EFL reading strategies used by high school students with different English proficiency

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ABSTRACT: This study examines EFL students' reading strategy use and explores the differences between the factors affecting the use of the reading strategies by high and low proficiency EFL learners. The participants consisted of students from a high school in Taiwan. Their reading strategy usage and the influencing factors were assessed using the Survey of Reading Strategy (SORS), think-aloud protocols, and semi-structured interviews. The findings reveal no significant disparities in problem-solving strategies and supporting reading strategies between high and low proficiency learners. However, no table differences were observed in the employment of global reading strategies. In addition, learners' vocabulary size and syntactic knowledge emerged as influential factors in the utilization of reading strategies. The results also indicate that high proficiency learners employ top-down reading strategies, while low proficiency learners rely on bottom-up reading strategies to approach their reading tasks. Detailed results of the reading strategies used by the two groups of students and factors affecting the strategy results are shown and discussed, followed by pedagogical implications. At the end, suggestions for the future research will be presented.

KEYWORDS: EFL; survey of reading strategy (SORS); reading strategy use; English proficiency; high school students

1. Introduction

Reading is recognized as a fundamental skill necessary for language acquisition as it is perceived as a method of acquiring knowledge and comprehending information. Previous research defines reading as an interactive cognitive process in which individuals actively decode written text and construct their own meanings (Goodman, 1970). For ESL/EFL learners, reading is essential because it provides access to valuable information about the language and its associated culture (Adamson, 1993). However, decoding and comprehending English reading materials can be challenging, even for native speakers, and particularly so for EFL learners. As a result, researchers have actively sought out solutions to address these difficulties. One such approach is the use of reading strategies by students to comprehend reading materials (Barnett, 1988; Carrell, 1998; Dikkatli and Kürüm, 2023; Zare and Nooreen, 2011). EFL learners who exhibit proficiency in processing reading texts are observed to effectively employ reading strategies (Zare and Nooreen, 2011). Reading strategies are associated with the success of reading comprehension (Anastasiou and Griva, 2009; Anderson, 1991; Barnett, 1988; Chen and Intaraprasert, 2014; Sheorey and Mokhtari, 2001). In fact, effective readers display a higher level of awareness regarding

their use of reading strategies compared to less effective readers (Hong-Nam and Page, 2014; Kletzien, 1991; Mokhtari and Reichard, 2002). For example, Kletzien's study reported that high school students with advanced reading skills use more reading strategies than those with poor reading skills. Hsu (2004) also discovered that high proficiency junior high school students in Taiwan employ reading strategies more frequently than low proficiency students; in addition, high proficiency students tend to use reading strategies flexibly to comprehend an article.

Some studies have mainly focused on investigating students' reading strategy use and shown different strategy uses between high and low proficiency learners (Akkakoson, 2013; Chen and Chen, 2015; Hong-Nam and Page, 2014; Hsu, 2004; Kletzien, 1991; Mokhtari and Reichard, 2002), and some emphasized the effect of the use of reading strategies on learners reading comprehension (Okkinga et al., 2018). The underlying factors affecting reading strategy use between high and low proficiency learners are still ambiguous (Koda, 2007; Yang, 2002). These factors hold significant importance for instructors during reading courses. Understanding the reasons behind students' choice of strategies can aid in the effective training of reading strategies to benefit students across all proficiency levels. Therefore, the objective of this study is to examine the reading strategy use of students and explore the factors that influence the utilization of these strategies among high and low proficiency EFL learners.

2. Literature review

2.1. The definition of reading strategy use

Reading strategies have been defined and conceptualized in various ways. Barnett (1988) proposed that reading strategies encompass the mental operations employed by readers to effectively engage with the text and derive meaning from it. Carrell (1998) emphasized that reading strategies not only reveal how readers interact with written text but also highlight their role in achieving effective comprehension. Abbott (2006) viewed reading strategies as comprehension processes that readers deliberately choose and apply to make sense of what they read. Afflerbach and Cho (2009) further emphasized that reading strategies serve as mental tools used by readers to monitor, repair, or enhance comprehension.

In order to achieve effective reading comprehension, it is essential to integrate and employ a range of strategies and skills (Fitrisia et al., 2015). These include monitoring comprehension, retelling, utilizing text structures, verbalizing thoughts, posing inquiries, establishing connections, summarizing, synthesizing information, making inferences, drawing upon prior knowledge, making predictions, and employing mental imagery. (Beşkardeşler and Kocaman, 2016; Mohseni et al., 2020).

Taking into account the definitions mention above, reading strategies can be seen as tactics used during the reading comprehension process to help readers comprehensively extract information from the text. By employing these strategies, readers are expected to enhance their understanding and engagement with the material.

