

Exploring the Impact of SQ4R Technique on Reading Comprehension in 10th-Grade Students

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Abstract

The study was conducted with the primary objective of investigating the effectiveness of the SQ4R technique in enhancing the reading comprehension skills of 10th-grade students. To achieve this objective, a quasi-experimental research design was chosen, involving a single group of participants. The study cohort consisted of 40 10th-grade students from a secondary school in Thailand. The instruments were an SQ4R learning management plan and a specially designed reading comprehension test. Data analysis in this study was conducted using two distinct approaches. First, the effectiveness index (E.I), calculated as the ratio of E1 (process effectiveness) to E2 (product effectiveness), was employed to gauge the overall effectiveness of the intervention. Second, a paired sample test was utilized to determine any statistically significant differences between the participants' pre-test and post-test scores. The data collection process spanned an entire semester and was conducted within a public school in Thailand during the first semester of the 2023 academic year. The results obtained from this study unequivocally demonstrate the positive and constructive impact of the SQ4R technique on the reading comprehension abilities of the participating students. These findings not only contribute valuable insights to the field of education but also emphasize the practical utility of the SQ4R model in enhancing reading comprehension, particularly within the context of 10th-grade students in Thailand.

Keywords: SQ4R, reading comprehension, Thai educational context

1. Introduction

Reading comprehension is a fundamental skill that plays a pivotal role in the academic and personal development of students (Anderson et al., 1985; Grabe, 2009; Perfetti & Adlof, 2012). The ability to understand, interpret, and extract meaning from written texts is not only an essential academic skill but also a valuable life skill with far-reaching implications. Proficient reading comprehension empowers individuals to navigate the vast sea of information in today's digital age, enabling them to make informed decisions, solve problems, and communicate effectively (Ciampa, 2012). As students progress through their educational journey, the demand for advanced reading comprehension skills becomes increasingly critical, especially as they enter the 10th grade or high school. Beyond the classroom, strong reading comprehension skills are indispensable in virtually every aspect of life, including further education, professional endeavors, and personal growth (Howard, 2011). In an era where information is a currency of its own, individuals who can engage with written materials at a deep level have a distinct advantage in their future careers, as they are better equipped to absorb, analyze, and apply knowledge across diverse fields and industries.

Moreover, the skill is particularly vital for 10th-grade students as they navigate the demanding terrain of secondary education. This skill acts as a cornerstone for their academic success, enabling them to effectively digest and internalize complex subject matter. In the core curriculum of Thailand, students are often required to read short passages and articles that delve into a myriad of subjects (The Ministry of Education, 2008). While these texts hold the potential to extend students' knowledge and experiences, they are often intentionally challenging. The complexity of such materials not only tests their grasp of subject matter but also sharpens their analytical and critical thinking

abilities. Additionally, as teenagers on the cusp of adulthood, 10th-grade students stand on the precipice of becoming lifelong learners (Manuel, 2012). The ability to comprehend and engage with diverse written materials equips them with the tools necessary to seek knowledge independently, fostering a curiosity that extends well beyond their formal education. It's important to acknowledge that this kind of text is both beneficial and challenging for both students and teachers. Enhancing reading comprehension skills in 10th-grade students not only aids in academic success but also prepares them for a future as informed, adaptable, and lifelong learners, capable of tackling the ever-evolving complexities of the modern world.

However, Thailand's educational context has grappled with significant challenges in the realm of reading comprehension (Ngampornchai & Adams, 2016; Rungswang & Kosashunhanan, 2021; Un-udom et al., 2024). Research and scholarship have uncovered alarming trends among Thai high school students. Many students struggle with a limited vocabulary, lack effective reading strategies, and find it challenging to summarize and truly comprehend the texts they encounter. These issues have reverberating consequences, particularly evident in national assessments and international benchmark tests like the PISA test. Thailand often finds itself positioned at the bottom rungs, trailing behind other countries in the same region. The inability to address these critical reading comprehension difficulties not only hampers students' academic achievements but also has broader implications for the nation's overall educational competitiveness and future workforce.

One of the primary causes of reading comprehension difficulties among Thai high school students is the lack of effective reading strategies and study methods (Ngampornchai & Adams, 2016). Many students enter their high school years without having developed structured approaches to reading and understanding complex texts. This deficiency can be attributed to a variety of factors, including limited exposure to active reading techniques and a lack of emphasis on critical reading skills in the curriculum. Consequently, students struggle to comprehend and engage with challenging texts, leading to lower academic performance and undesirable outcomes in standardized tests (Liangpanit, 2018). However, the implementation of the SQ4R technique could offer a promising solution. By systematically guiding students through the Survey, Question, Read, Reflect, Recite, and Review steps, SQ4R equips them with a structured framework to approach their reading assignments effectively. This technique empowers students to break down complex texts, extract key information, and develop a deeper understanding of the subject matter, potentially addressing the root causes of reading comprehension issues in Thailand's educational landscape.

