Investigating the Metacognitive Online Reading Strategies Among ESL Undergraduates

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Abstract
This study is done to investigate the use of metacognitive online reading strategies among ESL Malaysian undergraduate students. It is aimed to answer three research questions: i) What global strategies do students use when reading texts in English? ii) What problem solving strategies do students use to overcome reading difficulties when reading texts in English? iii) What support strategies do students use to overcome reading difficulties when reading text in English? Using a quantitative approach, a set of questionnaires has been adapted from Amer et al. (2010) and distributed to 44 undergraduate students from a publica university in Malaysia. The instrument which consists of four sections was statistically analysed and clearly revealed the favoured online reading strategies for each type of the strategies namely global strategies, problem-solving strategies and support strategies among students. The pedagogical implication of this study would suggest all reading strategies should be taught and extensively used in ESL reading class to motivate and enhance students' comprehension in online reading.
Keywords: Metacognitive, Online Reading Strategies, English As Second Language

1.0   INTRODUCTION
1.1   Background of Study
Reading is one of the key language skills that English as a Second Language (ESL) learners must acquire in order to succeed in global learning contexts. The process of reading is inherently interactive, requiring active engagement from students to construct meaning. In various scenarios, students must employ reading strategies to overcome comprehension challenges to foster a deeper understanding of the reading text. The purpose of academic reading transcends surface-level comprehension as it involves the meticulous analysis, synthesis and application of metacognitive thinking. This process is necessary to make connections between the author's message and pre-existing knowledge and concepts (Abeelah and Al-Sobh,2021).

Within the university context, students must actively read English textbooks and articles in both printed and digital formats to foster a comprehensive understanding and preparing them for academic and professional challenges. Nevertheless, higher education students are yet to master the skill to digest large amounts of academic text in a fast, efficient and effective manner. According to Lee and Spartley (2010), academic writings are frequently written in a succinct and compact way, necessitating a significant level of reading comprehension skills from even proficient readers in order to infer and understand their content.

Online reading has grown in importance as a primary source of input for L2 readers as a result of rising globalisation and the World Wide Web. While it has become common and even required, readers or learners are not always successfully or efficiently interacting with digital texts. This is due to the nature of online reading that offers a vast volume of information and is presented in a nonlinear manner (Chen and Chuang, 2019). There are three online reading strategies that are commonly used by ESL learners that aid their reading comprehension namely global strategies, problem-solving strategies and support strategies (Sheorey and Mokhtari, 2001).

The integration of online learning platforms in Malaysian institutions has increased due to the growth of digital education, especially in the wake of the worldwide COVID-19 epidemic. Hence, researching metacognitive techniques especially in relation to online reading is important since it is consistent with the changing educational landscape. Metacognitive reading strategies entail higher-order cognitive functions including monitoring comprehension, self-evaluation, and strategy adaptation in response to knowledge. Language learning and academic success can be enhanced by identifying the strategies that work best for ESL students in an online setting. Complex academic writings might be difficult for ESL undergraduates to understand. By investigating metacognitive methods, educators may get knowledge on how to provide students the tools they need to handle difficult reading materials effectively, which will enhance their academic achievement.

1.2 Statement of Problem

The global pandemic has caused a shift from traditional face-to-face classroom learning to online learning. This transition has presented challenges for educators and students as they struggled to adapt this new method of learning. One significant impact of this adjustment is observed in their reading skills (Pokhrel and Chhetri, 2021; Li, 2022) as there is lack of direct interaction between teachers and students on the online mode of education. This has impacted their reading comprehension and engagement (Selvaraj et.al, 2021). Another challenge in online reading that has mostly been discussed is the students's ability to read online, as reading online texts is not similar to reading traditional printed texts (Harputra, Ramadhani and Siregar, 2023). Reading online is more challenging than reading printed text due to students are prone to losing their reading focus by switching from one source to another at one time (Harputra, Ramadhani and Siregar, 2023). This has resulted in weak reading comprehension.

In the context of our ESL Malaysian undergraduate students, reading skills has been integrated in English language learning since early education to higher academic levels. In order to incorporate reading skills, academic reading texts are used to provide new information for academic purposes. However, it is unclear how aware these students are of the reading strategies they should employ when reading an academic text. Furthermore, very few studies have been conducted regarding this matter to our Malaysian students. In fact, it

is very important to determine the level of metacognitive reading awareness among students, whether they possess high, moderate, or low, as well as their preferred reading strategies (Harputra, Ramadhani and Siregar, 2023). Researchers have explored the differences between offline and online reading strategies, highlighting the need for metacognitive online reading strategies to support effective reading (Selvaraj et al., 2021). The previous researchers also promoting metacognition starts with building students' awareness to facilitate their reading comprehension (Mokhtari et al., 2018). Based on this fact, it would be valuable for the educators to investigate the metacognitive reading strategies that the students use in their academic reading especially when they read online. Thus, this current study should be carried out to raise awareness of reading strategies on ESL Malaysian students to enhance their reading comprehension.

