

Investigating EFL Learners' Awareness of Cognitive and Metacognitive Reading Strategies of Students in Different Disciplines

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Abstract

This research explores the awareness and use of cognitive and metacognitive reading strategies of Omani EFL (English as a Foreign Language) students studying different disciplines. The participants were three hundred and seventy-five Omani EFL first year diploma students studying biology, business, information technology, engineering, and English in a higher education institution in Oman. The study compared and contrasted strategy use across disciplines and examined the relationships among strategy preferences and discipline. Survey of Reading Strategies (SORS), a self-report questionnaire by Mokhtari and Sheorey (2002) was used to collect data. Statistical and descriptive analysis indicates that Omani EFL learner's most preferred category of reading strategies was cognitive strategies, followed by support strategies and metacognitive strategies. One-way ANOVA (analysis of variance) revealed no significant differences between students of the disciplines mentioned above in terms of strategy preferences for metacognitive, cognitive, and support strategies. The findings provide insight for curriculum developers and teachers towards the strategy preferences of Omani EFL students.

Keywords: cognitive strategies, metacognitive strategies, Omani EFL learners, reading strategies

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Introduction

Metacognitive awareness of reading strategies helps learners decide which strategies they can use and how they should use them. Research associated with reading English in L1 and L2 reveals that metacognitive awareness significantly impacts reading comprehension (Baker, 2008; Carrell, Gajdusek, & Wise, 1998; Carrell, Pharis, & Liberto, 1989). Researchers have found that skilled readers in L1 and L2 are aware of metacognitive skills such as planning, monitoring, goal setting, and assessment strategies (Carrell et al., 1998; Cohen, 1998; Mokhtari & Sheorey, 2008).

Afflerbach (1998) suggests that successful readers have a command of the language, knowledge, and experience of strategies to solve the difficulties they encounter during reading. On the other hand, less successful readers must work hard and develop their reading proficiency by using different strategies. Therefore, in an academic setting, teachers need to be aware of the strategies that both successful and less successful students use to assist them.

Various factors impact learners' strategy preferences such as age, gender, years of study, language proficiency, learning style, and ethnicity (Peacock & Ho, 2003; Sheu, Wang, & Hsu, 2013). Some studies have also found that learner's field of specialization also influences their reading strategy preferences. Several studies have explored the metacognitive strategy preferences of learners in different disciplines such as English, science, business, and humanities (Park, 2010; Magogwe, 2013; Dabaghi & Akvan, 2014). With the growing number of colleges and universities in Oman, teachers need to be aware of cognitive and metacognitive reading strategies used by students studying in different disciplines.

Purpose of the Study

The current study aims to examine the cognitive and metacognitive reading strategies preferences of Omani EFL students studying engineering, business studies, information technology, English, and biology disciplines.

Research Question

The present study aims to investigate the following research question:

1. Which categories of reading strategies, namely cognitive, metacognitive, and support strategies, do students of engineering, business studies, information technology, English, and biology use?

Literature Review

What is Reading?

Reading helps the learners to develop their language and knowledge of vocabulary. Snow (2002) states that reading comprehension is “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (p.11). When learners read, they interpret, integrate, critique, infer, analyze, connect, and evaluate ideas in texts. They also try to negotiate multiple meanings in their minds. Understanding a text is not only a process that involves breaking down complicated units of language into simple ones. Nevertheless, it also involves a process in which multiple units combine to build a larger picture.

Definition of Reading Strategies

Several definitions of reading strategies are found in the literature. Carrell et al. (1998) described reading strategies as the approaches readers use to comprehend the text. Also, Brantmeier (2002) stated reading strategies as “the comprehension processes that readers use in order to make sense of what they read” (p.1). In other words, reading strategies comprise ways in which readers respond to a task, such as a focus on context clues, use prior knowledge, and search for content clues to comprehend a text.

O'Malley and Chamot (1990) further explained that reading strategies are conscious or unconscious procedures, actions, techniques, or behaviors that learners use to overcome the problems they encounter during comprehension and interpretation of a text.

