

The Influence of Top-Down Reading on Reading Difficulties and Reading Strategies

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ABSTRACT

While reading and understanding texts, a reader experiences a complex cognitive process, which depends on prior knowledge and contextual clues to derive meaning. Though these top-down processing strategies are essential for fluent reading, many struggling readers may face challenges when applying these methods. This study explores the influence of top-down reading on reading difficulties and reading strategies. To achieve this, quantitative research design was employed with a convenience sample of 262 student participants from local matriculation institutions and universities. This study also utilizes a three-section survey based on a 5-point Likert scale. The findings revealed that the majority prefer printed materials over online texts, and participants consistently deploy active metacognitive strategies when reading online. Participants faced more word-level struggles than overall comprehension issues, with reading anxiety driven by internal frustration and social comparison rather than demographic factors or format preferences. However, readers using top-down strategies relied heavily on problem-solving and cognitive support, which also correlated with higher overall reading difficulty. Based on these findings, instructors should model top-down strategies by encouraging more problem solving activities and scaffolding techniques to aid better comprehension.

Keywords: Reading comprehension, Top-down reading, Reading difficulties, Reading strategies,

INTRODUCTION

Background of Study

Top-down reading models and cognitive reading strategies have been widely recognized as essential factors in determining tertiary students' academic literacy and reading comprehension success. Previous research indicates that applying top-down processes such as activating prior knowledge, utilizing context clues, and employing metacognitive monitoring significantly helps learners in navigating complex academic texts (Abdullah & Teo, 2024). For instance, Oliver and Young (2016) found that top-down reading training positively impacts reading fluency by encouraging readers to synthesize overarching meanings rather than becoming bogged down by micro-level language barriers.

Similarly, recent investigations into Malaysian tertiary education highlight that undergraduate readers heavily rely on top-down strategies to overcome cognitive load when reading English-language academic materials (Li et al., 2024). These findings suggest that higher-level conceptual processing enables tertiary students to engage more effectively with academic texts, helping them bridge gaps in comprehension and employ purposeful online reading strategies.

Statement of Problem

Previous research provides valuable insights to the background of the study. However, how top-down processing,

perceived reading difficulties, and strategy adoption influence one another need further analysis and understanding. While current literature highlights the general use of top-down processing, including how top-down reading directly assists specific reading difficulties, specifically in online environments, it still needs further understanding. Furthermore, empirical studies yield mixed results regarding whether top-down strategy reliance fully resolves reading issues or merely acts as a temporary coping mechanism when structural language skills are lacking. Although previous research in Malaysia has explored broad categories of online reading strategies among university undergraduates (Jusoh & Abdullah, 2020), the specific mechanism through which top-down reading influences students' perceived choice and deployment of these strategies remains open for further exploration. Therefore, a distinct research gap exists in understanding how top-down reading impacts reading difficulties and online reading strategy usage among Malaysian undergraduates, underscoring the need for further empirical investigation.

Objective of the Study and Research Questions

This study is done to explore the influence of top-down reading on reading difficulties and reading strategies. Specifically, this study is done to answer the following questions;

1. Is there any significant relationship between reading strategies across gender, education level, field of study, and reading preference?

H₀₁: There is no significant relationship between reading strategies across gender, education level, field of study, and reading preference.

2. Is there any significant relationship between reading difficulties across gender, education level, field of study, and reading preference?

H₀₂: There is no significant relationship between reading difficulties across gender, education level, field of study, and reading preference

3. How do learners perceive top-down reading?

4. How do learners perceive problem-solving reading strategies?

5. How do learners perceive support reading strategies?

6. How do learners perceive their reading difficulties?

7. Is there a significant relationship between top-down reading and reading difficulties?

H₀₃: There is no significant relationship between top-down reading and reading difficulties

8. Is there a significant relationship between top-down reading and problem-solving strategies?

H₀₄: There is no significant relationship between top-down reading and problem-solving strategies

9. Is there a significant relationship between top-down reading and support strategies?

H₀₅: There is no significant relationship between top-down reading and support strategies

LITERATURE REVIEW

Theoretical Framework of the Study

Schema Theory (Rumelhart, 1980) in Reading

David Rumelhart's Schema Theory (1980) explains that reading comprehension depends on what readers already know. Each person has mental structures, called schemas, that store their previous knowledge and experiences. According to Rumelhart, when people read, the words in a text provide clues that help them activate the relevant

schema. These schemas help readers interpret the new information with their existing knowledge, allowing them to understand the text more effectively. Therefore, this theory implies that reading is an active process in which readers construct meaning rather than simply receive information from the text. The process of constructing meaning happens when readers' relevant background knowledge act as an enabler to predict meaning, overcome difficulties, and understand the text better. However, readers who lack appropriate schemas may experience difficulties in comprehension because they have limited knowledge to support their understanding.