2.2. Research on EFL reading strategy use

Research on second/foreign language reading has confirmed the significance of reading strategy use in enhancing students' reading comprehension (Pressley et al., 1998). Moreover, some research has further identified background knowledge, language proficiency level, and strategy choices as main variables affecting reading process (Upton and Lee-Thompson, 2001). Specifically, the use of reading strategies is often regarded as relevant to learners' reading proficiency.

Some researchers (Chen and Chen, 2015; Li, 2010; Nurazila et al., 2011) have investigated the use

of L2 reading strategies among learners. To measure ESL college students' perceived use of reading strategies while reading academic materials, Nurazila et al. (2011) found that their participants mainly used problem-solving strategies to deal with reading texts. As for middle school students' use of English reading strategies, Li (2010) found that middle school EFL students often employed problem-solving reading strategies while reading, followed by global reading strategies and support reading strategies. Chen and Chen (2015) investigated 1259 Taiwanese high school students' usage of reading strategies and found most students had a preference for global reading strategies, followed by problem-solving strategies and support strategies.

Different reading strategy uses between high and low English reading proficiency learners have also been explored and investigated in recent decades (Angosto et al., 2013; Kletzien, 1991; Kummin and Rahman, 2010; Mokhtari and Sheorey, 2008; Poole, 2005; Wang, 2016). To explore different reading strategy uses between college students of higher and lower English reading proficiency, Poole (2005) investigated reading strategy uses of 248 university advanced ESL students from the midwest and south of the United States. The results showed that problem-solving strategies were used with high frequency while global and support strategies were used with medium frequency. Mokhtari and Sheorey (2002) found that skilled readers were characterized as globally aware. These skilled readers tended to think about the reading process, to draw on planning, monitoring, goal-setting and assessment strategies, and to foster global skills as well as reading comprehension. Kummin and Rahman (2010) reported that ESL university students from Kebangsaan, Malaysia who were proficient in English often used a variety of strategies. In contrast, students with lower English proficiency exhibited the limited knowledge of strategy use. Specifically, these less proficient learners struggled to utilize appropriate strategies to evaluate their own reading comprehension or performance.

As for middle school students' use of English reading strategies, Kletzien's (1991) study also reported that students with advanced reading skills know how to use effective strategies to facilitate their reading. However, poor readers used limited strategies to deal with the texts. In a study conducted by Wang (2016), 10 freshmen high school students participated to investigate the disparities between more successful and less successful EFL readers in terms of their comprehension performance and reading strategy utilization. The research involved observing these students in pairs while thinking aloud during the process of reading English texts. The findings indicated that more successful readers demonstrated effective utilization of reading strategies, conscious monitoring of their reading process, continuous integration and synthesis of textual.

According to the studies mentioned above, EFL/ESL learners, college students, and middle school students chose certain reading strategies to deal with reading an L2 text, yet learners of different language proficiency were found to employ different reading strategies to decipher the reading texts. These studies indicated that more successful learners flexibly made use of various reading strategies to deal with reading comprehension texts while less successful ones adopted limited reading strategies. It appears that different reading comprehension results were obtained due to different reading strategies used by learners of different language proficiency levels. For instance, high proficiency level students exhibited a global awareness of employing strategies like planning, monitoring, and goal setting. However, there have been yet other factors identified as affecting reading strategy use (Goh and Foong, 1997; Hoang, 2016; Kletzien, 1991; Kummin and Rahman, 2010; Mokhtari and Sheorey, 2008; Poole, 2005; Upton and Lee-Thompson, 2001; Wang, 2016; Yang, 2002), which raises the questions, "Is language proficiency level a major factor affecting learners' reading strategy use?".

It seems that there are different reading strategy uses between high- and low-level language learners.

High achievers adopt varied and effective strategies to deal with English reading comprehension whereas low achievers use limited reading strategies. Considering the difference in performance of strategy use, Rubin (1987) proposed to identify the strategies often used by high achievers and to introduce these strategies to low achievers. In addition, teachers were advised to train the low achievers to use the strategies identified from high achievers' use and to explore which work best for them. By doing so, low achievers were expected to learn L2 language more effectively.

