.8	32 out of 40	80%

The progressive improvement from 20% to 80% of students passing the KKM demonstrates not only mastery of basic comprehension but also the development of competencies aligned with PISA reading literacy domains. The KWL strategy's emphasis on *activating prior knowledge* (K) relates to PISA's 'evaluating and reflecting' dimension, while *setting purposes for reading* (W) directly corresponds to PISA's 'engaging with texts' competency. The significant gains in post-test 2 (80% passing) suggest that structured metacognitive strategies like KWL may address the specific gaps in 'reflective' and 'evaluative' skills where Indonesian students traditionally underperform in PISA assessments.

The data indicates a clear positive trajectory. The pre-test mean score of 64.5, with only 20% of students meeting the KKM, confirmed the initial problem of low reading comprehension. After the first implementation cycle, the mean score rose to 71.2, and the passing rate doubled to 40%. This initial improvement suggests that the KWL strategy began to positively affect student learning. The most significant gain occurred after Cycle 2, where the mean score reached 80.8 and the passing rate achieved the study's success criterion of 80%. The percentage of improvement from the pre-test to each post-test was calculated using the standard gain score formula:

$$P = \frac{y_n - y}{y} \text{ X } 100\% \qquad ...(1)$$

Where P is the percentage of improvement, y is the pre-test mean score, and y_n is the post-test mean score. The improvement from pre-test to post-test 1 was 10.4%, while from pre-test to post-test 2 it was 25.3%. This substantial increase from Cycle 1 to Cycle 2 underscores the importance of the reflective and iterative nature of CAR. The refinements made after Cycle 1, such as better time management and structured group roles, were crucial in optimizing the strategy's impact, leading to a more effective implementation in Cycle 2.

3.2. Qualitative Results: Student Engagement and Learning Process

Qualitative data from observations and questionnaires provided depth to the numerical scores, revealing changes in the classroom dynamic and student behavior.

3.2.1. Student Engagement and Participation

Observations from Cycle 1 noted that students appeared curious during the “K” (Know) phase, actively brainstorming what they already knew about topics like “My Pet” or “Famous Place.” However, the “W” (Want to Know) phase was initially challenging, as students were unaccustomed to formulating their own questions. The researcher and collaborating teacher observed that group discussions were often dominated by a few confident students, while others remained passive.

Based on this reflection, Cycle 2 introduced more scaffolding. The teacher modeled how to create questions from a topic, provided question stems (e.g., "What does it look like?", "Why is it famous? "), and assigned specific roles within groups (e.g., recorder, questioner, presenter). Observations during Cycle 2 showed a marked difference. Student participation became more balanced and purposeful. The post-intervention

questionnaire revealed that 85% of students agreed that the KWL chart helped them focus while reading, and 78% felt more confident to share ideas in their group. This aligns with the constructivist view that learning is an active process of meaning-making, facilitated by structured social interaction [45]-[47]. The KWL chart served as a visual and organizational scaffold that made the reading process more transparent and manageable for students.

The observed shift from passive reception to active questioning represents a crucial development toward PISA-level reading literacy. PISA emphasizes that proficient readers actively interrogate texts a skill systematically cultivated in the 'W' phase of KWL. The 85% of students reporting that KWL helped them focus indicates growth in the sustained engagement necessary for complex PISA reading tasks.

3.2.2. Teacher and Student Reflections

The interview with the collaborating English teacher after Cycle 2 highlighted a shift in her perspective. She stated, *"The KWL strategy changed my role from being the sole source of information to a facilitator. I could see students connecting their own experiences to the text and taking ownership of their learning."* This reflects the metacognitive foundation of KWL, which empowers learners to direct their own inquiry [48]-[50].

From the students' perspective, the "L" (Learned) phase was frequently mentioned in questionnaires as the most rewarding. One student noted, *"I liked filling in the 'L' column because I could see clearly what new things I understood, and it helped me remember the lesson."* This act of summarizing and reflecting is a critical cognitive strategy that consolidates learning and enhances retention [51], [52].