Cognitive Load Theory (Sweller, 1988) and Reading Difficulties

Cognitive Load Theory (CLT), developed by Sweller (1988), proposes that learning is difficult when we try to learn everything at once, as our brain can only handle limited information at a time. Learning should start by building strong schemas, such as learning simpler and abstract ideas first before moving on to complex real-world tasks. According to the theories, there are three categories of cognitive load: intrinsic load, which involves the complexity of the material; extraneous load, which arises from poor instructional design; and germane load, which refers to the resources devoted to schema construction (Sweller et al., 2019).

Reading comprehension involves several stages. To understand a text, learners have to decode words, grasp the vocabulary, work out the meaning of sentences, link the different ideas together, and understand the text as a whole. For readers who have difficulty with reading, these various tasks can overload their working memory and, as a result, impair their ability to comprehend. Usually, students devote so much energy to basic skills such as recognising and decoding words that they have less mental power left over for more advanced activities like drawing inferences, linking ideas, and thinking critically about the text (Kendeou et al., 2016). The issue is even more obvious among second language (L2) learners, since they have to deal with unfamiliar words, complicated grammar, and new cultural references when they are attempting to understand the text (Grabe & Stoller, 2020).

Cognitive Load Theory suggests that teaching methods which help students link new information to what they already know can make reading easier. By removing unnecessary challenges, these approaches let students use more of their working memory to understand the text. Top-down reading instruction, which asks readers to use their background knowledge, predict content, and infer meaning before looking at specific language features, fits well with CLT. It helps lower cognitive load and supports better reading comprehension.

Past Studies on the Relationship between Reading Difficulties and Reading Strategies

Recent studies have highlighted the important role of reading strategies in supporting learners' reading comprehension and addressing reading difficulties (Oranpattanachai, 2023; Rahman et. al, 2023). Research has shown that learners employ a variety of reading strategies when processing English texts, and these strategies are associated with improved comprehension. In particular, studies have reported that strategy use is related to learners' ability to understand texts and manage reading challenges. These findings indicate that reading strategies are an essential component of successful reading and should be incorporated into English language instruction.

The study by Oranpattanachai (2023) was conducted to investigate the relationship between reading strategies, reading self-efficacy, and reading comprehension among Thai EFL students. The respondents consisted of 31 Thai engineering students attending a TOEIC course at a public university in Thailand. The researcher used a Reading Strategy Questionnaire, a Reading Self-Efficacy Questionnaire, and a TOEIC Reading Comprehension Test to collect the data. The findings revealed a significant relationship between overall reading strategy use and reading comprehension ability. A significant relationship was also found between top-down strategies and reading comprehension, whereas no significant relationship was found between bottom-up strategies and reading comprehension. In addition, a significant relationship was reported between reading self-efficacy and reading comprehension ability. The study suggested pedagogical implications for English language teaching, particularly regarding the use of reading strategies to support reading comprehension.

Next, the study by Rahman et al. (2023) also investigated reading difficulties and online reading strategies among undergraduate students. The purpose of the study was to investigate the perceived use of online reading strategies among undergraduate students and to examine reading difficulties, global reading strategies, problem-solving

reading strategies, and support reading strategies. The study obtained responses from 232 undergraduate students. Data were collected using a 5-point Likert-scale survey based on reading difficulties adapted from Abeeleh and Al-Sobh (2021) and online reading strategies proposed by Amer et al. (2010). The findings showed that the highest mean for reading difficulties was related to students thinking that other students were better at language than they were, while problem-solving strategies recorded some of the highest mean scores among the online reading strategies. Correlation analysis further indicated an association between reading difficulties and online reading strategies. Based on these findings, the researchers concluded that the use of particular reading strategies is associated with students' learning habits of becoming independent readers, their reading purposes, and task requirements.

