

An Empirical Study on the Impact of the KWLS Teaching Model on High School Students' English Reading Proficiency

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[**Abstract**] As the reform of basic education curricula deepens, high school English reading instruction urgently needs to shift from traditional knowledge transmission to the cultivation of core competencies. Grounded in schema theory, constructivism, and metacognitive theory, this study examines the impact of the KWLS teaching model on high school students' English reading proficiency. A quasi-experimental study was conducted over four months at a high school in Wuhu City, Anhui Province, involving two parallel second-year classes; the experimental group (N = 39) received KWLS instruction, while the control group (N = 38) followed the conventional PWP approach. Data were collected through reading assessments, questionnaires, and semi-structured interviews. The findings indicate that the KWLS model significantly enhances students' decoding skills, linguistic knowledge, and reading comprehension, with particularly notable effects on spelling, reading fluency, vocabulary and grammar, and inferential understanding of details. However, no statistically significant differences were observed between groups in the dimension of cultural awareness. Interviews further confirmed that the model effectively fosters students' information extraction, critical thinking, and discourse structure analysis abilities. This research provides empirical evidence and practical insights for innovating high school English reading instruction.

[**Key words**] KWLS teaching model; English reading proficiency; core competencies; empirical research; high school students

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1 Introduction

As the core means of language input, reading occupies a pivotal position in senior high school English instruction. The “English Curriculum Standards for Senior Secondary Schools” explicitly states that English teaching should focus on cultivating students' core competencies, including linguistic competence, cultural awareness, critical thinking, and learning ability. However, current senior high school English reading instruction still commonly suffers from such issues as “emphasizing vocabulary and grammar explanation while neglecting text meaning construction” and “prioritizing outcome-based assessment over process-oriented strategy guidance”, resulting in diminished student interest in reading and weak abilities in deep comprehension. To overcome this predicament, it is particularly urgent to explore reading instruction models that can effectively stimulate students' initiative and foster deep learning.

The KWLS teaching model evolved from the KWL model, which was proposed by Ogle in 1986. The KWL model comprises three stages: K (What I Know), W (What I Want to Know), and L (What I Learned), aiming to enhance reading comprehension by activating background knowledge, setting reading goals, and reflecting on learned content. Building on this framework, Zhuang Haibin and Li Qiong (2019) offered a dual interpretation of the “S” in KWLS, distinguishing it as both “What I Still Want to Know” and “Share What I Have Learned”,

thereby expanding reading from a one-way input process into a two-way interactive cycle of continuous inquiry.

Although the KWL model has been widely adopted abroad, empirical research on its application in Chinese high school English reading instruction remains relatively limited. In particular, there is a lack of systematic data to substantiate the multidimensional impact of the KWLS model—especially when integrated with the dual dimensions of the “S” stage—on students’ reading proficiency. Accordingly, this study focuses on the following central question: What specific effects does the KWLS instructional model have on high school students’ English reading skills, including decoding ability, linguistic knowledge, reading comprehension, and cultural awareness? By conducting rigorous empirical analysis, we aim to provide a scientifically grounded basis for reforming English reading instruction at the high school level.

2 Theoretical framework

The theoretical framework of this study is primarily grounded in the following three classic theories:

Firstly, in 1980, Rumelhart proposed schema theory. This theory posits that reading comprehension is a process in which readers’ existing background knowledge (schemas) interacts with textual information. In the KWLS model, the “K” stage is specifically designed to activate students’ content schemas and formal schemas, while the “L” and “S” stages help students assimilate or accommodate new information, thereby reconstructing their cognitive schemas.

Secondly, there is constructivist theory (Piaget, 1972; Vygotsky, 1978). Constructivism emphasizes that learners are active constructors of meaning. In the KWLS model, the “W” stage encourages students to independently set reading goals, reflecting their agency in learning; meanwhile, the “S” stage—characterized by sharing and questioning—aligns with Vygotsky’s sociocultural theory, highlighting how knowledge is internalized and higher-order thinking is developed through collaboration and interaction.

Finally, there is metacognitive theory (Flavell, 1979). Metacognition refers to the awareness and regulation of one’s own cognitive processes. The KWLS model spans the entire reading process—before, during, and after—requiring students to continuously assess what they already know, what they do not yet know, and what they have learned; this essentially constitutes training in metacognitive strategies. By completing the KWLS chart, students can consciously monitor their reading progress and adjust their reading strategies, thereby enhancing their self-regulated learning skills.