Based on this, a growing number of studies (O'Malley, 1987; Oxford, 1994; Rasekh and Ranjbary, 2003; Shakoor et al., 2019; Song, 1998; Thompson and Rubin, 1993) on the effects of language learning training have been conducted and have found positive effects, increased strategy use does indeed improve students' language learning. To investigate the effect of strategy training on students' reading ability in an ongoing EFL college reading classroom situation, Song (1998) replicated the reading strategy training approach of Palinscar and Brown (1984) and found that Korean EFL college students' overall reading comprehension ability significantly improved after training. Furthermore, lower achievers benefited more from the training than higher achievers. The results of the study supported the educational value of strategy training and suggested that foreign language reading pedagogy should include implicit and explicit teaching. According to the study conducted by Rasekh and Ranjbary (2003), participants in the experimental group who received explicit metacognitive strategy training demonstrated superior performance compared to those in the control group. The training encompassed various elements such as assisting students in planning their own learning, setting specific goals within a defined timeframe, monitoring strategy utilization, and evaluating their learning process. The training, according to Rasekh and Ranjbary (2003), had a positive impact on the lexical knowledge development of the experimental group.

Collectively, after reviewing all previous works on L2 reading strategies, high proficiency level learners employ a range of reading strategies to tackle reading comprehension tasks, while low proficiency level learners exhibit limited knowledge of using reading strategies. Among the high proficiency level learners, problem-solving strategies and global strategies are utilized more frequently compared to their low proficiency level counterparts. To support students with limited knowledge of reading strategies in comprehending an article, reading strategy training has been found to be effective in enhancing their reading abilities (O'Malley, 1987; Oxford, 1994; Rasekh and Ranjbary, 2003; Shakoor et al., 2019; Song, 1998; Thompson and Rubin, 1993). Although most studies show that reading strategy training had positive effect on low proficiency level students, few studies explored the reading strategy use differences between high and low proficiency level students. The purpose of the study is to investigate the differences in students' use of reading strategy between high and low proficiency levels. Additionally, the study aims to delve into the factors that affect the students' use of learning strategies.

3. Method

3.1. The study

This study aims to explore the reading strategies use differences and their underlying reasons of high and low English proficiency learners. The Survey of Reading Strategy (SORS) by Mokhtari and Sheorey (2002), and assessment measures of students' reading comprehension were used. In addition to using the SORS questionnaire, this study adopted mixed-method research approach by incorporating think-aloud protocols, and interviews to obtain complete and reliable results. The findings are expected to reveal a difference in reading strategy use between high and low proficiency learners of English as well as the factor that led to the discrepancies in their reading strategy use.

3.2. Context

In Taiwan, English is a required foreign language course. Since elementary school, students have received English education with at least one of their textbooks each semester being issued by Ministry of Education. In these textbooks, reading articles have been the main focus of the instruction with prediction questions in the beginning the reading and reading comprehension questions at the end of the reading. As learners advance through the educational stages from elementary school to junior and senior high, the level of the reading materials in the textbooks increases in difficulty, including the length of reading articles, and the vocabulary size used in the articles.

When students are in junior high school, they are expected to equip themselves with a 1000-word vocabulary of the most common words so as to pass the Basic Competence Test (BCT) before graduating to senior high school. The results of the test will decide which senior high school they will enter. The BCT evaluates students' achievement in each school subject. The English section comprising multiple choice questions intends to evaluate students' vocabulary, grammar, and reading comprehension. Once students enter senior high school, they are expected to develop a vocabulary of 4500–7000 words so as to prepare themselves with the ability to take college entrance examinations. All Year 3 senior high students have to pass an English examination testing their vocabulary, reading comprehension, translation, and composition to enter university.

3.3. Participants

This study was conducted with participants randomly chosen from one Year 2 class of a high school in central Taiwan. It was a commercial high school with a substantial number of female students but a limited number of male students. In this chosen class, there were 31 participants with 7 boys and 24 girls. They were aged from 15 to 17. All of them had been learning English for at least 10 years. Their English proficiency ranged from low-intermediate to high-intermediate level. Their vocabulary size ranged from below 1000 words up to 4500 words. They had five English classes a week and each class lasted 50 min.

3.4. Data collection and instruments

A range of procedures consisting of the Test of English for International Communication (TOEIC) reading test, the SORS, think-aloud protocols, and interviews were adopted to collect data. These data resources were used to provide rich descriptions of students' reading strategy use and the factors affecting their reading strategy choices.

Immediately after their 1st midterm in the second semester in 2021, all the students in this class were invited to take a mock TOEIC reading test. The TOEIC is an "English language test" designed to measure people's everyday English skills, especially those working in an international environment. The TOEIC listening and reading comprise two equally graded tests of comprehension assessment activities totaling a possible 990 score. In the current study, the reading part of a TOEIC simulation test was employed to identify who were the high and low proficiency readers in this class. The results of the test served as a reference for this study; those in the top 30% were labeled high proficiency English readers whereas those in the bottom 30% were labeled low proficiency English readers.