3.3. Discussion: Integrating Quantitative Gains with Qualitative Shifts

The integration of results demonstrates that the KWL strategy's success is twofold: it improved measurable comprehension outcomes while simultaneously transforming the learning environment. First, the significant score improvement from Cycle 1 to Cycle 2 can be directly linked to the qualitative refinements in pedagogical execution. The initial 40% passing rate after Cycle 1 showed potential, but the persistence of passive learners and unstructured time limited effectiveness. By addressing these issues in Cycle 2 through explicit instruction on question formulation and cooperative learning structures, the strategy became more accessible to all students. This supports findings by Asdi & Sumartiningsih [53], who argue that the KWL strategy's power is fully unlocked when teachers skillfully guide the brainstorming and questioning phases. Second, the strategy addressed a key problem identified in the introduction: student passivity and low motivation. The quantitative gain (from 20% to 80% passing KKM) was mirrored by the qualitative shift towards active participation. The KWL framework provided a clear purpose for reading to answer their own questions in the "W" column. This aligns with Brown's principle of "identifying the purpose in reading" as a core strategy for efficient comprehension [54]. When students generated their own questions, their engagement transitioned from extrinsic (completing a teacher's task) to intrinsic (seeking answers to their own curiosities). Furthermore, this study extends the findings of previous research like Nurul [55] and Dewa Made [56] by providing a detailed, process-oriented account from the CAR perspective. While those studies confirmed KWL's effectiveness in improving test scores, this research illustrates *how* those improvements were achieved in a real classroom context through iterative lesson refinement, scaffolding for metacognitive skills, and fostering collaborative dialogue. It confirms that KWL is not merely a worksheet but a dynamic instructional process that, when implemented reflectively, can successfully address the challenges of teaching descriptive text comprehension to young EFL learners. In summary, the findings clearly show that the KWL technique is a successful intervention for raising seventh-grade students' reading comprehension of descriptive texts. Its effectiveness is contingent upon careful implementation that includes modeling, scaffolding for question generation, and promoting collaborative learning. The study demonstrates that combining this metacognitive strategy with the reflective practice of CAR can lead to substantial improvements in both learning outcomes and classroom engagement.

The findings offer promising implications for addressing Indonesia's challenges in PISA reading assessments. First, the KWL strategy's structured approach to *purpose-setting* (Want to Know) directly develops the "task management" skills that are weak among Indonesian students in PISA, who often struggle with identifying relevant information for specific purposes. Second, the *reflection phase* (Learned) cultivates the evaluative thinking required for PISA items that ask students to assess text credibility or author purpose skills where Indonesian students score significantly below OECD averages [57]-[59]. Third, the collaborative nature of KWL implementation mirrors PISA's recognition of reading as a social practice, preparing students for real-world literacy tasks. While this study focused on descriptive texts, the metacognitive framework of KWL is transferable to the diverse text types encountered in PISA, from narratives to exposition and argumentation. Future curriculum development could explicitly link KWL phases to PISA reading processes, creating a direct pathway from classroom practice to international competency standards.

This article has several gaps with the studies that have been conducted. The first article [60] comprehensively reviews the effectiveness of various graphic organizers including KWL in improving reading comprehension skills at various levels of education. However, this research has not yet addressed the specific application aspect for seventh-grade students, especially within the framework of developing reading literacy

aligned with international assessment standards such as PISA. The second article [61] does examine the use of the KWL strategy in teaching descriptive texts for EFL learners. However, its nature is still a literature review and therefore does not present direct empirical evidence regarding the strategy's impact on improving seventh-grade students' reading skills, particularly in the context of preparing for global literacy assessments. Meanwhile, the third article [62] emphasizes the importance of formulating intended learning outcomes and utilizing graphic organizers such as KWL to increase motivation and learning outcomes, but it does not integrate the reading literacy assessment dimensions that refer to the PISA competency framework.

This study aims to fill this gap by conducting an empirical evaluation of the impact of implementing the KWL strategy on descriptive text reading comprehension in a population of seventh-grade students, and explicitly linking it to the development of reading literacy competencies relevant to the PISA requirements. The three articles analyzed consistently demonstrate that the KWL strategy is effective in activating priority schemata, increasing cognitive engagement, and encouraging independent learning However, no research has specifically examined the extent to which this strategy can develop students' analytical, evaluative, and reflective abilities in comprehending texts competencies that are at the core of PISA reading literacy. Furthermore, this study will also consider aspects of learning motivation and student engagement as supporting variables, as explained in the third article, to provide a holistic and evidence-based perspective on the application of KWL in the context of literacy learning oriented towards international outcomes[63], [64].