1.3 Objective of the Study and Research Questions

This study is done to investigate ESL learners' metacognitive online reading strategies. This present study seeks out to answer the following research questions;
1. What global strategies do students use when reading texts in English?
2. What problem solving strategies do students use to overcome reading difficulties when reading texts in English?
3. What support strategies do students use to overcome reading difficulties when reading text in English?

2.0 LITERATURE REVIEW
2.1 Strategies Used for Reading
This paper relies on existing studies on themes mainly on metacognitive awareness and online reading.
2.1.1 Metacognitive awareness
Sheorey and Mokhtari (2001) stated that metacognitive awareness of reading strategies is significantly correlated to second or foreign language proficiency. When learners are aware of the different cognitive and metacognitive strategies they can use, they can select the most appropriate strategies for them to understand and construct meaning from texts they are reading. Sheorey and Mokhtari (2001) developed an instrument called Survey of Reading Strategy (SORS) and classified metacognitive reading strategies into three categories: *Global*, *Problem-solving* and *Support strategies*. *Global strategies* are intentional and carefully planned by learners to observe their reading, such as having a purpose in mind, previewing the text, checking how the text content fits its purpose, noting text characteristics like length and organization, and predicting or guessing the meaning of the text. *Problem-solving strategies* are the actions that readers enroll while reading the text, especially when the text becomes difficult including guessing the meaning of unfamiliar words, adjusting their own reading rate, visualising the information they read, resolving conflict information, and rereading the text to improve comprehension. *Support strategies* are what readers use to boost comprehension, such as using a dictionary, taking notes, highlighting textual information, or translating from one's first language to the target language. Amer et al. (2010) mentioned that metacognitive strategies are purposive techniques in which language learners monitor or manage their reading such previewing the text as to its length and organization, or using typographical aids, and tables and figures. Additionally, metacognitive strategies play such an important role in language learning as these strategies supervise, organize, and involve thinking about the learning process (Marboot et al., 2020; Rianto, 2021). Generally,

the researchers believe that learners are required to have metacognitive awareness to help them obtain their reading objectives effectively.

2.1.2 Online reading

Mukhlif and Amir (2017) stated that online reading has become crucial in teaching and learning as it serves as major source of information for students and teachers. In accordance with reading online, metacognitive awareness requires individual cognitive and motivational processes in the reading process (Fatema et al., 2009; Songsiengchai, 2010; Temur and Bahar, 2011; Pammu et al., 2011). A later study by Mesgar et al. (2012) suggested that learners should be prepared with adequate online metacognitive reading strategies in order to comprehend online academic reading texts. Moreover, Taki (2015) claimed that despite many obstacles in online reading, metacognitive strategies enable learners to better understand what they are reading online especially when they choose a good strategy.

2.2 Past Studies on Reading Strategies

There are many studies have been conducted to explore various online reading strategies used by second or foreign language learners (Ahmadian and Pasand, 2017; Do and Phan, 2021; Rianto, 2022; and Harputra, Ramadhani and Siregar, 2023). One of the utmost findings on online reading strategies was studied by Ahmadian and Pasand (2017) who explored strategies used by Iranian EFL learners' online reading metacognitive strategy use and its relation to their self-efficacy in reading comprehension. This study adopted the Online Survey of Reading Strategies (OSORS) by Anderson (2003) and self-efficacy questionnaire to 63 homogeneous sophomore EFL learners. The findings showed that they utilize problem-solving online metacognitive reading methods the most, while support strategies are the least used. Another study done by Do and Phan (2021) to identify the metacognitive online reading strategies used by 123 Vietnamese students. The result from this study demonstrates high usage of problem-solving strategies, followed by medium usage of support and global reading strategies among the students in this particular country. Next, Rianto (2022) carried out a study concerning the correlation between the metacognitive online reading strategy use and the online reading comprehension of 602 Indonesian EFL students majoring in languages, social sciences, and sciences. This study found that the problem-solving strategies and support strategies were highly used, while the global strategies were used moderately. Meanwhile, Harputra, Ramadhani and Siregar (2023) found that the global reading strategies were the most popular reading strategies among 76 English Education Study Program students in one of the universities in Indonesia, followed by problem-solving strategies while support strategies were at the bottom list. The data was obtained from the OSORS by Anderson (2003). This study revealed that the students were aware of their metacognitive reading practices and this has resulted in better understanding when they read online.