Once categorized into proficiency groups, 14 students (2 males and 5 females in each level group) were then singled out to fill out a questionnaire (see Appendix A), adopted and adapted from the SORS by Mokhtari and Sheorey (2002), which is intended to measure adolescent and adult English as L2 learners' metacognitive awareness and perceived use of reading strategies while reading academic or school related

materials. The instrument consists of 30 items, each of which uses a 5-point Likert scale ranging from 1 ("1 never or almost never do this") to 5 ("I always or almost always do this"). It measures three broad categories of reading strategies: Global Reading Strategies (GLOB) with 9 items, Problem Solving Strategies (PROB) with 5 items, and Support Strategies (SUP) with 6 items.

Then, four students selected at random, one male and one female from the lower-level group and one male and one female from the higher one, were chosen to do think-aloud individually, each lasting 15–20 min. These four participants were asked to say whatever came to mind in the process of completing the task. In addition, whatever they were looking at, thinking, doing, and feeling were also included in the recording of the think-aloud protocol. Making thought processes as explicit as possible during task performance is believed to provide researchers insight into the participant's cognitive processes. According to previous research, orienting the participants prior to performing the think-aloud protocol is considered an important step for retrieving quality verbal reports (Cohen, 2011). Before collecting data, each participant was given a brief explanation and two short warm-up practices. First, they were told to use their cell phone and pretended to make a call to one of their friends while verbalizing their thoughts and behavior. Then, participants were asked to read a short passage and answer some questions related to the passage with the think-aloud method. During the practice, the researcher would remind the participants to keep talking whenever they stopped verbalizing. After the practices, participants were asked to read a passage adopted from English Textbook Book 5 Unit 1, which is a published textbook reviewed by the National Institute of Compilation and Translation (Che, 2020). They then answered some reading comprehension questions using the think-aloud method. All the think-aloud sessions were audiotaped and later transcribed verbatim.

Semi-structured follow-up interviews were then administered around one week after this reading test and the completion of decoding the thinking-aloud data. The purposes of the interviews were as follows. First, the researcher could elicit more information about reading strategy use, specifically the use of those strategies shown to have significant differences in the SORS between high- and low-level English learners. As well, the researcher could further clarify any ambiguous speech that occurred in the process of thinking aloud. The interview guide in Appendix B was used as a prompt to assist participants in reflecting on their reading strategy use while dealing with reading passage. Each interview lasted from 15–20 min.

3.5. Data analysis

The current study is based on mixed-method research. Data were collected from SORS, think-aloud responses to a reading passage, and in-depth interviews. Descriptive statistics (frequencies, means, and standard deviations) were calculated to describe and compare reading strategy use between L2 English readers of high and low proficiency.

In order to triangulate the quantitative data and to explore more factors affecting learners' reading strategy use, think-aloud, and semi-structured interviews were conducted in the participants' native language, Mandarin Chinese, and then transcribed and translated into English. Each mention of the use of a reading strategy was coded based on those reading strategies presented in Mokhtari and Sheorey (2002). In their taxonomy, reading strategies were classified into three subscales: (A) Global Reading Strategies; (B) Problem Solving Strategies; and (C) Support Strategies. A brief description of each SORS category and the number of items within each category are given below:

● Global Reading Strategies (GLOB) are those intentional, carefully planned techniques by which learners monitor or manage their reading, such as having a purpose in mind, previewing the text as to its length and organization, or using typographical aids, tables, and figures, (13 items).

● Problem Solving Strategies (PROB) are the actions and procedures that readers use while working directly with the text. These are localized, focused techniques used when problems develop in understanding textual information; examples include adjusting one's speed of reading when material becomes difficult or easy, guessing the meaning of unknown words, and rereading the text to improve comprehension, (8 items).

● Support Strategies (SUP) are basic support mechanisms intended to aid the reader in comprehending the text such as using a dictionary, taking notes, underlining, or highlighting lexical information, (9 items).

After the think-aloud protocol and interview reports were coded and analyzed in detail, the comparison between high and low in terms of their reading strategy use was then conducted to supplement the quantitative data and to elicit factors influencing learners' reading strategy use.

4. Results and discussion

4.1. Overview of reading strategy use by high and low proficiency learners

Results for each subscale of the SORS (GLOB, PROB, and SUP) are presented in the order of their frequency of use for high versus low proficiency learners in **Table 1**, **Table 2**, and **Table 3**.

Table 1. Frequency and rank of global strategies used by high and low proficiency learners.