Therefore, the current study focuses on addressing the pressing issue of reading comprehension difficulties among 10th-grade students in Thailand. Recognizing the significance of reading comprehension as a cornerstone for academic success and lifelong learning, this research aims to investigate the potential of the SQ4R technique as a solution. Through the implementation of SQ4R and a thorough evaluation of its impact, this study endeavors to offer valuable insights into enhancing students' reading comprehension abilities, ultimately enriching their educational journey and prospects for the future.

2. Literature Review

2.1 Definition of Reading Comprehension

Reading comprehension is a multifaceted process that revolves around the creation of a mental representation of the information contained within a text. In more formal terms, it's defined as the dynamic process of simultaneously extracting and constructing meaning through interaction with written language (Kintsch, 1988). To truly comprehend a text, several crucial elements come into play: the reader, the text itself, and the specific reading task, all situated within a larger sociocultural context (Snow, 2002).

Successful reading comprehension hinges on a diverse set of factors. First and foremost, the reader must possess a range of cognitive abilities, such as attention, memory, and the ability to make inferences. Additionally, motivation plays a significant role, with factors like reading goals and personal interest influencing the reader's engagement with the text. Knowledge, both in terms of domain-specific information and linguistic proficiency, also plays a crucial role in understanding written material. Importantly, all of these elements are shaped and influenced by the specific texts being read and the nature of the reading activity itself.

Given the intricate nature of reading comprehension, it is widely regarded as one of the most complex cognitive activities that humans can undertake. This complexity has made it challenging to develop a comprehensive theory that can make precise predictions applicable across a wide range of readers, texts, and discourse contexts. Consequently, researchers have proposed models that focus on specific components and processes within the realm of reading comprehension to better understand and address its complexity (Butterfuss et al., 2020; Kendeou et al.,

2016).

2.2 What Contributes to Reading Comprehension?

Scholars have long sought to elucidate the intricate processes underlying reading comprehension. Three notable models have emerged as frameworks to explore the complexities of comprehension: the Direct and Inferential Mediation (DIME) model, the Simple View of Reading (SVR), and the Reading Systems Framework.

The DIME model, developed by Kintsch (1988), emphasizes the importance of both direct and inferential processes in reading comprehension. According to this model, readers directly extract information from the text while simultaneously constructing inferences to fill gaps in their understanding. In essence, comprehension involves a dynamic interplay between these direct and inferential processes, with readers constantly adjusting their mental representations as they progress through a text.

The Simple View of Reading (Hoover & Gough, 1990) posits that reading comprehension is influenced by two fundamental components: decoding (the ability to convert written words into spoken language) and linguistic comprehension (the ability to understand language). In this model, reading comprehension is the product of the interaction between these two components. While decoding skills are essential for recognizing words, linguistic comprehension involves a broader range of language-related abilities, including vocabulary knowledge and syntactic understanding.

The Reading Systems Framework (Perfetti & Stafura, 2014) provides a comprehensive view of reading comprehension by highlighting the role of multiple, interconnected systems. It suggests that comprehension is not a unitary process but involves various components, including orthographic, phonological, and semantic systems. These systems work together to facilitate the reader's understanding of written language. The framework acknowledges the importance of individual differences in these systems and their impact on reading proficiency.