Classification of Reading Strategies

Literature reveals that there are different categories of reading strategies. The most common classification of reading strategies is the distinction between metacognitive and cognitive strategies. El-Kaomy (2004) categorized metacognitive strategies into three categories: planning, self-monitoring, and self-evaluation. Santrock (2008) found that metacognitive strategies involve goal setting, selective attention, planning for the organization, monitoring, self-assessment, and regulation.

Singhal (2001) describes cognitive strategies as those utilized by learners to transform the language and consist of summarizing, paraphrasing, analyzing, and using context clues. Akyel and Ercetin (2009) suggest that cognitive strategies can help readers make meaning from a text.

Sheorey and Mokhtari (2001) divided reading strategies into three categories: metacognitive, cognitive, and support strategies. According to their definitions, metacognitive strategies were intentionally, and carefully planned techniques used by learners to monitor their reading. Cognitive strategies were specific actions and procedures which learners used while working directly with the text. Support strategies referred to approached readers used tools to understand a text, such as using a dictionary, taking notes, or underlining or highlighting the text. Mokhtari and Sheorey (2002) renamed these two categories of ESL reading strategies. Thus, metacognitive strategies were called global reading strategies and cognitive strategies as problem-solving reading strategies.

Review of Research on Cognitive and Metacognitive Reading Strategies

Reading strategies is one of the most researched areas in the field of research on the English language. Many studies have investigated the metacognitive reading strategies of learners. However, these studies were limited to comparing high and low-proficiency students and those studying at the secondary or pre-university levels (Sheorey & Mokhtari, 2001). Moreover, few studies explored the strategy preferences of undergraduate learners. Magogwe (2013) examined the reading strategy preferences of university students studying social sciences in Botswana. Results of the study revealed that social sciences students used cognitive strategies with high frequency, while metacognitive strategies and support strategies were reported as medium use.

Maarof and Maasum (2012) inspected the reading strategies of EFL undergraduates in Malaysia. The findings indicated that cognitive strategies were the most favored strategies of the undergraduates, so they were frequently used. Metacognitive strategies were the second most

preferred strategies and were ranked as high usage, while support strategies were the least preferred strategies but ranked as medium use.

In another study, Commander, Ashtong, and Zhao (2016) diagnosed the language learning strategy preferences of undergraduate students in the United States and China. The study found that the overall strategy preferences of the US and Chinese students were the same. Both groups' most preferred strategies were cognitive strategies. After that, the second most preferred category was metacognitive strategies, while the least preferred was support strategies.

Shoerey and Mokhtari (2001) conducted a study to identify the metacognitive reading strategy differences between native and non-native college students in the United States. They found that both ESL and native English-speaking US students' preferences for the three categories of Survey of Reading Strategies (SORS) were the same. Both groups' most preferred category was cognitive strategies. The second most preferred strategies were metacognitive, and the least preferred ones were support strategies.

Regarding Oman, there have been numerous studies that have investigated metacognitive reading strategies preferences of Omani EFL learners (Awadh, 2003; Alami, 2016; Al Seyabi & Tuzlukova, 2015; Amer, Al Barwani & Ibrahim, 2010). However, few studies focused on the strategy preferences of learners at higher education institutions. Amer et al. (2010) investigated online reading strategies of first-year and fourth-year Omani students undergoing teacher training in a university. Survey of Reading Strategies (SORS) was used in an online survey format. The researchers did not find any significant differences between both groups on overall strategy use as well as their preferences for metacognitive, cognitive, and support strategies.

Awadh (2003) studied the language learning strategies used by first-year graduates enrolled in Sultan Qaboos University. She reported that Omani students used cognitive strategies more than metacognitive strategies.

Methodology

Participants

The participants in this study were 375 undergraduate students. Among them, 246 were females, and 129 were males. These students were enrolled in the first-year Diploma program and belonged to various specializations, namely English, biology, engineering, information technology (hereafter IT), and business studies.