Reading strategy use by high proficiency learners (10 students)			Reading strategy use by low proficiency learners (10 students)		
Strategy item	Mean score	SD	Strategy item	Mean score	SD
G4	4.14	0.69	G17	3.29	0.95
G1	4	1	G24	3.29	0.42
G17	4	0.82	G23	3.149	0.34
G20	4	0.82	G3	2.86	1.07
G24	4	0.22	G15	2.86	0.90
G23	3.86	0.26	G1	2.86	0.69
G15	3.71	0.76	G4	2.71	0.76
G27	3.71	0.76	G27	2.71	0.49
G3	3.57	0.98	G8	2.57	0.98
G8	3.42	0.98	G12	2.57	1.13
G12	3.42	0.98	G6	2.43	0.98
G6	3.2857	1.11270	G21	2.4286	0.36886
G21	2.7143	0.28571	G20	2.2857	1.25357

Note. The strategy items can be found on the SORS in Appendix A.

Table 1 shows that high proficiency learners reported using 9 strategies at a high level of frequency and 4 at a moderate level of frequency from within the global subscale. There were no global reading strategies employed at a low frequency by high proficiency learners. However, low proficiency learners reported using 12 global strategies at a moderate level of frequency and 1 strategy at a low level of frequency.

The most frequently used reading strategy by high proficiency learners was strategy item 4, "I take an overall view of the text to see what it is about before reading it." Compared to high proficiency learners, low proficiency ones most frequently used strategy item 17, "I use context clues to help me better understand what I am reading." These results shed some light on different reading strategy use between

high and low proficiency learners.

As for the least used reading strategy, low level learners used strategy item 20 least of all, "I use typographical features like bold face and italics to identify key information", revealing that these learners need to build up an awareness of these intentional, carefully planned techniques.

The think-aloud protocol revealed that high proficiency learners, like Betty and Gary, would skim the whole paragraph first to see what it was about before reading it carefully. However, low proficiency learners, like Jane and Woody, would translate each word into Chinese from the very beginning. When they encountered lots of unfamiliar words, they would first try to skip these words. Then they would attempt to find clues from the context to decode the meaning of the words.

....he has been working in Florida (wrong pronunciation) as a waiter in a buffet restaurant for three weeks performing duties the (that) include refilling trays and cleaning tables. Tā zài nàlǐ yǒu yīgè gōngzuò zài [...he has a job there in] Florida (wrong pronunciation) dāng waiter [as a waiter] Zài yīgè zìzhù cāntīng [in a cafeteria] sān gè yuè [for three months] performing duties xiān tiàoguò [skip for now] include refilling trays wǒ bù huì [I don't know] and cleaning tables zhěnglǐ zhuōmiàn [cleaning tables]. (Jane, LS, Excerpt 3)

Interestingly, though low proficiency learners reported high frequency use of strategy item 17, none of the low-level participants in the think-aloud activity successfully employed the strategy to get at the meaning of unfamiliar words. In the end, these unfamiliar words prevented them from reading forward.

Ránhòu…uh shénme [After…uh what] It goes without saying that before Eric and Pamela set off on their journeys shenme [What?] Eric and Pamela shénme guāngguāng kè shénme lǚchéng shénme bùyòng shuōhuà shénme de zé tiàoguò zhè piān tài zhǎng lei wǒ yǒudiǎn kàn bù tài xiàqù ei [some tourist, some journey, something they can't talk about, tsk skip, this article is too long. I can't go on.]. (Woody, LS, Excerpt 4)

Table 2. Frequency and rank of problem-solving strategies used by high and low proficiency learners.

Reading strategy use by high proficiency learners (10 students)			Reading strategy use by low proficiency learners (10 students)		
Strategy item	Mean score	SD	Strategy item	Mean score	SD
14	4.29	0.76	11	3.71	0.76
9	4.14	0.90	9	3.43	0.98
11	3.86	1.21	14	3.29	0.76
28	3.86	0.90	16	3.29	0.76
16	3.71	0.76	25	3.29	0.76
25	3.71	1.11	28	3.29	1.11
7	3.43	1.27	7	2.86	0.69
19	3.43	0.79	19	2.43	1.40

Table 2 shows that high proficiency learners reported using 6 reading strategies at a high-frequency level and 2 at a moderate-frequency level from within the subscale of problem-solving strategies whereas low proficiency learners reported moderate use of all of the reading strategies within this category.

The most frequently used reading strategy by high proficiency learners was strategy item 14, "When text becomes difficult, I pay closer attention to what I am reading." In comparison, the most frequently used strategy by low level learners was Strategy Item 11, "I adjust my reading speed according to what I am reading", which was also frequently used by high level learners. Accordingly, both high and low proficiency learners know that adjusting reading speed is an important strategy in reading an article.