Overall, both studies emphasise the importance of reading strategies in English language learning. Oranpattanachai (2023) demonstrated that reading strategy use, particularly top-down strategies, is significantly related to reading comprehension, whereas Rahman et al. (2023) showed that reading difficulties are associated with the use of online reading strategies among undergraduate students. Together, these studies suggest that reading strategies play an important role in helping learners process texts more effectively. However, neither study specifically examined the influence of top-down reading on both reading difficulties and reading strategies within the same investigation. Therefore, the present study seeks to extend the existing literature by examining how top-down reading influences learners' reading difficulties and their use of reading strategies.

Conceptual Framework of the Study

Figure 1 below shows the conceptual framework of the study. This framework for “positions top-down reading as a meaning-construction process that shapes how learners experience reading difficulties and deploy reading strategies. Anchored in Schema Theory, reading comprehension is viewed as an active process in which readers draw on prior knowledge, background experience, and contextual cues to predict and interpret text meaning (Rumelhart, 1980). When readers can effectively activate relevant schemata, top-down processing reduces reliance on word-by-word decoding and supports global comprehension. However, reading difficulties emerge when cognitive demands exceed learners’ processing capacity, which is explained through Cognitive Load Theory; excessive linguistic complexity, unfamiliar content, and limited background knowledge increase intrinsic and extraneous load, leading to comprehension breakdowns (Sweller, 1988). Empirical evidence shows that such difficulties are often text-related—stemming from vocabulary density and structural complexity—and affective, particularly anxiety, which further disrupts comprehension and strategy use (Abeeleh & Al-Sobh, 2021). Within this framework, readers respond to difficulties by employing reading strategies, including problem-solving and support strategies such as inferencing, predicting, rereading, and using external aids (Amer et al., 2010). Crucially, reading difficulty is conceptualised as cyclical rather than isolated; recurring comprehension problems can negatively influence readers’ confidence, motivation, and future reading behaviour, reinforcing subsequent difficulties (Rahmat et al., 2020). Altogether, the framework explains how top-down processing, cognitive load, and strategic reading interact to shape learners’ reading experiences and long-term reading development.

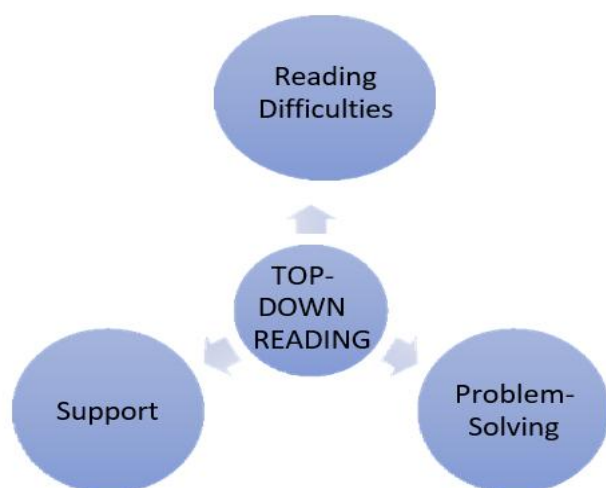


Figure 1- Conceptual Framework of the Study:

The Influence of Top-Down Reading on Reading Difficulties and Reading Strategies

METHODOLOGY

This quantitative study is done to explore the influence of top-down reading on reading difficulties and strategies. A convenient sample of 262 participants responded to the survey. The instrument used is a 5 Likert-scale survey and is rooted from Abeeleh & Al-Sobh, (2021)& (Amer,et.al.,2010) to reveal the variables in table 3 below. Table 1 below shows the categories used for the Likert scale; 1 is for Strongly Disagree, 2 is for Disagree, 3 is for Undecided, 4 is for Agree and 5 is for Strongly Agree.

Table 1- Likert Scale Use

1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

Table 2- Distribution of Items in the Survey

Section	Variable	Construct	Item/ Indicator	Total	
B	Reading Difficulties (Abeeleh & Al-Sobh, 2021)	Text-Related	8	13	.917
		Anxiety	5		
	Top-Down /Global		6		.865
C	Reading Strategies (Amer,Et.Al.,2010)	Problem-Solving	6		.871
		Support	6		.841
				31	.920

Table 2 shows the distribution of items in the survey. Reference/citation for the survey chosen. Explain in detail each section- how many items, total number of items.