Based on the above studies, it is noticeable that ESL or EFL learners use metacognitive reading strategies and practise different strategies to enhance their understanding in online reading.

2.3 Conceptual Framework

Figure 1 shows the conceptual framework of the study. This study is replicated from the study by Amer et.al (2010).
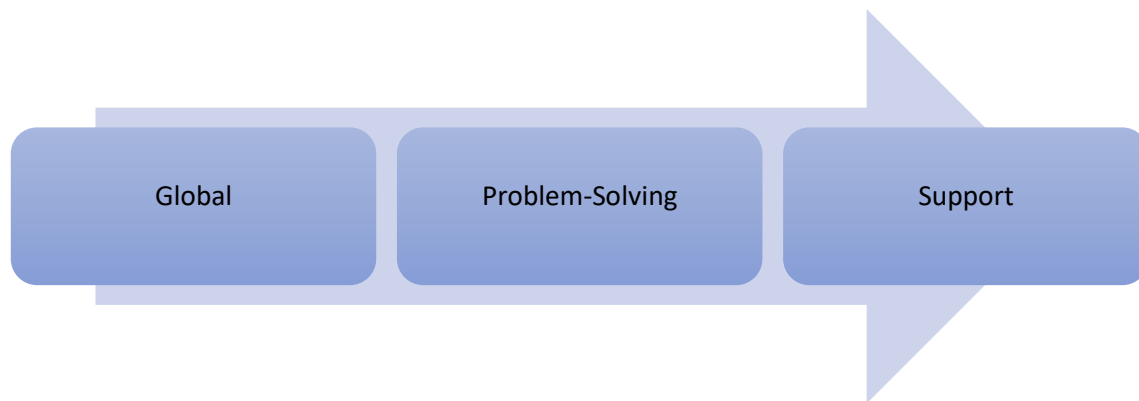
Figure 1- Conceptual Framework of the Study

Online Reading Strategies among Undergraduates

This conceptual framework originates from Amer et al. (2010) on reader's perceived use of online reading strategies and another study by Abeelah and Al Sobh (2021) on reading comprehension problems that examines the complex relationships between global strategies, problem-solving strategies, and support strategies.

In online reading, global strategies involve techniques like previewing and skimming that will enable initial understanding of online content. Problem-solving strategies, such as predicting and clarifying, help overcome comprehension challenges by actively engaging with the material. Meanwhile, support strategies leverage digital tools such as hyperlinks and multimedia that enhance comprehension by providing supplementary context. In this framework, these strategies exhibit dynamic relationships. Global strategies pave the way for effective problem-solving, as a broader context aids in identifying challenges. Problem-solving strategies often prompt the use of support tools, like hyperlinks, to bridge comprehension gaps. Support strategies, in turn, enrich global understanding through interactive features. These strategies work together to improve comprehension, demonstrating how readers skilfully combine strategies to successfully explore online information.

Studies by Alsofyani (2019) and Putri, Pammu, and Nasmilah (2023) have shown that they are effective in improving online reading comprehension and speed. In order to help students navigate reading on the internet, teachers can model these strategies through think-aloud exercises and offer specific instruction in reading comprehension techniques. These techniques help readers comprehend the text more thoroughly, get beyond reading difficulties, and retain information effectively.

Several research studies have been conducted to explore the relationship between reading strategies and reading difficulties among different populations, including ESL learners. The study by Aisha et al. (2020) found a significant relationship between reading difficulties and reading strategies among ESL learners in Malaysia. Similarly, Zhang and Li (2021) found that the use of reading comprehension strategies was positively correlated with reading comprehension among Chinese college students. Overall, these studies suggest that there is a positive relationship between reading strategies and reading difficulties. Effective reading strategies can help overcome reading difficulties and improve reading comprehension among different populations.

3.0   METHODOLOGY

This quantitative study is done to explore the use of metacognitive online reading strategies among undergraduates. A purposive sample of 44 participants responded to the survey that was distributed by class instructors via Google Form. The instrument used is a 5

Likert-scale survey and is rooted from Amer et al. (2010) on readers' perceived use of online reading strategies to reveal the variables in table 1 below. The survey has 4 sections; Section A consists of items on demographic profile, Section B consists of 17 items on global strategies, Section C has 8 items on problem-solving strategies, and section D has 9 items on support strategies.

Table 1- Distribution of Items in the Survey

SECTION	STRATEGY	NUMBER OF ITEMS
B	Global	17
C	Problem-Solving	8
D	Support	9
		34

Table 2- Reliability of Survey

Reliability Statistics

Cronbach's Alpha	N of Items
.949	34

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .949, thus, revealing a good reliability of the instrument chosen and used. Further analysis using SPSS version 28.0 is done to present findings to answer the three (3) research questions for this study.