3 Research methodology

This study employs a quasi-experimental research design, integrating quantitative and qualitative methods to comprehensively evaluate the effectiveness of the KWLS instructional model.

Study participants: Two parallel classes of Grade 11 students from a high school in Wuhu City, Anhui Province, were selected as the study subjects. The experimental class (EC) comprised 39 students, and the control class (CC) comprised 38 students. Prior to the experiment, both classes were taught by the same teacher, and there was no significant difference in their English proficiency levels.

Research Instruments: (1) Reading Test: Consists of pre- and post-tests, with item types covering detailed comprehension, inferential comprehension, vocabulary and grammar, and discourse analysis, for a total score of 100 points. (2) Questionnaire: Uses a 5-point Likert scale, comprising 36 items that assess four dimensions—decoding skills, linguistic knowledge, reading comprehension, and cultural awareness. Reliability was confirmed by a Cronbach’s α coefficient of 0.912, indicating good internal consistency. (3) Semi-structured Interviews: Following the experiment, four students were selected from the experimental group for in-depth interviews to provide additional insights to complement the quantitative data.

Data analysis: Independent-samples t-tests and paired-samples t-tests were conducted using SPSS 26.0, while interview data were coded and synthesized using thematic analysis.

4 Research process

The study was conducted from February to June 2026, lasting four months and divided into three phases:

Preparation Phase (February): Conduct pre-tests of reading proficiency and administer questionnaires to both classes to ensure baseline equivalence. Teachers in the experimental class receive specialized training in the KWLS instructional model, becoming familiar with the form design and classroom implementation procedures.

Implementation Phase (March to May): The experimental class fully adopts the KWLS instructional model. Before reading, students complete the “K” and “W” sections to activate prior knowledge and formulate questions; during reading, the teacher guides students to read with these questions in mind and records key information and answers in the “L” section; after reading, group discussions are conducted, and students fill out the “S” section with extended questions and learning reflections. Meanwhile, the control group continues to use the traditional PWP (Pre-reading, While-reading, Post-reading) approach, emphasizing teacher-led instruction and practice exercises.

Summary Phase (June): Conduct post-tests of reading proficiency and administer questionnaires to both classes, and carry out semi-structured interviews with students in the experimental class. Collect all data and perform statistical analysis.

5 Research and analysis

Following a 4-month experimental intervention, this study collected extensive quantitative and qualitative data. Statistical analyses of pre- and post-test scores and questionnaire responses were conducted using SPSS 26.0, with the following results.

5.1 Analysis of the impact on decoding capability

The data indicate that the KWLS instructional model has a significant effect on enhancing high school students' decoding skills. At the pretest, the experimental class had a mean score of 18.72 (SD=5.978), which did not differ significantly from the control class's mean of 18.79 (SD=6.613) ($t=-0.05$, $p=0.96>0.05$), suggesting homogeneity between the two groups at the outset. However, at the posttest, the experimental class's mean increased to 21.87 (SD=3.533), which was significantly higher than the control class's score of 19.66 (SD=5.649) ($t=2.056$, $p=0.044<0.05$). A paired-samples t -test for the experimental group revealed a highly significant difference between the pre- and posttest scores ($t=-5.768$, $p<0.001$), with the standard deviation decreasing from 5.978 in the pretest to 3.533 in the posttest, indicating that decoding proficiency within this group became more uniform and individual differences were reduced.

At the sub-dimensional level, the experimental group significantly outperformed the control group in both spelling ability (3.49 vs. 2.82, $p=0.021$) and reading fluency (11.21 vs. 9.74, $p=0.028$). However, no significant differences were observed between the groups in print concepts ($p=0.864$) or phonological awareness ($p=0.571$). These findings suggest that the KWLS model, through targeted skimming during the “W” phase and contextual review during the “L” phase, effectively enhances students' vocabulary recognition and fluent reading skills within authentic texts, while exerting only limited influence on lower-order decoding skills such as basic phonics. This result aligns with Adams' (1990) hierarchical theory of reading development: print concepts and phonological awareness are foundational skills acquired early on and become relatively fixed by the high school years, making them resistant to substantial change through short-term instructional interventions. In contrast, spelling and reading fluency—higher-order decoding skills—still have considerable room for improvement and are more susceptible to the effects of instructional strategies.