While using the think-aloud protocol, Betty, a high proficiency learner, paid close attention to what she was reading, especially when the text became difficult. For example, while she was reading that a girl worked at three other jobs in Australia, she slowed her pace for some important clues related to the main

point of the paragraph and, also, for the unfamiliar words mingled into the text.

Table 3. Frequency and rank of the support strategies used by high and low proficiency learners.

Reading strategy use by high proficiency learners (10 students)			Reading strategy use by low proficiency learners (10 students)		
Strategy item	Mean score	SD	Strategy item	Mean score	SD
10	4	1	10	3.43	0.79
26	3.71	0.76	2	3.14	0.69
2	3.57	0.98	13	3.14	1.07
13	3.43	1.13	22	3.14	0.69
22	3.43	0.53	26	2.71	1.11
18	3.29	0.76	18	2.57	1.27
30	3.14	0.90	29	2.43	1.13
29	2.71	0.49	30	2.43	0.98
5	1.71	0.49	5	1.71	0.76

Table 3 shows that high proficiency learners reported the use of 3 reading strategies at high-frequency, 5 at a moderate-frequency, and 1 at low-frequency from within the category of support strategy. As for low proficiency learners, they made moderate use of most of the support strategies, except strategy item 5, "When text becomes difficult, I read aloud to help me understand what I read", which was the least used strategy by both groups of learners. strategy item 10, "I underline or circle information in the text to help me understand what I read", on the other hand, was reported to be frequently used by both high and low proficiency learners. However, through the use of the think-aloud protocol, we found that two of the high proficiency learners, Gary and Betty, underlined or circled some information related to specific details of the text about work and travel programs as well as some unfamiliar words, but low proficiency learners, like Woody and Jane, did not employ this strategy while engaged in the think-aloud reading.

In a semi-structured interview, when Gary, a high proficiency learner, was asked if he would read out loud to help him understand what he was reading when the text was difficult, he replied that he did not think he would do this. He further explained that reading out loud would be strange and weird especially if he were taking a quiz in class. As for Woody, a low proficiency learner, when asked why he would not read aloud in private if the text became difficult, his response was that it could not possibly help him know the meaning of words which, he thought, would be critical in helping him fully understand the main point of the text.

4.2. Differences in reading strategy use by different proficiency levels

As **Table 4** indicates, four reading strategies stood out as being significantly different in their frequency of use between high and low proficiency learners. The results also revealed that strategy items differing most significantly in their frequency of use by the two groups belong to the category of global strategies. Among them, strategy item 4 was used significantly more often by high proficiency learners than low proficiency ones ($t = 3.69$; $p < 0.01$).

As shown in **Table 5**, global reading strategies were revealed to be used at a significantly lower rate by low proficiency learners than by high proficiency learners. That is, high proficiency learners were more aware their reading process due to monitoring and managing their reading by using such strategies as having a purpose in mind, previewing the text as to its length and organization, or using typographical aids, tables, and figures. During the think-aloud process, for example, Gary and Betty, high proficiency learners, would circle or underline bold faced or italic words or phrases so as to help them better understand the words or passages.

Table 4. The significant differences in reading strategy use between high and low English proficiency learners.

Type	Strategy	Proficiency level	N	Mean	SD	*t*-test
GLOB	1. I have a purpose in mind when I read.	High	7	4.00	1	2.49*
		Low	7	2.86	0.69	
GLOB	4. I take an overall view of the text to see what it is about before reading it.	High	7	4.14	0.69	3.69**
		Low	7	2.71	0.76	
PROB	14. When text becomes difficult, I pay closer attention to what I am reading.	High	7	4.29	0.76	2.48*
		Low	7	3.29	0.76	
GLOB	20. I use typographical features like bold face and italics to identify key information.	High	7	4.00	0.82	3.03*
		Low	7	2.29	1.25	
GLOB	27. I check to see if my guesses about the text are right or wrong.	High	7	3.71	0.76	2.941*
		Low	7	2.71	0.49	

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 5. The significant differences in reading strategy subscales between high and low proficiency learners.

Reading strategies subscale	Group	N	Mean	SD	*t*-test
Global reading strategies	High proficiency	7	3.58	0.56	2.80*
Items 1, 3, 4, 6, 8, 12, 15, 17, 20, 21, 23, 24, and 27	Low proficiency	7	2.77	0.66	
	Total	14	–	–	
Problem solving strategies	High proficiency	7	3.80	0.80	1.54
Items 7, 9, 11, 14, 16, 19, 25, and 28	Low proficiency	7	3.20	0.67	
	Total	14	–	–	
Support reading strategies	High proficiency	7	3.22	0.44	1.56
Items 2, 5, 10, 13, 18, 22, 26, 29, and 30	Low proficiency	7	2.75	0.67	
	Total	14	–	–	

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

4.3. Factors affecting EFL learners' reading strategy use

During the semi-structured interview, these four participants, 2 representing the high proficiency level and 2 for the low proficiency level, were asked what made reading difficult while they were reading the article prepared by the researchers. All four participants considered vocabulary to be their biggest problem while they were reading. Though they encountered unknown vocabulary in the midst of reading, high proficiency readers were able to employ context clues to grasp the meaning of the words. Gary, a high proficiency learner, further said that he would check to see if the words were critical to the comprehension of the text as a whole and from that decide whether to skip the words or not. As for low proficiency learners, though they knew the concept of finding clues from context, they would initially skip over the words and let them go in the end.