4.0   FINDINGS
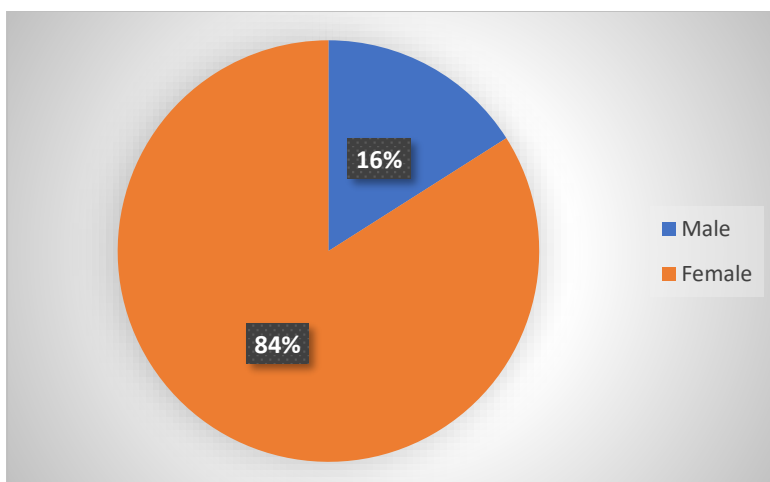   4.1   Findings for Demographic Profile
Q1.Gender

Figure 2- Percentage for Gender

A total of 44 respondents participated in the online survey. Based on Figure 2, the demographic profile of the respondents shows that 16% of the respondents are male. The female respondents constitute 84% of the total respondents.
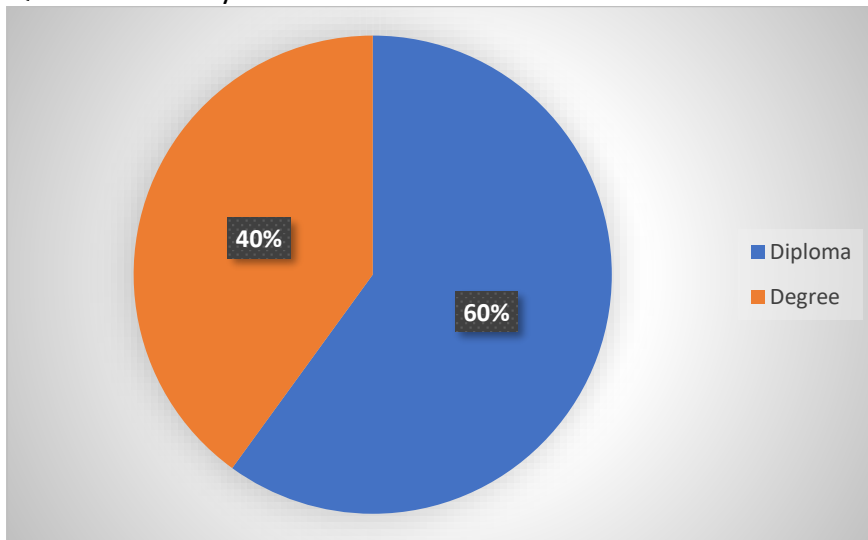
Q2 Level of Study

Figure 3- Percentage for Level of Studies

Closer analysis of the data (see Figure 3) reveals that 60% of the respondents are diploma students while 40% of the respondents are degree students.
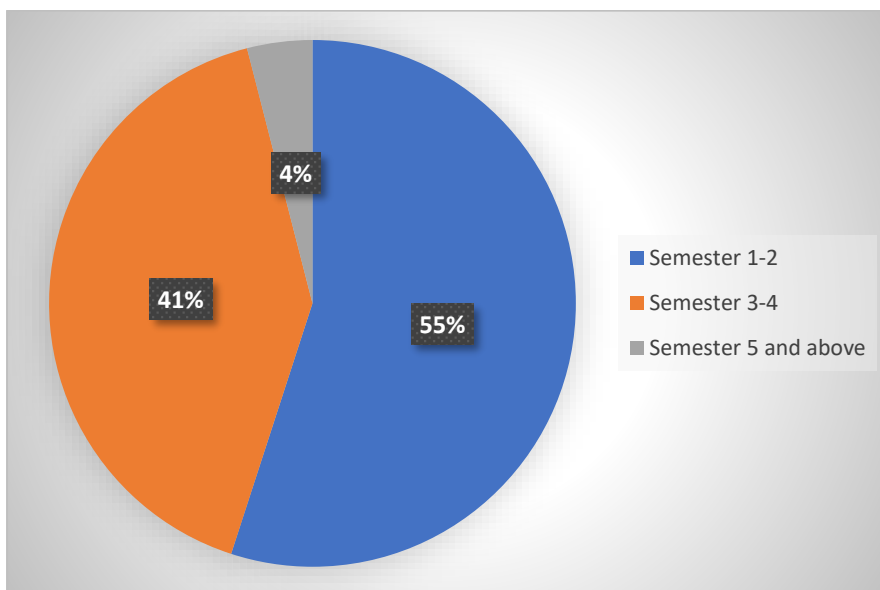
Q3.Semester