Table 3- Reliability Levels, Cronbach's Alpha Ranges, and Their Interpretations

Reliability Level	Cronbach's Alpha range	Interpretation
Excellent	0.9 and above	Indicates very high internal consistency
Good	0.80-0.89	Reflects strong internal consistency
Acceptable	0.70-0.79	Indicates acceptable internal consistency
Questionable	0.60-0.69	Reflects questionable internal consistency
Poor	Below 0.6	Indicates poor internal consistency

In order to determine the internal reliability of the instrument, reliability analysis is conducted. . Table 3 above shows the distribution and interpretation of Cronbach Alpha range. According to Ahmad,et.al. (2024), Cronbach Alpha scores between 0.7 to 0.9 is considered acceptable to excellent.

Table 2 also shows the reliability of the survey. The analysis shows a Cronbach alpha of .917 for reading

difficulties, .865 for top-down, .871 for problem-solving strategies and .841 for support strategies. The overall Cronbach Alpha for all 31 items is .920; thus, revealing a good reliability of the instrument chosen/used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

FINDINGS

Demographic Analysis

According to Zienefuss, et.al (2021), researches report demographic data in percentages to establish sample representatives, and allow for generalizability to a larger population. The reporting also provides an overview of participants' characteristics. Percentages offer a clear and understandable picture of the sample makeup.

Table 4- Percentage for Demographic Profile

Question	Demographic Profile	Categories	Percentage (%)
1	Gender	Male	45%
		Female	55%
2	Education Level	Foundation/Matriculation	45%
		Diploma	45%
		Degree	10%
3	Field of Study	Science & Technology	63%
		Social Sciences, Humanities & Business	37%
4	Reading Preference	Physical Books/Magazines	62%
		Online Materials	38%

Table 4 demonstrates the data for the demographic profile of this study. Female participants made up 55% of the sample, while males accounted for 45%. The majority of these participants consists of Foundation/Matriculation and Diploma students, at 45% each. In terms of field of study, 63% of participants were from Science & Technology, while Social Sciences, Humanities & Business accounted for 37%. Regarding reading preferences, majority of participants favored physical books and magazines (62%) over online materials (38%)

Inferential Statistics

According to He (2024), there are three main functions of a T-test and ANOVA. Firstly, both are done to compare means. This test is also done to determine if the average scores (mean) or values of two groups, or one group against a known value, are different enough to be considered statistically meaningful and are not just due to random chance. Secondly, T-test and ANOVA are done to test hypotheses. Researchers use t-tests and ANOVA to test hypotheses about means, such as whether a new treatment significantly impacts a variable or if there's a difference in performance between two distinct groups. Lastly, T-test and ANOVA are done to identify significant differences. The output of a t-test provides a p-value (significance value). If this p-value is below a predetermined threshold (often 0.05), it indicates a statistically significant difference, allowing researchers to draw conclusions about the populations from which their samples were drawn. A one-way ANOVA (Analysis of Variance) is a statistical method used to compare the means of three or more independent (unrelated) groups to determine if there is a statistically significant difference between them. It is a parametric test that evaluates the effect of a single independent variable (the factor) on a dependent variable.

Findings for Significant Difference for all factors across Clusters

This section presents data to answer research question 1 : Is there any significant relationship between reading strategies across gender, education level, field of study, and reading preference?

H₀₁: There is no significant relationship between reading strategies across gender, education level, field of study,

and reading preference.

Table 5- T-Test/ANOVA for READING STRATEGIES

		MEAN	SD	T/F-Statistics <i>df</i>	p-value	OUTCOME
Gender	Male	3.46	0.69	t(260)=-1.711	0.88	H _o Accepted
	Female	3.60	0.65			
Education Level	Foundation/ Matriculation	3.60	0.81	F(2,259)= 1.179	0.309	H _o Accepted
	Diploma	3.51	0.53			
	Degree	3.38	0.53			
Field of Study	Science & Technology	3.51	0.70	t(260)=-0.820	0.413	H _o Accepted
	Social Sciences, Humanities & Business	3.58	0.63			
Reading preference	Physical Books/Magazines	3.58	0.65	t(260)= 1.224	0.222	H _o Accepted
	Online Materials	3.47	0.70			

With reference to table 5, a T-Test and one way ANOVA were conducted to examine the effects of reading strategies on gender, education level, field of study and reading preference. All interactions did not reveal a significant relationship. Hence, null hypothesis for H_{o1} is accepted.

