# FL READING STRATEGY USE, READING PROFICIENCY AND ACHIEVEMENT: IS THERE ANY RELATIONSHIP?

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## ABSTRACT

FL reading strategies are crucial for ESP learners as these learners have to deal with various academic reading materials for their academic studies. It is assumed that one's engagement with awareness and regulation of reading strategies while reading academic materials may also be closely related to proficiency and reading performance in the target language. Although performance on a reading task or test may be an indicator of using effective and appropriate strategies, learners who do well on general reading performance tests may lack using reading strategies effectively when they are reading academic materials. Hence, this study aims at investigating the relationship between FL reading strategy use and performance on different FL reading tests in academic reading settings. For this purpose, 65 ESP students in a Turkish university context participated in the study. Correlation analyses and regression analyses were carried out between the participants' scores on a reading strategy survey and their scores on reading proficiency and achievement tests. The results have yielded that ESP students in this study used various FL reading strategies while reading academic materials. However, there were weak correlations between FL reading strategy use and performance on both reading proficiency and achievement tests. These findings suggests that ESP students need to employ more and effective FL reading strategies both to handle academic texts and to be successful on various measures related to reading. The findings were discussed in the light of the relevant literature and pedagogical implicatrions were drawn to illuminate futher studies.

**Key Words:** FL reading strategy, ESP learners, FL reading strategy use and test performance.

## INTRODUCTION

There has been a growing attention in the identification and characterization of individual characteristics that lead to variation in performance on language tests. It is assumed that test takers' performance has been influenced by many factors. Bachman & Palmer (1996) assert that there are four types of influence on the test takers' scores. These are classified as communicative language ability, test method facets, random factors and personal characteristics. Among these factors, personal characteristics of the test takers are individual attributes that are not part of test takers' language ability. However, they still influence their performance on language tests (Bachman, 1990; Brown, 1994; Cohen, 1994; Bachman &Palmer, 1996; Kunnan, 1996; In'nami, 2006; Dodeen, 2008). As an important aspect of test taker characteristics, strategy use is an attribute that differentiate successful language learners from the unsuccessful ones; hence understanding their role and importance in relation to language test performance is crucial.

One area of language learning which requires the mastery of strategies is reading in the target language as the strategies used during reading are assumed to have a positive relationship to the reading test performance (Phakiti, 2003). This brings us to the concept of foreign language reading strategies which are important for successful reading experience and reading test performance in the target language. Foreign language (FL)

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reading strategies are defined as the mental actions readers employ when they approach a text written in the target language effectively to make sense of it (Singhal, 2001; Aarnoutse & Schellings, 2003; Pani, 2004; Yang, 2006; Bolanos, 2012). They involve metacognitive control such as planning and monitoring one's own understanding and conscious execution of certain actions to achieve a particular goal while reading in a foreign/second language (Auerbach and Paxton, 1997). Successful FL readers are assumed to employ more effective and appropriate reading strategies compared to less successful ones (Phakiti, 2003). Likewise, & Chan (2003) put forward that poor FL readers are deficient in multiple reading processes as they have difficulty in drawing inferences, and lack metacognitive ability related to monitoring and planning for their reading process. In ESP/EAP context, readers are assumed to face with more challenges as they have to deal with academic texts from a variety of sources (Davis, 1995; Kavaliauskiene, 2003; O'Reilly & McNamara, 2007). Hence, conscious awareness and actual use of FL reading strategies are required in order to deal with academic reading materials written in the target language. One's engagement with awareness and regulation of reading strategies while reading academic materials may also be closely related to proficiency and reading performance in the target language (Kleitzen, 1991; Song, 1998; Singhal, 2001; Ikeda & Takeuchi, 2006; Ghavmnia, Ketabi & Tavakoli, 2013). Performance on a reading task or test may be an indicator of using effective and appropriate strategies (Phakiti, 2003). However, learners who do well on general reading performance tests may fail to use effective reading strategies when they are reading academic materials (Mokhtari and Sheorey, 2002). Thus, this study aims at investigating the relationship between FL reading strategy use and performance on different FL reading tests in academic reading settings.