In addition, Woody, one of low proficiency readers, said that unfamiliar sentence patterns and grammatical difficulties prevent him from reading smoothly. All he could do was to skip the sentences that he could not understand. Sometimes he would come to know the meanings of these sentences after reading the whole passage, but oftentimes he could not figure out what the reading was about. If the passage were too long, he would feel like giving up, for there were too many unfamiliar words and sentence patterns.

Through employing the think-aloud protocol, we saw low proficiency learners spending lots of time recognizing words, and attempting to translate word-by-word and line-by-line, yet they could not derive meaning from the text, which, in turn, arrested their willingness to read on. Also, the think-aloud process revealed that it was students' poor vocabulary and syntax knowledge which led to the difference in the performance of their reading strategy use.

Previous studies show that readers' language proficiency is related to how effectively they use reading

strategies (Cai and Kunnan, 2020; Hong-Nam and Leavell, 2006; Shen, 2003; Wharton, 2000; Yang, 2002). Readers who are highly proficient tend to use global strategies to understand a text (Kletzien, 1991; Zhang and Wu, 2009), but readers who have a low level of proficiency try to make use of some techniques that are not particularly beneficial to the understanding of the text (Gan et al., 2004). As a result, with such deficits in their language proficiency as vocabulary knowledge and grammar knowledge, some readers are unable to employ the strategies effectively while reading.

5. Conclusion

This study employed mixed-method research to examine reading strategies used by 14 high and low proficiency learners from a class of high school students in Taiwan and to explore factors affecting their reading strategy use. The current study concludes that there were no significant differences in problem solving strategies and supporting reading strategies between high and low proficiency learners. However, significantly differences were found in the use of global reading strategies. Also, the results revealed that high proficiency learners are more aware of their reading process than are low proficiency learners, which was in agreement with the findings (Cai and Kunnan, 2020; Hong-Nam and Leavell, 2006; Kletzien, 1991; Shen, 2003; Wharton, 2000; Yang, 2002; Zhang and Wu, 2009). They intentionally and carefully plan, monitor, and manage their reading. In addition, they know how to cope with the problems they encounter while reading so that they can grasp the main idea of the text. They try to get the big picture first by skimming the whole passage before going back to read it carefully. This means that their comprehension begins with the more global aspects and they subsequently go on to decipher smaller linguistic units. The meaning of these smaller units can be discovered more easily when keeping the global context in mind. Thus, it is shown that these high proficiency learners are relying more on a top-down approach to deal with the passage.

In contrast, low proficiency learners tend to start with the smallest linguistic units of a text, and then easily get bogged down by the volume of unknown vocabulary and complicated sentence patterns. As Koda (2007) found, this lack of top-down processing is a critical factor leading to unsuccessful reading comprehension. The limited language competency of these learners hampers them from using the reading strategies effectively.

6. Pedagogical implication

The aforementioned points hold several pedagogical implications. First, based on the findings, a disparity in the use of global reading strategies emerged between high and low proficiency learners during reading. Specifically, high proficiency learners demonstrated a purposeful approach, actively engaging their minds with the text. They began by gaining an overall understanding of the content before delving into the details, skillfully utilizing typographical features like boldface and italics to identify key information, and diligently verifying the accuracy of their assumptions about the text. High proficiency learners displayed adeptness in employing monitoring strategies to effectively manage their reading process. In addition, they possess superior command of vocabulary and syntactic structure, which distinguishes them from their low-proficiency counterparts. Consequently, high proficiency learners demonstrate effective comprehension of texts.

Additionally, although there is no significant difference in the use of problem-solving strategies and support reading strategies between high and low proficiency learners, their reading performances varied notably. The think-aloud protocol shed light on the fact that the low proficiency learners encountered challenges in employing these strategies effectively due to an abundance of unfamiliar words, phrases,

and complex sentence structures. Despite their awareness of the need to use these strategies, these linguistic obstacles hindered their successful implementation.