This study offers significant novelty by integrating the Know-Want-Learned (KWL) strategy into a PISA (Programme for International Student Assessment)-oriented reading literacy development framework, particularly for seventh-grade students, who have rarely been the focus of previous empirical studies. Although KWL's efficacy has been extensively researched in relation to learning English as a foreign language (EFL) and enhancing reading comprehension in general, this study expands the scope by coordinating the strategy's application with the PISA literacy competency dimensions, specifically the capacity to access, interpret, evaluate, and critically reflect on text [65]-[67]. Furthermore, this study not only measures improvements in textual comprehension but also analyzes the impact of KWL on higher-order thinking skills such as analysis and evaluation, which are essential components of the PISA assessment. This approach goes beyond previous studies that are more general in nature or limited to traditional learning contexts without explicit links to global literacy standards.

The implications of this research are both theoretical and practical. Theoretically, the research results are expected to enrich the literature on the application of graphic organizers strategies especially KWL in the context of reading literacy based on international standards, as well as strengthen the relationship between active learning strategies and the development of higher-order cognitive competencies relevant to the PISA framework [68], [69]. Practically speaking, this research can offer teachers and curriculum designers operational information for creating structured and successful reading courses, especially when it comes to preparing children for complex and contextual literacy issues [70]. If the KWL approach is successful, its ramifications may promote the inclusion of comparable techniques in the national curriculum, particularly to raise the reading levels of Indonesian pupils who, according to PISA survey data, are still below the global average. The outcomes of this study can also serve as the foundation for the creation of educational policies, training programs, and instructional materials that emphasize a more strategic and results-driven approach.

This study acknowledges several limitations. First, it is likely to be conducted using a quasi-experimental design within a specific school or regional scope, so generalizing the findings to a broader population (e.g., all seventh-grade students in Indonesia) must be done cautiously, considering contextual variations such as socioeconomic backgrounds, teacher quality, and unequal access to learning resources. Second, the research focuses only on one text genre descriptive and one strategy (KWL), meaning the findings regarding its effectiveness may not be generalizable to other text genres (such as exposition or argumentation) or other metacognitive strategies. Third, although students' motivation and engagement may be observed during the intervention, they are not the primary measured variables, even though these affective factors can moderate the impact of the implemented cognitive strategy. Lastly, additional longitudinal research that goes beyond the parameters and time frame of this study is necessary to determine the KWL strategy's long-term efficacy in maintaining enhanced reading comprehension and applying skills to actual assessment scenarios like the PISA exam.

4. CONCLUSION

According to the research findings, seventh-grade students' reading comprehension of descriptive texts has improved as a result of the application of the Know-Want-Learned (KWL) strategy, which was intended in the introduction to address the problems of low engagement and learning outcomes. Qualitative changes, such as greater passion, active involvement, and students' capacity to freely organize their reading process, supported the notable improvement in test results, which went from 20% of students passing the KKM in the pre-test to 80% in the second cycle post-test. These results not only confirm that the research objectives and outcomes are in line, but they also present opportunities for future development, such as using KWL in other text genres or combining it

with digital technology for blended learning, as well as carrying out long-term experimental research to gauge the strategy's long-term effects on students' reading literacy abilities.

The KWL approach enhanced the fundamental skills for PISA reading literacy, such as intentional reading, critical questioning, and reflective evaluation, in addition to improving classroom-based comprehension outcomes. According to this study, including metacognitive techniques like KWL into regular instruction may provide educational systems looking to enhance performance on international assessments with a workable, scalable method of developing the higher-order reading abilities assessed by PISA.

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USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI)-assisted technologies were used in the preparation, analysis, or writing of this manuscript. All stages of the research process, including data collection, data analysis, interpretation of results, and manuscript preparation, were conducted entirely by the authors without the assistance of any AI-based tools.

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