## REVIEW OF LITERATURE

Results on reading comprehension tests are used to characterize readers, but these results do not provide any insight into the processes readers have used (Phakiti, 2003). Hence, understanding of readers' metacognitive knowledge about reading and reading strategies may help to shed a considerable amount of light into the variation in test performance. Based on the shift in attention from a focus on the product of reading such as a score on a reading comprehension test to an emphasis on determining the strategies that FL readers use, various studies have been conducted.

In one of the earlier attempts, Anderson (1991) aimed at examining the individual differences of second language readers while taking reading comprehension tests, and evaluating the extent to which reading comprehension processes during a test reflect the reading comprehension processes during academic reading. Results of think aloud protocols and simple regression analyses have indicated that there was no statistically significant relation between the number of strategies reported and overall performance on the reading measures. Anderson's (1991) study emphasized the role of strategic application while reading in the target language and put forward that strategic reading is not only a matter of knowing what strategy to use but how to use it. This study also highlighted the need for the investigation of FL/SL reading strategies in relation to performance on differen tests.

Based on the need for such investigation and concerns about the identification and characterization of individual characteristics to understand variation in reading test scores, Phakiti's (2003) study focused on exploring the nature of cognitive and metacognitive strategies used in EFL reading comprehension test and their relationship to EFL reading comprehension test performance in a Thai university context. Correlation analysis has indicated that there is positive but weak relationship of cognitive strategies and metacognitive strategies to the reading test performance. Post hoc tests revealed that highly successful test takers were more metacognitive, and strategies were found to come into play when test takers are faced with difficulties or problems. Phakiti's (2003) study concluded that cognitive and metacognitive strategy use may explain variation on language test performance.

FL reading strategies ESL/EFL learners use while reading academic materials has also received growing attention in recent years. Mokhtari & Reichard (2004) conducted a study to understand differences in metacognitive awareness and perceived strategy use by proficient native speakers of English, and Moroccan native speakers of Arabic and French who speak English as a FL. Although the two student groups have been

schooled in significantly different socio-cultural environments, they exhibited similar patterns of strategy awareness and reported usage while reading academic materials in English. The findings of this study helped to dispel the common misunderstanding that SL/FL learners are often at risk of failure when studying language as proficient L2 readers do not differ significantly from the native speakers in terms of reading strategy use.

Investigation of FL reading strategy use has been expanded to various educational contexts. In a Chinese context, Lau & Chan (2003) focused on exploring differences in strategy use between Chinese good and poor readers. Good readers were found to use more strategies while reading with significant differences in pre-reading strategies, main idea identification and reading monitoring strategies. They frequently used strategies like paraphrasing, identifying key words and topic sentences, activating prior knowledge, elaborating, comparing and drawing inferences. As for poor readers, they simply read the texts word by word without any strategy use, and had difficulty in lexical level, no processing at deep level. Both good and poor readers did not have confidence in reading ability with good readers having more intrinsic goals while reading. Lau & Chan's (2003) study emphasized the importance of cognitive, metacognitive processes and positive beliefs, and awareness of using reading strategies.

Based on a need to investigate FL reading strategy use of Spanish university students, Martinez (2008) conducted a study to assess the metacognitive awareness and perceived strategy use of ESP students who are native speakers of Spanish and read academic texts written in English. Furthermore, this study aimed to increase understanding of readers' metacognitive knowledge about reading and reading strategies in ESP Spanish context. Results have put forward that students showed a preference for Problem-Solving strategies followed by Global reading strategies and Support reading strategies. As a result, this study highlighted awareness of reading strategies for non-native readers and development of constructively responsive reading.

As can be seen from the review of literature on FL reading strategies and their influence on reading performance, the need for conducting more studies on FL reading strategies and kearners' performance on different tests in different educational contexts is emphasized. Mokhtari & Reichard (2004) and & Chan (2003) assert that further studies are required on the awareness of reading strategy use and other variables like achievement and reading ability levels. Likewise, Martinez (2008) pinpoints the importance of investigating the relationship between FL reading strategy use and performance on reading tests and tasks. Especially in ESP context, conducting such studies is crucial in order to shed light on FL reading strategy use of students who have to read large amounts of academic materials and to understand how their performance on tests are influenced by their employment of FL reading strategies. What is more, studies focusing on the FL reading strategy use and its relation to performance on different tests are scarce in Turkish ESP context. Hence, there is a gap in the recent literature for such studies that would provide valuable insight in understanding Turkish ESP students' awareness of using FL reading strategies and variation in their performance. Based on such a need, this study seeks to find out the ansers of the following reserach questions:

1. What are the reported FL reading strategies of the ESP students who have to deal with various academic reading materials?
2. Is there a relationship between FL reading strategy use and performance on a reading proficiency test of ESP students?
3. Is there a relationship between FL reading strategy use and performance on an achievement test of ESP students?