Accordingly, language instructors are encouraged to provide support to low proficiency learners. This support is suggested to encompass building essential linguistic knowledge, including enlarging their vocabulary size, and ensuring familiarity with various sentence structures and text structure, including cause and effect, comparing and contrast, sequencing. In addition, considering the influential factors, small vocabulary size and limited knowledge of sentence structure, which impact the utilization of reading strategies among low proficiency learners, EFL teachers are encouraged to adapt their teaching approaches in a way to build up these students' metacognitive strategies. By making these adjustments, instructors may assist low proficiency learners in monitoring, and evaluating their own reading comprehension skills (Gilakjani and Sabouri, 2016) during the reading process. Moreover, it is recommended that instructors explicitly teach learners how to employ reading comprehension strategies appropriately and effectively, enabling them to successfully comprehend texts (Brown, 2017; Grabe, 2009; Yapp et al., 2021).

Although the current study is a case study with an uneven distribution of participants in terms of gender, it provides insights into the use of reading strategies among high and low proficiency learners. The mixed-method research design, encompassing the use of SORS, think-aloud protocol, and semi-structured interviews, offers a comprehensive perspective. The current study examines reading strategy use between high and low proficiency level students with small numbers of participants. For future research, it is advised to expand the sample to include the entire school population or multiple schools among different areas, a more comprehensive examination of the reading strategies employed by learners in their reading tasks may be achieved.

Author contributions

Conceptualization, RRT and SCH; methodology, RRT; software, RRT; validation, RRT and SCH; formal analysis, RRT and SCH; investigation, RRT; resources, RRT; data curation, RRT and SCH; writing—original draft preparation, RRT and SCH; writing—review and editing, RRT and SCH; visualization, RRT and SCH; supervision, SCH; project administration, RRT; funding acquisition, RRT and SCH. All authors have read and agreed to the published version of the manuscript.

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Conflict of interest

We have no known conflict of interest to disclose.

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Appendix A

Reading strategies survey

The purpose of this survey is to collect information about various techniques you used while reading of academic materials in English.

All the following statements are based on the academic materials you have read in school such as textbooks, non-newspapers or magazines. Each statement is followed by a number from one to five, representing the following meanings:

"1" means "I never or almost never do this";

"2" means "I do this occasionally";

"3" means "I do this sometimes" (about 50% of the time);

"4" means "I usually do this";

"5" means "I always or almost always do this".

After reading each item, circle the number that applies to you. Note there are no right or wrong options regarding the statements of this survey. Please answer the following questions as accurately and honestly as possible. Your responses will be kept confidential and will only be used for research purposes.

Statement		Never	Occasionally	Sometimes	Usually	Always
1	I have a purpose in mind when I read.	1	2	3	4	5
2	I take notes while reading to help me understand what I read.					
3	I think about what I know to help me understand what I read.					
4	I take an overall view of the text to see what it is about before reading it.					
5	When text becomes difficult, I read aloud to help me understand what I read.					
6	I think about whether the content of the text fits my reading purpose.					
7	I read slowly and carefully to make sure I understand what I am reading.					
8	I review the text first by noting its characteristics like length and organization.					
9	I try to get back on track when I lose concentration.					
10	I underline or circle information in the text to help me remember it.					
11	I adjust my reading speed according to what I am reading.					
12	When reading, I decide what to read closely and what to ignore.					
13	I use reference materials (e.g., a dictionary) to help me understand what I read.					
14	When text becomes difficult, I pay closer attention to what I am reading.					
15	I use tables, figures, and pictures in text to increase my understanding.					
16	I stop from time to time and think about what I am reading.					
17	I use context clues to help me better understand what I am reading.					
18	I paraphrase (restate ideas in my own words) to better understand what I read.					
19	I try to picture or visualize information to help remember what I read.					

Table A1. (*Continued*.)

20	I use typographical features like bold face and italics to identify key information.
21	I critically analyze and evaluate the information presented in the text.
22	I go back and forth in the text to find relationships among ideas in it.
23	I check my understanding when I come across new information.
24	I try to guess what the content of the text is about when I read.
25	When text becomes difficult, I re-read it to increase my understanding.
26	I ask myself questions I like to have answered in the text.
27	I check to see if my guesses about the text are right or wrong
28	When I read, I guess the meaning of unknown words or phrases.
29	When reading, I translate from English into my native language.
30	When reading, I think about information in both English and my mother tongue.

Appendix B

Interview guide

1) What difficulties did you encounter while reading this article?
2) How did you deal with those unfamiliar words while reading?
3) How did you figure out the meaning of a sentence with a lot of unfamiliar words while reading?
4) Does the length of the article make it difficult for you to read? How will you solve it if you encounter the scenario?