Figure 4- Semester

Regarding the semester of study, the data revealed that 55% of participants were in Semester 1-2, 41% were in Semester 3-4, and a smaller proportion, 4%, were in Semester 5 and above (see Figure 4).

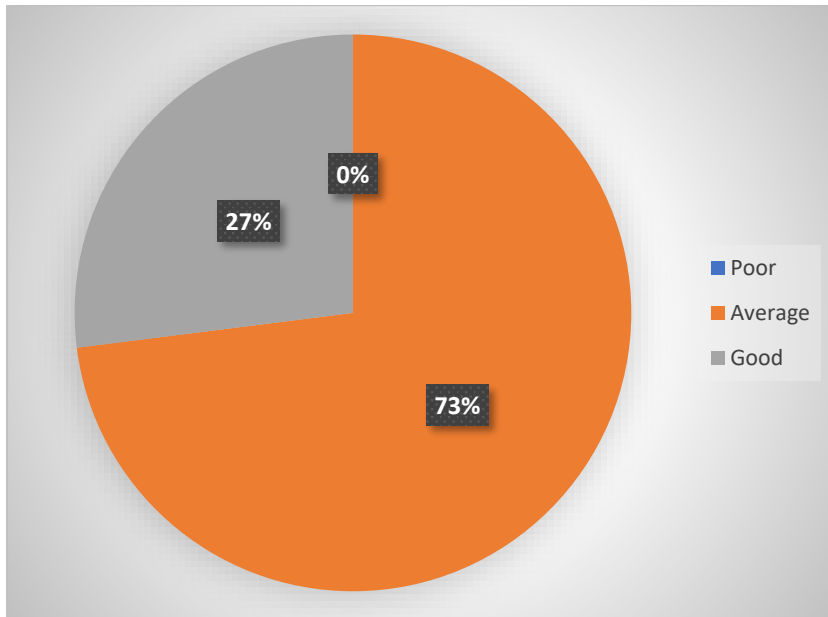Q4. Self-Rating of Reading in English Proficiency

Figure 5 - Percentage for Self-Rating of Reading in English Proficiency

When participants self-rated their English reading proficiency, 73% considered themselves to have an average level, 27% rated their proficiency as good, while no participants rated themselves as having poor proficiency (See Figure 5). These findings offer insights into the participants' gender distribution, level of study, semester, and self-perceived English reading proficiency.