Findings for Significant Difference for all factors across Clusters

This section presents data to answer research question 2 : Is there any significant relationship between reading difficulties across gender, education level, field of study, and reading preference?

H_{o2}: There is no significant relationship between reading difficulties across gender, education level, field of study, and reading preference.

Table 6- T-Test/ANOVA For Reading Difficulties

		MEAN	SD	TF-Statistics <i>df</i>	p-value	OUTCOME
Gender	Male	2.60	0.75	t(260)=1.224	0.445	H _o Accepted
	Female	2.67	0.70			
Education Level	Foundation/ Matriculation	2.54	0.73	F(2,259)=-.766	0.003	H _o Rejected
	Diploma	2.81	0.69			
	Degree	2.64	0.72			
Field of Study	Science & Technology	2.54	0.73	t(260)=-3.051	0.03	H _o Rejected

	Social Sciences, Humanities & Business	2.81	0.69			
Reading preference	Physical Books/Magazine s	2.68	0.71	t(260)=1.116	0.27	H ₀ Accepted
	Online Materials	2.57	0.75			

With reference to table 6, a T-Test and one way ANOVA were conducted to examine the effects of reading difficulties on gender, education level, field of study and reading preference. There were no significant relationships for reading difficulties across gender ($t=260$; $p=0.445$) and reading difficulties and reading preference ($t=260$; $p=0.27$). Nevertheless, there were significant relationships for reading difficulties and education level ($F(2,259)=-.766$; $p=0.003$) and significant relationships for reading difficulties and field of study ($t(260)=-3.051$; $p=0.03$).

Thus, null hypothesis for H₀₁ is accepted for gender and reading preference but rejected for education level and field of study.

Descriptive Statistics

Why is there a need to report the mean and standard deviation? According to Vetter (2017), Mean (M) represents the average, or centre of a data set. Standard

deviation (SD) indicates the typical distance of individual observations from the mean which shows the data's variability or spread. A low SD means the data points are clustered close to the mean while a high SD indicates they are more spread out. It is good to have a high SD.

Findings for Top-Down Reading

This section presents data to answer research question 3 : How do learners perceive top-down reading? In the context of this study, this is measured by global reading strategies.

Table 7- Mean (M) and Standard Deviation (SD) for Global Strategies

ITEM	M	SD
GSQ 1I think about whether the content of the on-line text fits my reading purpose	3.06	1.00
GSQ 2When reading on-line, I decide what to read thoroughly and what to ignore	3.32	1.01
GSQ3I use context clues to help me better understand what I am reading online	3.68	1.02
GSQ4I use typographical features like boldface and italics to identify key Inforation.	3.36	1.16
GSQ5I try to guess what the content of the on-line text is about when I read.	3.67	0.99
GSQ6 scan the on-line text to get a basic idea of whether it will serve my purposes before deciding to read it.	3.45	1.04

Table 7 shows the Mean (M) and Standard Deviation (SD) data for global strategies. Among the strategies, participants used contextual clues the most to help them comprehend what they read online ($M=3.68$, $SD=1.02$). Another significant strategy used is by scanning the online text before reading ($M=3.45$, $SD=1.04$). The least preferred global strategy used was to consider if the content of the online text aligns with their reading purpose ($M=3.06$, $SD=1.00$). Overall, though some participants favor contextual and structural cues, they consistently employ a variety of global strategies to navigate online texts.

Findings for Problem-Solving Strategies

This section presents data to answer research question 4 : How do learners perceive problem-solving reading strategies?

Table 8- Mean (M) and Standard Deviation (SD) for PROBLEM--SOLVING STRATEGIES

ITEM	M	SD
PSSQ1 I try to get back on track when I lose concentration	3.94	0.88
PSSQ2 I adjust my reading speed according to what I am reading on-line	3.78	0.96
PSSQ3 I stop from time to time and think about what I am reading on-line	3.45	0.99
PSSQ4 When on-line text becomes difficult, I re-read it to increase my understanding	4.07	0.97
PSSQ5 When I read on-line, I guess the meaning of unknown words or phrases	3.76	0.98
PSSQ6 I can distinguish between fact and opinion in online texts	3.55	0.93

Table 8 indicates the Mean (M) and Standard Deviation (SD) data for problem-solving strategies. The data shows participants have the highest usage of rereading online texts if they find them difficult to understand. (M=4.07, SD=0.97). Another significant strategy reported is the attempts to get back on track when they lose focus on reading (M=3.94, SD=0.88). The lowest score for the problem-solving strategy used is pausing while reading (M=3.45, SD=0.99). Overall, the relatively high mean scores across all items demonstrate that participants consistently rely on problem-solving strategies to navigate textual challenges and regulate their online reading process.