## METHODOLOGY

### Participants

The participants of this study were 65 ESP students enrolled in the Department of Materials Science Engineering. They were all monolingual speakers of Turkish and learn English as a foreign language. A non-probabilistic sampling was preferred as the participants were available and volunteer. These students were required to comprehend and interpret various academic materials in their field such as journal articles, assignments, and course books related their academic studies. Hence, employment of effective reading strategies is crucial for their success. At the time of the study, the participants were taking an additional ESP

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course that would help them in their content courses. As a requirement of this study, they have to take achievement tests and according to the results of these tests they fail or pass the course.

**Instruments**

In order to find out the reported FL reading strategies of the participants while reading academic materials, Survey of Reading Strategies (SORS) developed by Mokhtari & Sheorey (2002) was used. This instrument aimed to measure adolescent or adult students' metacognitive awareness and perceived use of FL reading strategies while reading academic materials.

SORS has three subscales, namely *Global Reading Strategies*, *Problem Solving Reading Strategies* and *Support Strategies*. *Global Reading Strategies* are techniques learners use to monitor or manage their reading such as having purpose in mind and previewing the text as to its length. *Problem Solving Strategies* are the actions and procedures that readers use while working directly with the text such as adjusting one's speed of reading when the material becomes difficult or easy. The final subscale *Support Reading Strategies* are basic support mechanisms aimed to aid the reader in comprehending the text such as using dictionary and taking notes.

The instrument includes 30 items designed on a 5-point Likert scale ranging from 1 (I never or almost never do this) to 5 (I always or almost always do this) to assess the perceived use of learners' FL reading strategy use. The instrument was found to have internal consistency (Cronbach Alpha 0.92), but in order to use the instrument in the Turkish ESP context, Cronbach Alpha reliability coefficient was computed and was found 0.80. English version of the instrument was administered to the subjects and when students had difficulty in understanding any of the items, further explanations were provided.

In order to investigate the relationship between FL reading strategy use and performance on a reading proficiency test of ESP students, reading section of a pen and paper TOEFL test was administered. This test includes 50 multiple choice questions focusing on the comprehension of reading texts on various subjects generally on topics college/university level students may deal with. To investigate the relationship between FL reading strategy use of the students

and their performance on an achievement test, an achievement test prepared by the ESP course instructor was used. This test was based on the syllabus covered throughout the term and aimed at measuring students' mastery of the course content. Course content included grammatical topics embedded in academic reading texts, listening and speaking topics on academic topics, and readings from a variety of academic sources related to the students' academic majors in engineering. The achievement test included three parts. The first part included questions on various grammatical items covered in the course, each presented with appropriate academic context related to engineering. The second part included a cloze test aimed assessing technical vocabulary learned in the class. Finally, the third part included reading passages on academic topics familiar to the students and open ended questions based on these passages.

**Data Analysis Procedures**

SORS scores for each subscale (Global reading strategies, Support reading strategies and Problem-Solving reading strategies) were calculated by using the scoring guidelines provided by Mokhtari & Sheorey (2002). Participants' scores on the reading proficiency test were calculated by following the directions provided by the official TOEFL centre. Achievement test was scored by the course instructor over 100 points. In order to find out whether there is a relation between FL reading strategy use of the participants and their performance on the proficiency and achievement tests, Pearson product moment correlation coefficient between participants' scores on the SORS and their scores on the reading proficiency and achievement tests was computed. Further linear regression analyses were carried out between the same variables in order to investigate the extent of the relationship and whether FL reading strategy use is an important factor in predicting performance on reading proficiency and achievement tests.