        4.2   Findings for Global Reading Strategies

This section presents data to answer research question 1- How do learners use global strategies in reading?
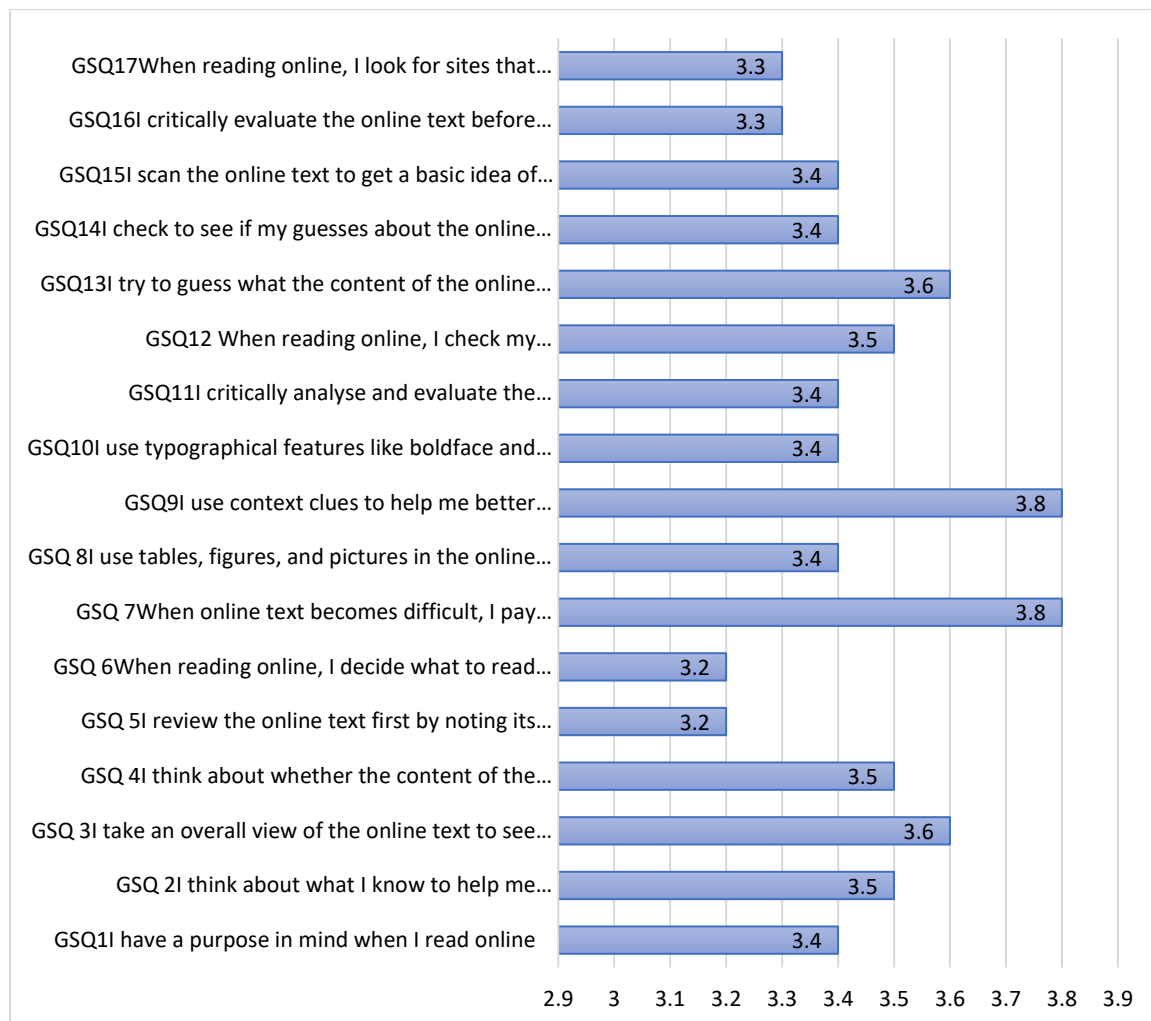
GLOBAL STRATEGIES

Figure 6- Mean for Global Strategies

Based on the data above, two of the global strategies; GSQ7 and GSQ9, recorded the highest mean score of 3.8 where the respondents stated they pay closer attention to what they are reading when the text becomes difficult (GSQ7) and also, they use context clues to help them better understand what they are reading online (GSQ9). This is followed by another two global strategies; GSQ3 and GSQ13, which also share the same mean score of 3.6. The respondents said they take an overall view of the on-line text to see what it is about before reading it (GSQ3) and try to guess what the content of the on-line text is about when I read (GSQ13). Finally, the lowest mean score of global strategy is GSQ5 and GSQ6 with the mean score of 3.2, where the respondents review the on-line text first by noting its characteristics like length and organisation (GSQ5) and decide what to read thoroughly and what to ignore when they read online (GSQ6).