Findings for Support Strategies

This section presents data to answer research question 5: How do learners perceive support reading strategies?

Table 9- Mean (M) and Standard Deviation (SD) for SUPPORT STRATEGIES

ITEM	M	SD
SSQ1 I take notes while reading on-line to help me understand what I read	3.05	1.11
SSQ2 I use reference materials (e.g. an on-line dictionary) to help me understand what read on-line.	3.56	1.08
SSQ3 I paraphrase (restate ideas in my own words) to better understand what I read on-line.	3.57	1.00
SSQ4 ask myself questions I like to have answered in the on-line text	4.42	1.05
SSQ5 When reading on-line, I translate from English into my native language	3.32	1.21
SSQ6 When reading on-line, I think about information in both English and my mother tongue	3.67	1.05

Table 9 illustrates the Mean (M) and Standard Deviation (SD) data for support strategies. Participants reported using self-questioning strategy (M=4.42, SD=1.05) the most when engaging with online texts. They also processed information in both English and their mother tongue (M=3.67, SD=1.05). Conversely, the least utilized support strategy was taking notes to aid comprehension (M=3.05, SD=1.11). Overall, these results highlight that participants did more cognitive support strategies, such as self-questioning and translation, than manual physical strategies like note-taking when reading online.

Findings for Reading Difficulties

This section presents data to answer research question 6 : How do learners perceive their reading difficulties?

Table 10-Mean (M) and Standard Deviation (SD) for Text-Related (TR)

ITEM	M	SD
TRQ1I faced a problem in figuring out the meanings of some new words in the reading text	3.01	0.83

TRQ2I faced a problem in identifying the aim behind reading comprehension	2.84	0.90
TRQ3I faced difficulty in guessing the meanings of some new words	2.87	0.94
TRQ4I faced a problem in distinguishing main ideas from supporting ideas in the reading text	2.70	0.90
TRQ5I faced difficulty in extracting main and detailed ideas in the text	2.65	0.90
TRQ6I faced difficulty in recognizing the total meaning of the text	2.52	0.93
TRQ7I usually translate word by word when I am reading	2.68	1.16
TRQ18I faced difficulty in summarizing the main ideas of the text	2.56	0.91

Table 10 demonstrates the Mean (M) and Standard Deviation (SD) data for Text-Related (TR) to investigate how learners perceive their reading difficulties. The most significant challenge reported while reading is figuring out the meanings of some new words in the reading text (M=3.01, SD=0.83). Another difficulty highlighted is determining the main objective behind reading comprehension texts (M=2.84, SD=0.90). Apart from that, with the lowest score of M=2.52, SD=0.93, participants perceived difficulty in seeing the big picture of the text. Overall, these data illustrate that word-level struggles are more prominent than global understanding when it comes to reading difficulties.

Table 11- Mean (M) and Standard Deviation (SD) for Anxiety (A)

ITEM	M	SD
AQ1I feel stressed when reading a text in English in the classroom.	1.86	0.95
A20I never feel quite sure of myself when I am reading in the classroom.	2.29	1.05
AQ3I keep thinking that the other students are better at reading than I am.	3.05	1.26
AQ4 Even if I am well prepared for the class, I feel anxious about reading materials written in English.	2.45	1.20
AQ5I feel upset when I don't understand what I read in English	2.81	1.23

Table 10 shows the Mean (M) and Standard Deviation (SD) for Anxiety (A). The data reported a significant difference between items. Participants believed that other students are better readers than them (M=3.05, SD=1.26). Another significant report is that they feel frustrated when they don't understand English texts (M=2.81, SD=1.23). The feeling of uncertainty also happened when they read in classrooms (M=2.29, SD=1.05). The lowest source of anxiety reported was feeling stressed when reading a text in English in the classroom (M=1.86, SD=0.95). Overall, with these data, participants experienced the greatest anxiety from social comparison and internal frustration the most than other types of anxiety.

Exploratory Statistics (correlation)

According to He (2024), correlation is a statistical technique that shows how strongly two variables are related to each other or the degree of association between the two. It's a common tool for describing simple relationships without making a statement about cause and effect. This section presents data to answer the research question on correlation.