**RESULTS AND DISCUSSION**

**Results**

The first research question focused on identifying the FL reading strategy use of the participants while reading academic materials. In order to answer this, participants' responses to SORS were analyzed descriptively by calculating the means for each of the sub-categories, and overall FL reading strategy use. According to SORS scoring guideline provided by Mokhtari & Sheorey (2002), mean strategy use of 3.50 and above indicate high FL reading strategy use, whereas mean use between 3.49 and 2.50 indicate medium FL reading strategy use and mean strategy use of 2.49 and below indicate low FL reading strategy use. Figure 1 shows the distribution of the means according to three sub-categories and overall strategy use for all students in the study.
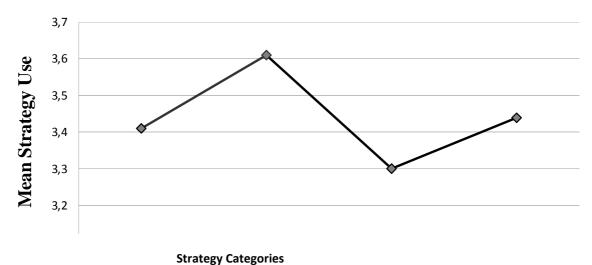


**Strategy Categories**

Figure 1: Distribution of the Mean Strategy Use according to FL Reading Strategy Categories.

As displayed in Figure 1 above, the overall FL reading strategy use is medium (3.44) among all the participants (n=65) in the study. The mostly used FL reading strategy category is *Problem-Solving Reading Strategies* (3.61) and is followed by *Global Reading Strategies* (3.41) and *Support Reading Strategies* (3.3) respectively.

To show the distribution of FL reading strategies in detail, means and standard deviations for each item on the instrument (SORS) were calculated. Table 1 below shows means and standard deviations for FL reading strategy use in each of the subscales.

Table 1: Distribution of Reading Strategies according to SORS Categories

| Categories | Strategy | Mean | SD |
|---|---|---|---|
| **GLOB 1** | Having a purpose for reading | 3.69 | 0.70 |
| **GLOB 2** | Using prior knowledge | 3.55 | 0.88 |
| **GLOB 3** | Previewing the text before reading | 3.40 | 0.98 |
| **GLOB 4** | Checking how text content fits purpose | 3.41 | 0.86 |
| **GLOB 5** | Skimming to note text characteristics | 3.21 | 1.15 |
| **GLOB 6** | Determining what to read | 3.43 | 1.04 |
| **GLOB 7** | Using text features (e.g., tables, figures) | 3.69 | 1.24 |
| **GLOB 8** | Using context clues | 3.24 | 0.88 |
| **GLOB 9** | Using typographical aids (e.g., italics) | 3.27 | 1.19 |
| **GLOB 10** | Critically evaluating what is read | 3.35 | 0.87 |
| **GLOB 11** | Resolving conflicting information | 3.58 | 0.98 |
| **GLOB 12** | Predicting or guessing text meaning | 3.38 | 1.08 |

| GLOB 13 | Confirming predictions | 3.16 | 1.09 |
|---|---|---|---|
| **PROB 1** | Reading slowly and carefully | 3.49 | 0.95 |
| **PROB 2** | Trying to stay focused on reading | 3.86 | 0.88 |
| **PROB 3** | Adjusting reading speed | 3.69 | 0.96 |
| **PROB 4** | Paying close attention to reading | 3.75 | 1.00 |
| **PROB 5** | Pausing and thinking about reading | 3.49 | 0.98 |
| **PROB 6** | Visualizing information read | 3.47 | 0.90 |
| **PROB 7** | Re-reading for better understanding | 3.64 | 1.19 |
| **PROB 8** | Guessing meaning of unknown words | 3.49 | 1.03 |
| **SUP 1** | Taking notes while reading | 3.30 | 1.01 |
| **SUP 2** | Reading aloud when text becomes difficult | 2.33 | 1.19 |
| **SUP 3** | Underlining or circling information in the text | 4.07 | 1.14 |
| **SUP 4** | Using reference materials (e.g., dictionary) | 3.16 | 1.30 |
| **SUP 5** | Paraphrasing for better understanding | 3.26 | 1.04 |
| **SUP 6** | Going back and forth in text | 3.70 | 0.94 |
| **SUP 7** | Asking oneself questions | 2.40 | 1.18 |
| **SUP 8** | Translating from English into L1 | 3.07 | 1.14 |
| **SUP 9** | Thinking about information both in English and L1 | 3.53 | 1.13 |