Instrument

This study employed the Survey of Reading Strategies (SORS) as the instrument. SORS is based on the Metacognitive Awareness of Reading Strategies Inventory (MARS), which was initially developed by Mokhtari and Reichard (2002). According to Mokhtari and Sheorey (2002), SORS aims to “measure the type and frequency of reading strategies that adolescent and adult ESL students perceive they use while reading academic materials in English.” (p.4). The instrument consists of 30 items, each of which uses a 5-point Likert scale ranging from always (five), usually (four), sometimes (three), occasionally (two), and never (one). The questionnaire requires 10-15

minutes to complete it. Results reveal that the higher the score, the more chances the student is aware of and is most likely to use a reading strategy.

For this study, SORS was translated into Arabic to help the participants respond accurately to the items. A pilot study was conducted with seventy undergraduate students to measure the reliability and validity of the instrument. The internal consistency of the SORS instrument was found to be Cronbach's alpha =.85, thus indicating a high level of consistency. The reliability of the three subscales was as follows: Global Reading Strategies (Metacognitive Strategies) (0.68), Problem Solving Strategies (Cognitive Strategies) (0.69), and Support strategies (0.71). These indices reveal that the instrument is reliable for assessing students' cognitive and metacognitive strategies in different disciplines (Taber, 2017).

Procedure

The participants were informed about the aim of the study. They were asked to sign a consent form. The students were instructed that the questionnaire had a rating scale ranging from one to five, and they had to circle the appropriate number indicating the frequency with which they used the reading strategy.

Data Analysis

Descriptive statistics and inferential statistics were performed on the three categories of strategies in order to identify the most and least frequently used strategies of different disciplines. The descriptive statistics included means and standard deviation of the three categories of strategies across students of biology, business studies, IT, engineering, and English. One-way multivariate analysis of variance (MANOVA) was used to test if the specializations differ significantly in their preferences of metacognitive strategies, cognitive strategies, and support strategies.

Results

According to Mokhtari and Sheorey (2002), as the frequency of strategy use on the SORS scale ranges from one to five, the students' responses can be classified using the three levels of strategy use developed by Oxford and Burry-Stock (1995) for general learning strategy use. In this classification, a mean of 3.5 or higher is considered high, a mean range between 2.5-3.4 is considered moderate usage, and a mean of 2.4 or lower is considered low usage. Table 1 reveals overall strategy preferences across majors.

Table 1 *Overall Strategy Preferences Across Majors (n= 375)*

Category of Strategy	Mean	SD.	Level
Metacognitive	3.37	0.50	Moderate
Cognitive	3.75	.58	High
Support	3.63	.63	High

As Table 1 indicates, cognitive strategies were given the highest mean (M=3.75), followed by support strategies (M=3.63), while metacognitive strategies (M=3.37) were given moderate mean. Thus, we can conclude that cognitive strategies and support strategies were the most preferred strategies of students of biology, business studies, IT, engineering, and English. In contrast,

metacognitive strategies were rated at moderate usage by students of the disciplines mentioned above.

Metacognitive Strategy Preferences of Various Disciplines

Table 2 *Most Preferred Metacognitive Strategy Preferences of Various Disciplines*

Discipline	Most Preferred Metacognitive Strategies
biology, engineering, IT, English	I use tables, figures, and pictures in text to increase my understanding
business studies	I check my understanding when I come across new information

According to Table 2, "I use tables, figures, and pictures in text to increase my understanding" was the most preferred metacognitive strategy of biology ($M=3.92$, $SD=0.96$), IT ($M=3.79$, $SD=0.94$), engineering ($M=3.80$, $SD=1.02$), and English ($M=3.87$, $SD=1.02$) students. Nevertheless, business studies students selected "I check my understanding when I come across new information" ($M=3.67$, $SD=0.93$) as their most preferred metacognitive strategy.

Table 3 *Least Preferred Metacognitive Strategy Preferences of Various Disciplines*

Discipline	Least Preferred Metacognitive Strategies
business studies, IT engineering, English	I critically analyze and evaluate the information presented in the text
biology	When reading, I decide what to read closely and what to ignore

Table 3 shows that "I critically analyze and evaluate the information presented in the text" was selected as the least preferred metacognitive strategy by business studies ($M=2.55$, $SD=1.14$), IT ($M=2.76$, $SD=1.14$), engineering ($M=2.90$, $SD=1.06$) and English ($M=2.67$, $SD=1.22$) students. On the other hand, biology students least preferred metacognitive strategy was "When reading, I decide what to read closely and what to ignore" ($M=2.95$, $SD=1.23$).