5.2 Analysis of the influence of linguistic knowledge

In the dimension of linguistic knowledge, the KWLS model demonstrates a comprehensive facilitative effect.

Post-questionnaire results indicate that the experimental class's mean total score of 15.28 was significantly higher than that of the control class (13.18; $p=0.009<0.01$). Specifically, significant differences were observed in vocabulary knowledge (EC 3.67 vs CC 3.11, $p=0.045$), grammatical knowledge (EC 3.82 vs CC 3.21, $p=0.047$), and discourse knowledge (EC 7.79 vs CC 6.87, $p=0.034$).

The post-test of the reading assessment further confirmed this finding: the experimental class's total language-knowledge score of 58.731 was significantly higher than that of the control class (51.908; $p=0.003$). Specifically, vocabulary scores (20.590 vs. 18.158; $p=0.015$) and grammar...

Both the score (10.692 vs. 9.237, $p=0.031$) and the discourse score (38.141 vs. 33.750, $p=0.004$) showed significant advantages. Notably, the largest improvement was observed in the discourse knowledge dimension (mean difference of 4.391), likely attributable to the sharing and discussion phase of the "S" stage in the KWLS model: as students explain an article's structure to their peers, they are compelled to make their implicit discourse-related cognition explicit, thereby deepening their understanding of the text's organizational logic. From a constructivist perspective, the KWLS model situates vocabulary and grammar within meaningful inquiry tasks, enabling students to achieve deep internalization of linguistic knowledge and explicit awareness of discourse structures through the process of "sharing what they have learned".

5.3 Analysis of the impact on reading comprehension

Reading comprehension is the dimension in which the KWLS model demonstrates the most significant effectiveness. In the post-test questionnaire, the experimental group's mean score of 24.38 was significantly higher than that of the control group (21.50; $p=0.004$). Among the sub-abilities, information extraction (EC: 8.10 vs. CC: 6.87; $p=0.001$) and multiple-perspective thinking (EC: 9.13 vs. CC: 7.89; $p=0.003$) showed highly significant differences, whereas strategy use (EC: 7.15 vs. CC: 6.74; $p=0.243$) did not reach statistical significance.

Post-test results similarly confirmed this: the experimental class's total reading comprehension score of 26.462 was significantly higher than that of the control class (22.868; $p=0.001$). Both detailed comprehension (9.615 vs. 8.105, $p=0.003$) and inferential comprehension (8.231 vs. 7.105, $p=0.016$) showed significant improvement. This indicates that the "W" phase of the KWLS model effectively trained students' information-locating skills; by reading with specific questions in mind, they naturally acquired skimming and scanning strategies. Meanwhile, the "S" phase—critical questioning—fostered the development of inference and divergent thinking, enabling students to move beyond surface-level information and begin considering the author's stance, the text's limitations, and the potential for multiple interpretations. However, the lack of a significant effect in the strategy-use dimension may suggest that the internalization of metacognitive strategies requires a longer time frame or more explicit instructional guidance. As Flavell (1979) noted, the development of metacognitive competence demands repeated reflective practice and externalized exercises, and a four-month experimental period may not yet have been sufficient to achieve automated transfer of these strategies.

5.4 Analysis of the influence of cultural awareness

Unlike the first three competencies, the KWLS model did not yield a statistically significant improvement in cultural awareness. In the post-test, the experimental group's mean score of 14.18 was not significantly different from that of the control group (13.32; $p=0.258$). Furthermore, no significant group differences were observed across the subdimensions of cultural knowledge ($p=0.312$), cultural understanding ($p=0.234$), cultural identity, and cultural comparison.

This result may be attributable to the following factors: First, the experimental period was relatively short—only four months—whereas the cultivation of cultural awareness is inherently long-term and implicit, making it difficult to achieve measurable progress in the short term through a single instructional approach (Byram, 1997).

Second, if the cultural dimensions of the reading materials are not explored in sufficient depth, or if cross-cultural discussions during the “S” phase lack systematic guidance, this could also account for the limited effectiveness of this dimension. Furthermore, by the high school stage, students’ cultural identities have generally stabilized, so brief reading instruction may have only a limited impact on their cultural perspectives.