4.3   Findings for Problem-Solving Reading Strategies

This section presents data to answer research question 2- How do learners use problem-solving strategies in reading?
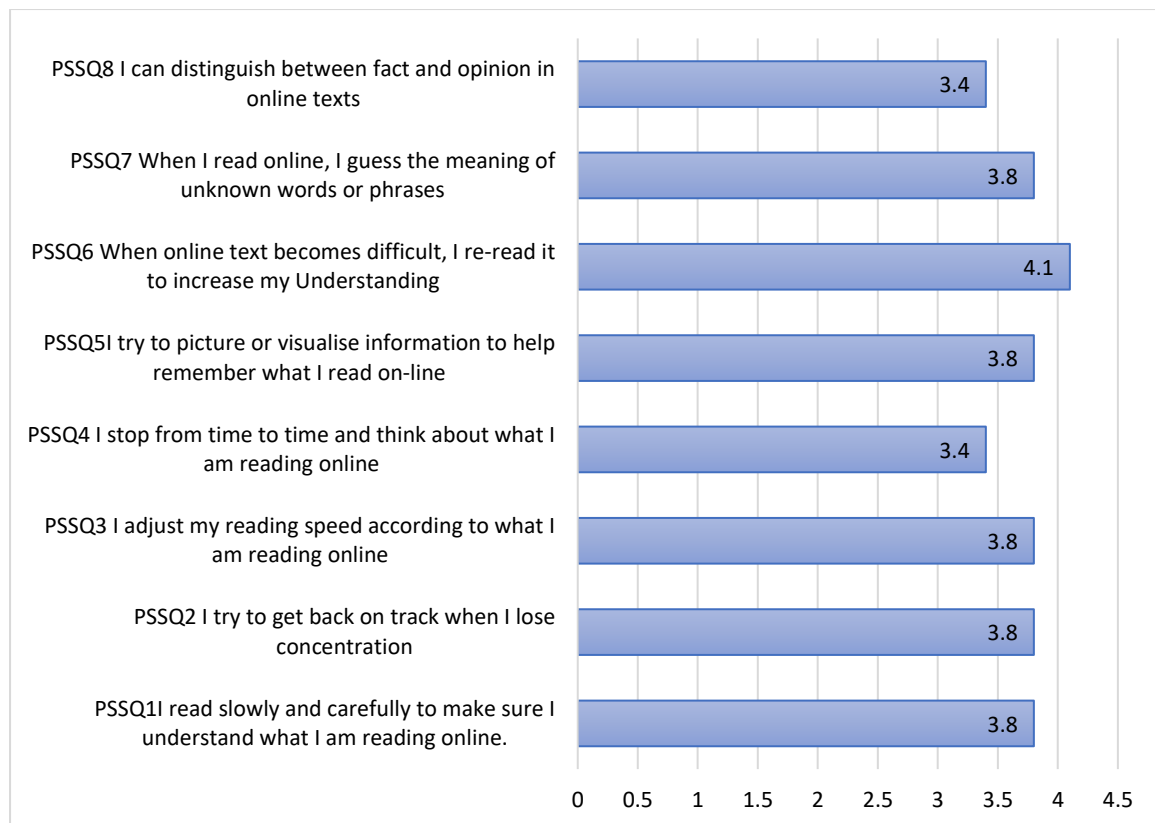
PROBLEM--SOLVING STRATEGIES

Figure 7- Mean for Problem-Solving Strategies

Figure 7 shows the most popular problem-solving strategies is PSSQ6 where the respondents re-read the text to increase understanding when online text becomes difficult. There are 5 other items share the same mean score of 3.8 (PSSQ1, PSSQ2, PSSQ3, PSSQ5, PSSQ7). Meanwhile, the least popular problem-solving strategies is PSSQ4 and PSSQ8 in which the respondents said they stop from time to time and think about what they are reading online, and they can distinguish between fact and opinion in online texts.

4.4 Findings for Support Reading Strategies
This section presents data to answer research question 3- How do learners use support strategies in reading?
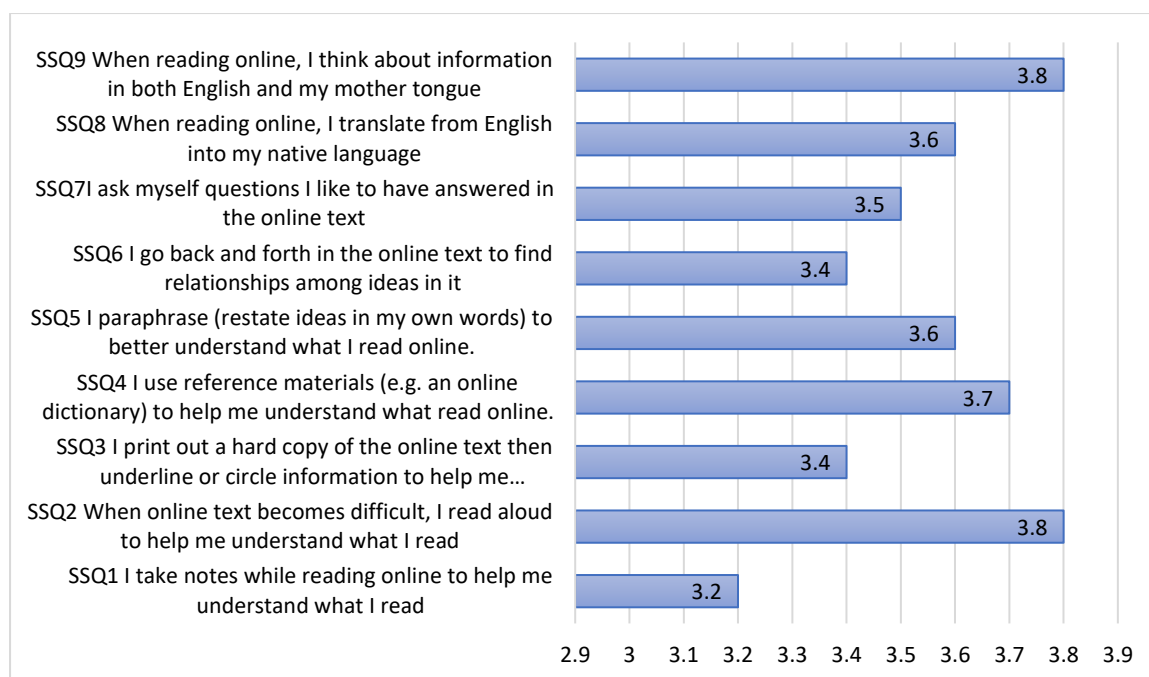SUPPORT STRATEGIES