2.3 SQ4R Technique

Therefore, reading comprehension is a multifaceted process that relies on several interrelated components, including the ability to decode written language, linguistic comprehension, vocabulary knowledge, and a rich repository of world knowledge. These components need a good command of thinking skills to develop. In this case, the SQ4R technique (Survey, Question, Read, Reflect, Recite, Review) offers a structured and systematic approach to reading that can significantly enhance these essential reading comprehension components and thinking skills (Richardson et al., 2011, Rodli, 2015; Ryandani, 2017; Simbolon & Marbun, 2017). SQ4R begins with a survey (S) of the text, where the reader skims through headings, subheadings, and visual cues to gain an overview of the content. This step prepares the reader by providing a roadmap of what to expect. Readers formulate questions (Q) based on their initial survey and reading goals. These questions guide their reading, encouraging active engagement and the search for answers within the text. During this phase, readers focus on reading (R1) attentively and purposefully, seeking to answer their questions and comprehend the material deeply. SQ4R promotes active reading, ensuring that the reader remains engaged throughout the process. After reading a section, SQ4R encourages readers to pause and reflect (R2) on what they've learned. Summarizing the main points and considering how they relate to the initial questions aids in comprehension. The recitation step (R3) involves summarizing the key ideas and information in one's own words. This reinforces understanding and retention of the material. Finally, the review step (R4) involves revisiting the material, going over notes and summaries, and reflecting on the entire reading experience. This step solidifies comprehension and supports long-term retention. SQ4R serves as a valuable tool for improving reading comprehension. By encouraging active engagement, systematic questioning, and structured reflection, it equips readers with the skills necessary to decode complex texts, comprehend content at a deeper level, and think critically about the material. Furthermore, SQ4R enhances the reader's ability to connect new information with existing knowledge, fostering a more profound understanding of the text. In essence, SQ4R empowers readers to approach reading as an active and thoughtful process, ultimately enhancing their reading comprehension capabilities and promoting lifelong learning.

2.4 Previous Studies

Scholars (e.g., Iksan, 2018; Jelita, 2018; Alzu'bi, 2020; Khusniyah, Rasyid, and Lustyantje, 2020; Mohamed Sayed Mohamed, 2020; Ginting et al., 2021; Murdani, 2021; Mahastu et al., 2022; Moon and Kwan, 2022) have extensively documented the advantages of employing the SQ4R technique to enhance students' reading comprehension. Previous research underscores the technique's effectiveness in fostering active engagement, promoting systematic questioning, and facilitating structured reflection (Khusniyah, Rasyid, & Lustyantje, 2020). SQ4R equips readers with the essential skills needed to decode intricate texts (Iksan, 2018), delve into content at a deeper level, and engage in

critical thinking (Mahastu et al., 2022). Additionally, SQ4R is known to enhance a reader's capacity to connect newfound knowledge with pre-existing understandings, thus nurturing a more profound comprehension of the text. Nevertheless, limited attention has been given to the application of SQ4R within the context of Thai education. While previous studies have explored the utility of SQ4R for improving reading comprehension, there exists a gap in knowledge regarding the potential impact of various adaptations and modifications of SQ4R tailored to specific learner profiles and subject matter in the Thai educational setting. To address this gap and contribute to the existing body of research, this study has developed a comprehensive learning management plan utilizing the SQ4R technique, thoughtfully considering the unique needs of Thai grade 10 students. The primary objective of this study is to assess the effectiveness of the SQ4R technique in enhancing the reading comprehension skills of Thai grade 10 students.

3. Methodology

3.1 Research Design

The primary objective of this study is to comprehensively examine the impact of the SQ4R technique on the reading comprehension abilities of 10th-grade students. To achieve these goals, the study was meticulously designed using a one-group pre-and-post-test research design. This study endeavors to contribute valuable insights into the practicality and impact of the SQ4R technique within the educational context of grade 10 students. It seeks to provide a comprehensive understanding of how this method influences reading comprehension and how students perceive its utility, thereby informing future pedagogical practices and strategies.

3.2 Participants

The study comprised a cohort of 40 10th-grade students attending a public school in Thailand. This school is a representative district school, a common type that constitutes a significant portion of secondary education institutions in Thailand. The selection of participants was conducted using a cluster random sampling method. Notably, the chosen school adheres to the Thailand Core Curriculum of 2008, which places an emphasis on the expectation that 10th-grade students should possess the ability to comprehend articles and short passages effectively. Consequently, this school can be viewed as emblematic of the broader educational landscape in Thailand, where similar challenges related to reading comprehension are encountered on a widespread basis. It is paramount to mention that the participants in this study were treated with the utmost consideration for ethical principles governing human research, ensuring the safeguarding of their rights and well-being throughout the research process.