Cognitive Strategy Preferences of Various Disciplines

Table 4 *Most Preferred Cognitive Strategy Preferences of Various Disciplines*

Discipline	Most Preferred Cognitive Strategies
biology, engineering, IT.	I read slowly and carefully to make sure I understand what I am reading
business studies, English	When text becomes difficult, I pay closer attention to what I am reading

As shown in Table 4, "I read slowly and carefully to make sure I understand what I am reading" was the most preferred cognitive strategy of biology ($M=4.16$, $SD=0.83$), IT ($M=3.79$, $SD=1.04$), and engineering ($M=4.00$, $SD=1.01$) students. On the other hand, business studies ($M=4.06$,

SD=1.10) and English students (M=4.29, SD= 0.99) selected "*When text becomes difficult, I pay closer attention to what I am reading*" as their most preferred cognitive strategy.

Table 5 *Least Preferred Cognitive Strategy Preferences of Various Disciplines*

Discipline	Least Preferred Cognitive Strategies
biology, business studies, engineering	I adjust my reading speed according to what I am reading
English, IT.	I stop from time to time and think about what I am reading

Table 5 reveals that the least preferred cognitive strategy of biology (M= 3.63, SD=1.06), business studies (M= 3.30, SD=1.20), and engineering (M=3.32, SD=1.12) students were "*I adjust my reading speed according to what I am reading.*" In contrast, the least preferred strategy of IT (M=3.44, SD=0.95) and English (M=3.19, SD=1.06) students was "*I stop from time to time and think about what I am reading.*"

Support Strategy Preferences of Various Disciplines

Table 6 *Most Preferred Support Strategy Preferences of Various Disciplines*

Discipline	Most Preferred Support Strategies
biology, I.T	I underline or circle information in the text to help me remember it
business studies, English engineering	When reading, I think about information in both English and my mother tongue

Table 6 indicates that the most preferred support strategy of biology (M= 4.10, SD=0.99) and IT (M=4.08, SD=0.91) students were "*I underline or circle information in the text to help me remember it.*" On the other hand, the most preferred support strategy of business studies (M= 4.17, SD=0.88), engineering (M=3.99, SD=1.02), and English (M= 4.05, SD=0.96) students was "*When reading, I think about information in both English and my mother tongue.*"

Discipline	Least Preferred Support Strategies
business studies, English	When text becomes difficult, I read aloud to help me understand what I read
IT, engineering	I go back and forth in the text to find relationships among ideas in it
biology	I take notes while reading to help me understand what I read

Table 7 *Least Preferred Support Strategy Preferences of Various Disciplines*

According to Table 7, the least preferred support strategy of business studies ($M=2.98$, $SD=1.63$) and English ($M=2.98$, $SD=1.41$) students was "When text becomes difficult, I read aloud to help me understand what I read." In contrast, the least preferred support strategy of IT ($M=3.16$, $SD=1.15$) and engineering ($M=3.31$, $SD=1.01$) was "I go back and forth in the text to find relationships among ideas in it." On the other hand, biology students' least preferred support strategy was "I take notes while reading to help me understand what I read" ($M=3.81$, $SD=1.24$).

Statistical Analysis for the Research Question

Using the three scales as dependent variables, and the specializations as independent variables, one-way multivariate analysis of variance (MANOVA) was used for statistical analysis.

Table 8 *Levene's Test of Equality of Error Variances*

Levene's Test of Equality of Error Variances				
	F	df1	df2	Sig.
Cognitive	1.792	4	370	.130
Metacognitive	1.688	4	370	.152
Support strategies	.627	4	370	.644

Table 8 reveals that the assumption of the equality of variances across groups, which is required for post-hoc separate ANOVAs, is not violated for each of the three dependent variables. This is because the p-value of Levene's test is greater than 0.05 for each of the three dependent variables: metacognitive ($p=0.152$), cognitive ($p=0.130$), and support strategy ($p=0.644$). Also, the assumption of multivariate normality may be assumed to be fulfilled as the data is large, with 375 participants for each dependent variable.