To determine if there is a significant association in the mean scores between Top-Down, Reading Difficulties, Problem-Solving, Support Strategies, data is analysed using SPSS for correlations. Results are presented separately in Table 12.

According to He (2024), coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0.

Table 12- Correlation between Top-Down, Reading Difficulties, Problem-Solving, Support Strategies

Correlations		TOP_DOWN	READING_DIFFICULTIES	PROBLEM_SOLVING	SUPPORT
TOP_DOWN	Pearson Correlation	1	.319**	.665**	.537**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	262	262	262	262
**. Correlation is significant at the 0.01 level (2-tailed).					

Findings for the Relationship between top-down reading and reading difficulties

This section presents data to answer research question 7: Is there a significant relationship between top-down reading and reading difficulties?

H₀₃: There is no significant relationship between top-down reading and reading difficulties. Table 12 shows that there is an association between top-down reading and reading difficulties. Correlation analysis shows that there is a moderately significant association between top-down reading and reading difficulties ($r=.319^{**}$) and ($p=<.001$). This means that there is also a moderate positive relationship between top-down reading and reading difficulties.

Findings for the Relationship between top-down reading and problem-solving strategies

This section presents data to answer research question 8: Is there a significant relationship between top-down reading and problem-solving strategies?

H₀₄: There is no significant relationship between top-down reading and problem-solving strategies. Table 12 shows that there is an association between top-down reading and problem-solving strategies. Correlation analysis shows that there is a strong, significant association between top-down reading and problem-solving strategies ($r=.665^{**}$) and ($p=<.001$). This means that there is also a strong positive relationship between top-down reading and problem-solving strategies.

Findings for the Relationship between top-down reading and support strategies

This section presents data to answer research question 9: Is there a significant relationship between top-down reading and support strategies?

H₀₅: There is no significant relationship between top-down reading and support strategies. Table 12 shows that there is an association between top-down reading and support strategies. Correlation analysis shows that there is a strong, significant association between top-down reading and support strategies ($r=.537^{**}$) and ($p=<.001$). This means that there is also a strong positive relationship between top-down reading and support strategies.

CONCLUSION

Summary of Findings and Discussions

Despite a majority preference for physical print materials over online media, participants consistently deploy active metacognitive strategies when reading online. Specifically, readers frequently rely on global strategies, problem-solving techniques to navigate textual challenges, and cognitive support methods (such as self-questioning and translation) over physical ones like note-taking. Regarding reading difficulties, participants encounter word-level struggles more often than global comprehension issues, with reading anxiety stemming

primarily from social comparison and internal frustration. Inferential analysis reveals no significant relationship between reading strategies or difficulties and demographic factors (gender, education level, field of study) or format preference. However, correlation analysis demonstrates key relationships between strategies and challenges: higher engagement in top-down reading is strongly associated with greater reliance on both problem-solving and cognitive support strategies, while also showing a moderate positive link with overall reading difficulties.

The present findings reinforce and expand upon the core conclusions of Oranpattanachai (2023) and Rahman et al. (2023) regarding the critical role of reading strategies in English language learning. While Rahman et al. (2023) established that reading difficulties are closely tied to online strategy use, the present study provides granular evidence for this relationship by demonstrating a moderate positive correlation between top-down reading and word-level reading difficulties. Similarly, while Oranpattanachai (2023) highlighted the general efficacy of top-down processing for comprehension, the present results deepen this insight by revealing strong positive associations between top-down reading and both problem-solving and cognitive support strategies. Most importantly, this study directly addresses the empirical gap left by both prior investigations: by examining top-down reading alongside both difficulties and strategy sub-types within the same population, it demonstrates that learners facing textual challenges actively mobilize top-down strategies alongside problem-solving and cognitive supports to regulate their online reading process.

Implications and Suggestions for Future Research

Theoretical and Conceptual Implications

Conceptually, these findings demonstrate that reading online is a dynamic, cognitively demanding process where digital environments shift reader behavior toward intrinsic mental management, such as self-questioning and targeted problem-solving rather than external physical strategies. Theoretically, this validates Schema Theory by showing that readers actively construct meaning through top-down processing regardless of format preference, while aligning with Cognitive Load Theory by revealing that intense strategic navigation increases perceived mental burden when navigating reading difficulties. Ultimately, the lack of demographic influence highlights that online metacognition is a universal cognitive response to textual complexity rather than a trait dependent on background, reinforcing that active reading strategies and cognitive load are fundamentally interdependent in digital reading environments.