3.3 Instruments

3.3.1 Learning Management Plan of SQ4R

The principal tool employed in this study was a Learning Management Plan centered around the SQ4R technique. The development of this plan meticulously took into account both the foundational principles of the SQ4R technique (Richardson et al., 2011, Rodli, 2015; Ryandani, 2017; Simbolon & Marbun, 2017) and the specific requirements for enhancing reading comprehension within the context of Thailand (Ngampornchai & Adams, 2016; Rungswang & Kosashunhanan, 2021; Thongwichit, 2018), as elucidated in prior research within the field. The main activities within the SQ4R technique encompass a systematic approach to reading comprehension development. During the "Survey" phase, students engaged in skimming through the assigned text, such as a historical article on ancient civilizations, focusing on headings, subheadings, and captions to gain an initial sense of the content. In the "Question" step, they generated thought-provoking questions based on the survey, directing their attention toward key points and unfamiliar terms, fostering active inquiry. As they progressed to the "Read" phase, students read the article attentively, actively marking significant passages and taking notes, thus enhancing their understanding. Following each section, the "Reflect" step prompted students to summarize their newfound knowledge, often sharing insights with peers to solidify comprehension. In the "Recite" phase, students confidently recited key points, either individually or in groups, reinforcing memory and comprehension. Lastly, during the "Review" stage, students revisited the entire article and their notes, employing tools like concept maps to visually represent relationships between historical events and concepts. These activities exemplify how students actively participated in the SQ4R technique, demonstrating their commitment to enhancing reading comprehension through structured and engaging learning experiences. As the technique was implemented to design a learning management plan, it has 6 sub-lesson plans taking 12 class hours. The plan was evaluated by experts and scholars (5 in total) and found to be at an appropriate level of quality ($\bar{x} = 4.28$).

3.3.2 Reading Comprehension Test

The purpose of the test was to evaluate participants' reading comprehension levels both before and after the

implementation of the SQ4R learning management plan, which served as the treatment. The test comprised 30 multiple-choice question items, each with item objective congruence (IOC) values falling within the range of 0.5 to 1.0. The test items exhibited a varying level of difficulty, ranging from 0.20 to 0.97, while discrimination values spanned from 0.21 to 0.53. Test reliability, assessed through the Cronbach's alpha coefficient, was found to be 0.71, ensuring the internal consistency of the test items.

3.3.3 Data Collection and Data analysis

The data for this study were collected through the implementation of a one-group pre-and-posttest design, a research approach that allows for the assessment of changes in participant performance before and after an intervention or treatment. In this study, the data collection took place during the first semester of the academic year 2023.

To determine the effectiveness of the learning management plan, the results were evaluated using two key indicators: process effectiveness and product effectiveness. Process effectiveness was assessed by calculating the percentage of participants' average scores while engaging in activities within each sub-lesson plan (E1). Product effectiveness (E2) was determined by analyzing the scores obtained in the posttest administered after the completion of the learning plan. The participants' scores in both aspects were compared to the predetermining criteria of 80.

The Effectiveness Index (E.I.) was computed by summing the posttest scores and dividing this sum by the product of the maximum attainable score for the entire class and the sum of the pretest scores. Essentially, it quantified the relationship between posttest performance and initial proficiency.

Additionally, to identify any significant differences between participants' pretest and posttest scores, a paired samples t-test was conducted, offering valuable insights into the impact of the learning management plan on their reading comprehension abilities. This comprehensive approach to data collection and analysis allows for a thorough examination of the plan's effectiveness and its impact on the participants' reading comprehension skills.

4. Result

4.1 Effectiveness of the Learning Management Plan

Table 1. Effectiveness of the SQ4R Learning Management Plan (E1/E2)

Effectiveness	Maximum score	sum	\bar{x}	S.D.	%
Process (E_1)	60	1842	49.78	6.19	82.97
Product (E_2)	1200	1123	24.08	3.14	80.27
Effectiveness of the learning management plan ($E_1/E_2 = 82.97/80.27$)					

The study outcomes demonstrate the efficacy of the SQ4R technique in enhancing the reading comprehension of the participants. To delve into the specifics, the process effectiveness (E1) was calculated at 82.97, reflecting the participants' average score of 49.78 out of a maximum of 60 points attainable through engagement with the learning activities embedded in the SQ4R learning management plan. Concurrently, the average score achieved by students in the post-test was 24.08, constituting 80.27% of the maximum score of 30. Consequently, the overall effectiveness of the learning management plan was calculated as 82.97/81.27 ($E1/E2 = 82.97/80.27$), surpassing the established criteria of 80/80. This outcome suggests that the incorporation of the SQ4R technique as a foundational principle in the design of the learning management plan proved highly beneficial in fostering the development of students' critical reading skills.

Table 2. The Effectiveness Index of Learning Management Plan

n	Sum		Effectiveness index (E.I.)
	Pre-test	Post-test	
40	826	1123	0.7941

The results indicate that the combined sum of participants' pretest scores was 826, while the sum of post-test scores reached 1123. Taking into account the maximum achievable score on the test, which is 1200 (as shown in Table 1), the Effectiveness Index of the SQ4R learning management plan (E.I.) was calculated at 0.7941. This suggests that students augmented their knowledge by 0.7941, equivalent to an impressive increase of 79.41%.