5.5 Interview verification

Qualitative data provides vivid context to the quantitative findings. Student A1 stated: “KWLS helps me quickly grasp the main idea of a passage and infer the meanings of unfamiliar words from the surrounding text”, which corroborates improvements in decoding skills and reading fluency. Student A2 noted: “I can locate detailed information more rapidly and better understand the structure of a text”, reflecting progress in information extraction and discourse knowledge. Student A3 observed: “I’m faster at locating information and understanding the main idea, and my inference and critical – thinking skills have also improved”, directly aligning with a marked enhancement in multifaceted thinking abilities. Meanwhile, Student A4 pointed out: “I not only identify key information but also question its completeness and consider the author’s perspective”, precisely capturing the critical inquiry characteristic of the “S” stage.

An embodiment of the spirit of inquiry. Based on the feedback from all four students, it is evident that the KWLS model effectively facilitates a shift in reading attitudes—from “passive reception” to “active inquiry.”

6 Research conclusions

6.1 Research conclusions

This study confirms that the KWLS teaching model has a positive effect on high school students’ English reading proficiency. Specifically:

Decoding Skills and Linguistic Knowledge: The KWLS model significantly enhanced students’ spelling, reading fluency, and their knowledge of vocabulary, grammar, and discourse, demonstrating that it effectively promotes the integrated learning of linguistic form and meaning. Notably, the most substantial gains were observed in the domain of discourse knowledge, highlighting the KWLS model’s distinctive advantage in helping students construct the macrostructure of texts.

Reading Comprehension: This model demonstrates significant effectiveness in information extraction, detailed comprehension, inferential understanding, and multi-perspective thinking; however, it has yet to show a clear advantage in strategy application. These findings suggest that the KWLS model primarily enhances reading comprehension at the cognitive level, while the automation of metacognitive strategies still requires sustained, long-term training.

Cultural Awareness: Over the four-month experimental period, the KWLS model did not significantly enhance cultural awareness, suggesting that cultivating cultural competence requires a longer time frame and a more systematic cross-cultural instructional design.

6.2 Pedagogical implications

Based on the above conclusions, the following teaching recommendations are proposed:

Deepen thinking-training in the “S” phase. Teachers should thoughtfully design the “Still Want to Know” and “Share” segments, guiding students from textual analysis toward critical thinking and from single-answer responses to multiple interpretations. Formats such as “debate-style sharing” and “role-play-based sharing” can be introduced to effectively enhance students’ abilities in inference and evaluation.

Strengthen explicit instruction in reading strategies. To address the issue of insufficient strategy use, teachers should integrate specific strategy guidance—such as word guessing, skimming, and scanning—into the KWLS framework, employing a three-step approach of “modeling – practice – reflection” to help students transform implicit experience into explicit competence.

Expand the depth and breadth of cultural inquiry. During the “W” and “S” phases, teachers should deliberately introduce cross – cultural comparative topics and supplement instruction with multimodal cultural resources—such as videos, news articles, and social media texts—integrating cultural awareness development into everyday reading instruction.

Emphasize long-term practice and assessment. Given the enduring nature of cultivating competencies such as cultural awareness, schools should encourage teachers to engage in extended –action research and adopt diverse assessment approaches—such as performance – based evaluation and learning portfolios—to comprehensively evaluate student development, thereby avoiding overreliance on a single, quantitatively driven assessment model.

7 Final remarks

This study has validated the effectiveness of the KWLS teaching model in high school English reading instruction, yet certain limitations remain. First, the experimental period lasted only four months, which may not be sufficient to fully capture the model’s impact on deeper competencies such as cultural awareness; future research could adopt a longitudinal design spanning an entire academic year or longer. Second, this study was conducted solely in a high school, which served as the setting for this study, resulting in a sample with limited representativeness; future research could expand the sample size to enhance the generalizability of the findings. Moreover, subsequent studies might further examine the model’s differential effects across students with varying levels of English proficiency, as well as the moderating roles of teacher –related factors and corpus types on instructional outcomes. Despite these limitations, this study nonetheless offers valuable empirical insights for reforming English reading instruction at the high school level. The KWLS model represents not only a reconfiguration of the teaching process but also a shift in learning philosophy—transforming students from passive recipients of information into active meaning –makers and knowledge sharers. In the new era guided by core competencies, this student –centered instructional approach, which employs inquiry as its pathway and reflection as its cyclical feedback loop, warrants thorough exploration and ongoing refinement by frontline educators.

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