Table 9 *Results of Multivariate Tests*

Effect		Value	F	Hypothesis df	Error df	Sig	Partial Eta Squared
Intercept	Wilks' Lambda	.019	6229.484 ^a	3.000	368.000	.000	.981
Discipline	Wilks' Lambda	.966	1.064	12.000	973.928	.388	.011

a. Exact statistic
b. The statistic is an upper bound on F that yields a lower bound on the significance level.
c. Design: Intercept + Discipline

The results of multivariate tests in Table 9 reveal that assumptions of variance-covariance matrices, equality of variances across groups, and multivariate normality of the MANOVA are satisfied. Also, multivariate test results show that Wilks' Lambda ($p=0.368$) is not significant at 0.05 level as the p-value is greater than 0.05. Hence, we can conclude that there are no significant disciplinary differences along with these measures.

Discussion

This study explored the cognitive and metacognitive strategy preferences of students studying different disciplines, namely biology, business studies, IT, engineering, and English. It was found that students of biology, business studies, IT, engineering, and English most preferred category of reading strategies were cognitive strategies ($M=3.75$, $SD=.58$), followed by support strategies ($M=3.63$, $SD=.63$) and metacognitive strategies ($M=3.37$, $SD=0.50$). These findings suggest that Omani EFL learners have greater awareness and used cognitive strategies more frequently than the other two categories of reading strategies. This finding is consistent with research studies conducted in similar EFL learning environments (Maarof & Maasum, 2012; Commander et al., 2016), which report cognitive strategies were the most preferred category of strategies of EFL learners.

Besides cognitive strategies, the students rated support strategies with high usage, and metacognitive strategies were rated with moderate usage. However, these results contradict previous studies conducted in a similar second language learning environment. These studies state that learners' second most preferred category of strategies was metacognitive strategies and least preferred was support strategies (Magogwe, 2013; Sheorey & Mokhtari, 2001).

From the results, it can be inferred that the students did not select metacognitive strategies as they found them challenging. Metacognitive strategies such as "*analyzing and evaluating what is read*" and "*confirming predictions*," require additional training to know how to use them. Therefore, it can be assumed that students do not know how to use them. In comparison to metacognitive strategies, support strategies such as "*taking notes while reading*," "*underlining information in text*," and "*going back and forth in text*" were preferred by many students as they were familiar with them. The researcher believes that students need to be given training for metacognitive strategies.

Conclusion

This study has made a significant contribution towards understanding cognitive and metacognitive reading strategy awareness and the use of Omani EFL learners studying biology, business studies, IT, engineering, and English in a higher education institution in Oman. Based on the findings, this study concludes that cognitive strategies are the most preferred reading strategies among Omani EFL students studying biology, engineering, business studies, IT, and English. Support strategies were the second most preferred category, while metacognitive strategies ranked least preferred by Omani students of different disciplines. The results go hand in hand with the existing literature that has revealed that cognitive strategies are the most preferred strategies of Omani learners (Awadh, 2003; Amer et al., 2010). However, we cannot underestimate the importance of metacognitive strategies. Metacognitive strategies go beyond the cognitive mechanism and allow learners to manage their learning through planning, monitoring, and evaluating. Researchers have spoken about the positive effects of applying metacognitive strategies in the reading process (Mokhtari & Sheorey, 2008; Baker, 2008). Hence, there is a need to help Omani students develop their metacognitive awareness, which will enable them to deal with different problems encountered while reading a text.

Implications

The findings of the study have an essential pedagogical implication. The research results have shown that the importance of metacognitive strategies for EFL learners is an area that needs more attention. To assist less successful learners, teachers should focus on the metacognitive strategies identified in the instrument and add them to the curriculum. Therefore, curriculum designers should collaborate with English language instructors and integrate metacognitive reading instruction in the Foundation and Post-Foundation programs. Thus, it is essential to assess the needs of the learners and plan the courses. The institution's management needs to recruit trainers who can guide teachers about the instruction of different metacognitive strategies.

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