Table 3. The Comparison between Participants' Pre and Post-Tests

Score	n	Mean	S.D.	% of Mean	df	t	Sig.
Post-test	40	24.08	3.14	80.27	36	3.05*	.00**
Pre-test	40	20.65	3.31	68.83	-	-	

*p<0.05

Furthermore, a comparison of student performance in the pre and post-tests revealed significant improvements in reading comprehension. The study's results indicated a significant difference between participants' pre-test (M = 20.65, SD = 3.31) and post-test (M = 24.08, SD = 3.14) scores, $t(39) = 3.05$, $p < 0.001$. Given the notably higher scores achieved in the post-test, it can be inferred that the learning management plan designed using the SQ4R model had a positive impact on students' reading comprehension.

5. Discussion

The results of the study indicate the benefits of the SQ4R model in reading learning within the specific context of Thailand. These findings align with previous research that has suggested the utility of the SQ4R technique in various educational contexts (e.g., Iksan, 2018; Jelita, 2018; Alzu'bi, 2020; Khusniyah, Rasyid, and Lustyantie, 2020; Mohamed Sayed Mohamed, 2020; Ginting et al., 2021; Murdani, 2021; Mahastu et al., 2022; Moon and Kwan, 2022). This discussion will delve into why the SQ4R technique proved effective in this particular study.

It should be noted that the participants in this study, similar to those in previous research, were learning reading as a foreign Language. They also went through the SQ4R process with the prompt and accommodation of teachers. The SQ4R technique encourages active engagement with the text, promoting students' involvement in the reading process. By systematically guiding students to Survey, Question, Read, Reflect, Recite, and Review the material, SQ4R facilitates a structured approach to reading comprehension. This structured engagement aids in enhancing students' ability to decode complex texts, comprehend content at a deeper level, and think critically about the material (Rodli, 2015). The act of questioning and reflecting during the reading process encourages a more profound understanding of the text, as it compels students to actively connect new information with their existing knowledge.

Moreover, the SQ4R technique is adaptable and flexible, allowing educators to tailor it to the specific needs and preferences of their students (Richardson et al., 2011). In this study, the learning management plan incorporated SQ4R principles that were thoughtfully customized to suit the Thai educational context, which emphasizes the importance of reading and understanding articles and short passages. This customization ensured that the technique was relevant and effective within the given context. Additionally, the effectiveness index (E.I.) calculated in this study, which considered both process effectiveness (E1) and product effectiveness (E2), demonstrated that students significantly improved their reading comprehension. The incorporation of effective learning activities and the structured approach of SQ4R in the learning management plan contributed to this improvement. The high E.I. indicated that students not only engaged meaningfully in the learning process but also achieved substantial gains in comprehension.

6. Conclusion

In summary, the primary finding of the current study underscores the remarkable efficacy of the SQ4R technique in augmenting reading comprehension within the unique landscape of the Thai educational context. This success can be attributed to the SQ4R model's emphasis on active engagement, structured inquiry, and its adaptability to the local educational milieu. These results serve as a compelling testament to the potential of the SQ4R model as a valuable pedagogical tool for educators striving to enhance students' reading comprehension across diverse educational settings.

The implications of this study are substantial for pedagogy. Educators can consider integrating the SQ4R model into their teaching methodologies to foster critical reading skills among students. By encouraging active involvement, strategic questioning, and aligning the approach with the specific needs of their learners, educators can effectively harness the SQ4R model to enhance reading comprehension. This approach not only promotes better comprehension but also cultivates essential thinking skills. Future research endeavors should continue to explore the applicability of the SQ4R model in various educational contexts and populations. Studies with larger and more diverse sample sizes would contribute to a more comprehensive understanding of the technique's potential impact. Additionally, incorporating qualitative approaches to delve into students' experiences and perceptions of using the SQ4R model could provide valuable insights into its effectiveness and acceptability. Additionally, policymakers in the realm of

education should take note of these findings. There is a pressing need to prioritize pedagogical methods that bolster critical thinking skills, such as the SQ4R model, within the curriculum. Emphasizing the integration of such techniques can empower students with essential tools for comprehending and critically engaging with diverse texts, ultimately preparing them for success in their educational journey and beyond.

However, it is crucial to acknowledge the limitations of this study. The research primarily relied on quantitative data, lacking a qualitative approach that could have offered a deeper understanding of students' experiences. Additionally, the study's sample size, though valuable, was relatively small. Future research could address these limitations by incorporating qualitative methods and involving larger and more diverse participant groups, providing a more holistic perspective on the SQ4R technique's effectiveness.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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