Figure 8- Mean for Support Strategies

Based on Figure 8, of all 9 items, SSQ2 and SSQ9 demonstrates the most preferred support strategies, with the mean score of 3.8. The respondents read aloud to them understand better when the online text becomes difficult (SSQ2), and they also think about information in both English and native language when reading online (SSQ9). The least preferred support strategies is SSQ1 with the mean score 3.2 only. Here the respondents do not prefer to take notes while reading online to help their understanding. Other items; SSQ4 scored 3.7, SSSQ5 and SSQ8 both scored 3.6, SSQ7 with the mean score 3.5, while SSQ3 and SSQ6 stated mean score of 3.4, were moderately used by the respondents.

5.0 CONCLUSION
5.1 Summary of Findings and Discussions

Overall, the data analysis reveals the favoured online reading strategies for each type of the strategies namely global strategies, problem-solving strategies and support strategies among students. The discussion that follows will summarise the findings and result based on the three (3) research questions.

What global strategies do students use when reading texts in English?

According to the Online Survey on Reading Strategies (OSORS), respondents indicated that they exhibit heightened focus on their reading when encountering challenging content (GSQ7). Additionally, they employ context clues to enhance their comprehension of online text (GSQ9). This suggests that these learners are employing global reading strategies to a significant degree, to facilitate their comprehension of the online text.

This is in accordance with the mixed-method study among Iranian EFL learners by (Nilforoushan, Rashtchi, & Abbasian, 2023) which found that perceived metacognitive reading strategies differed depending on the type of text being read, with learners using more global strategies when reading academic texts. It is contrary to Jayanti's (2016) assumption that learners are bound to lose interest in what they are reading when they encounter reading difficulties.

What problem-solving strategies do students use to overcome reading difficulties when reading texts in English?

In support of the data in global reading strategies, it is also revealed that ESL learners did apply problem-solving strategies to enhance the understanding of the online text. To support this, the majority of the respondents mentioned that they re-read the text to increase understanding when online text becomes difficult (PSSQ6). In addition, they adjust their reading speed according to what they are reading online and guess the meaning of unknown words or phrases when they read online. This proves that ESL learners are active readers as they are engaged with the text in a proactive and involved manner.

This current finding is in line with research study by Kamarulzaman and Abdullah (2019) which highlights that ESL learners use problem-solving strategies such as checking comprehension, adjusting reading speed, and engaging in metacognition to enhance their understanding of the text. Additionally, learners use strategies such as summarizing, predicting, and making connections to enhance their understanding of the text.

What support strategies do students use to overcome reading difficulties when reading text in English?

Data from support strategies revealed that ESL learners read aloud to themselves to understand better when the online text becomes difficult (SSQ2), and they also think about information in both English and native language when reading online (SSQ9). However, it is discovered that learners fail to apply support strategies of note-taking strategies to aid their comprehension of the online text (SSQ1). This is similar to the finding by (Singh et al., 2023) that learners' least favoured support strategy was writing notes,or going back and forth to reflect and connect ideas within the text. This illustrates learners' inability to apply reading strategies at a higher level.

5.2 Pedagogical Implications and Suggestions for Future Research

This study has provided a picture of the online reading strategies preferred by students. Based on the identified preferred online reading strategies, language instructors can design lessons to raise students' awareness about these strategies as providing guidance on how to effectively use these strategies can empower students to navigate online texts more efficiently. The findings will also enable instructors to choose the most effective reading strategies to be incorporated into the reading class that will eventually create a dynamic and enriching ESL learning experience. Insights from the current study could serve as a foundation for instructors to design more effective and tailored instructional approaches that align with students' preferences and needs.

Referring to the findings and conclusion presented in the previous part, the researchers suggest future research to study the correlation between learners' technological literacy and their proficiency in employing online reading strategies. Evaluation can be made on how learners' familiarity with digital tools influences their ability to navigate and comprehend online content effectively.Other than that, future research could also conduct comparative studies between different age groups, proficiency levels, and educational backgrounds to identify variations in the adoption of online reading strategies. Researchers could explore whether certain strategies are more effective for specific learner demographics. It is hoped that future research can contribute to a more comprehensive understanding of how ESL learners in Malaysia navigate online texts and adapt their reading strategies to the evolving digital landscape.

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