Pedagogical Implications

Based on these findings, a few implications in teaching can be considered. First, since online readers rely heavily on metacognitive strategies, teachers should model top-down strategies by clearly showing students how to set a reading goal, preview structures and actively monitor their understanding as they scroll through the reading materials. In addition, classroom environments should encourage low-stakes, non-competitive reading tasks or activities. Teachers can opt to problem solving activities where students share their knowledge and skills to work through difficult passages. This supports the effort to decrease reading anxiety from internal frustration and peer pressure. Besides, the findings show that heavier reliance on top-down strategies correlates with higher reading difficulties. To prevent cognitive overload, teachers can help by scaffolding technique; building background knowledge before assigning digital readings and breaking complex texts into smaller and comprehensible chunks.

Suggestions for Future Research

Present study employed quantitative research design which limits the affective factors of the correlations. Hence, future research should consider a qualitative or mixed-method approach to capture readers' emotional experience, offering deeper context that statistical correlations alone might miss. Since this study found out that majority readers prefer print, there is a concern if they actually use different metacognitive strategies on paper compared to on a screen. Therefore, future research may uncover whether reading preference is psychologically related to how readers process information in texts.

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APPENDIX

Reading Difficulties & Perceived Use Of Online Reading Strategies

SECTION	VARIABLE	CONSTRUCT	Item/ INDICATOR	Tot
B	Reading Difficulties (Abeeleh & Al-Sobh, 2021)	Text-Related	8	13
		Anxiety	5	
C	READING STRATEGIES (Amer,et.al.,2010)	Global	6	18
		Problem-Solving	6	
		Support	6	
				31

Section B- Reading Difficulties

Text-Related (TR)

ITEM	1	2	3	4	5
TRQ1I faced a problem in figuring out the meanings of some new words in the reading text					
TRQ2I faced a problem in identifying the aim behind reading comprehension					
TRQ3I faced difficulty in guessing the meanings of some new words					
TRQ4I faced a problem in distinguishing main ideas from supporting ideas in the reading text					
TRQ5I faced difficulty in extracting main and detailed ideas in the text					
TRQ6I faced difficulty in recognizing the total meaning of the text					
TRQ7I usually translate word by word when I am reading					
TRQ18I faced difficulty in summarizing the main ideas of the text					

Anxiety (A)

ITEM	1	2	3	4	5
AQ1I feel stressed when reading a text in English in the classroom.					
A20I never feel quite sure of myself when I am reading in the classroom.					
AQ3I keep thinking that the other students are better at reading than I am.					
AQ4 Even if I am well prepared for the class, I feel anxious about reading materials written in English.					
AQ5I feel upset when I don't understand what I read in English					

Section C-Reading Strategies

Global Strategies

ITEM	1	2	3	4	5
GSQ 1I think about whether the content of the on-line text fits my reading purpose					
GSQ 2When reading on-line, I decide what to read thoroughly and what to ignore					
GSQ3I use context clues to help me better understand what I am					

reading online					
GSQ4I use typographical features like boldface and italics to identify key Information.					
GSQ5I try to guess what the content of the on-line text is about when I read.					
GSQ6 scan the on-line text to get a basic idea of whether it will serve my purposes before deciding to read it.					

Problem--Solving Strategies

ITEM	1	2	3	4	5
PSSQ1 I try to get back on track when I lose concentration					
PSSQ2 I adjust my reading speed according to what I am reading online					
PSSQ3 I stop from time to time and think about what I am reading online					
PSSQ4 When on-line text becomes difficult, I re-read it to increase my Understanding					
PSSQ5 When I read on-line, I guess the meaning of unknown words or phrases					
PSSQ6 I can distinguish between fact and opinion in on-line texts					

Support Strategies

ITEM	1	2	3	4	5
SSQ1 I take notes while reading on-line to help me understand what I read					
SSQ2 I use reference materials (e.g. an on-line dictionary) to help me understand what read on-line.					
SSQ3 I paraphrase (restate ideas in my own words) to better understand what I read on-line.					
SSQ4 ask myself questions I like to have answered in the on-line text					
SSQ5 When reading on-line, I translate from English into my native language					
SSQ6 When reading on-line, I think about information in both English and my mother tongue					