A closer examination of Table 1 shows that of the 13 strategies related to Global FL reading strategies, four of them fell in the high usage category (mean of 3.5 and higher) whereas 11 of them fell in medium usage category (means between 2.5 and 3.49). As for eight strategies related to Problem-solving FL reading strategies, four of them were in the high usage category (mean of 3.5 and higher). The remaining four strategies fell in the medium usage category (means between 2.5 and 3.49). For the final sub-category of FL reading strategies, the Support reading strategies, only three of the strategies were in the high usage category (mean of 3.5 and higher). Four strategies related to Support reading strategies fell into the medium usage category (means between 2.5 and 3.49), and two strategies reported to be used in the low usage category (mean of 2.49 and below). Of the three sub-categories of FL reading strategies, only Support reading strategies included low usage strategies. Global and Problem-Solving strategies did not include low usage, and generally the participants' FL reading strategy use was at a medium level. In Table 2 below the five top most used and the bottom least used strategies were highlighted to show the most and the least preferred strategies by the participants.

Table 2: Distribution of the Most and the Least used FL Reading Strategies

| Category | Strategy |
|---|---|
| **SUP 3** | **Underlining or circling information in the text** |
| **PROB 2** | **Trying to stayed focused on reading** |
| **PROB 4** | **Paying cloze attention to reading** |
| **SUP 6** | **Going back and forth in text** |
| **PROB 3** | **Adjusting reading speed** |
| GLOB 1 | Having a purposes for reading |
| GLOB 7 | Using text features (e.g., tables, figures) |
| PROB 7 | Re-reading for better understanding |
| GLOB 11 | Resolving conflicting information |

| GLOB 2 | Using prior knowledge |
|---|---|
| SUP 9 | Thinking about information both in English and L1 |
| PROB 5 | Pausing and thinking about reading |
| PROB 8 | Guessing meaning of unknown words |
| PROB 1 | Reading slowly and carefully |
| PROB 6 | Visualizing information read |
| GLOB 6 | Determining what to read |
| GLOB 4 | Checking how text content fits purpose |
| GLOB 3 | Previewing the text before reading |
| GLOB 12 | Predicting or guessing text meaning |
| GLOB 10 | Critically evaluating what is read |
| SUP 1 | Taking notes while reading |
| GLOB 9 | Using typographical aids (e.g., italics) |
| SUP 5 | Paraphrasing for better understanding |
| GLOB 8 | Using context clues |
| GLOB 5 | Skimming to note text characteristics |
| **GLOB 13** | **Confirming predictions** |
| **SUP 4** | **Using reference materials (e.g., dictionary)** |
| **SUP 8** | **Translating from English into L1** |
| **SUP 7** | **Asking oneself questions** |
| **SUP 2** | **Reading aloud when text becomes difficult** |

Table 2 shows that both the most used five and the least used five categories included a mixture of Problem-Solving and Support strategies. The participants generally preferred underlining or circling information in the text as a support mechanism, trying to stay focused on reading when faced with difficulties, paying close attention to reading to overcome difficulties, going back and forth in the text to support their reading, and adjusting their reading speed to handle the difficulties they encounter. On the other hand, confirming predictions was not a common strategy preferred by the students, and using reference materials such as dictionary was not reported to be used much. Similarly, support strategies like translating from English into L1 and asking oneself questions were not used mostly by the students. The least used strategy was one of the support mechanisms of reading aloud when the text becomes difficult.

**FL Reading Strategy Use and Performance on a Reading Proficiency Test**
The second research question aimed to find out whether there is a relationship between ESP students' FL reading strategy use and their performance on a reading proficiency test. In order to answer this question, along with SORS, the reading section of a pen and paper TOEFL test was administered. The participants' reading proficiency scores ranged from 310 to 560.

The participants' scores on the reading proficiency test and their scores on SORS were correlated by computing Pearson Product moment correlation coefficient ($r = 0.298$). The correlation coefficient of 0.298 indicates a

slight but positive correlation between the reading proficiency scores and the FL reading strategy use scores of the participants.

Since the correlation between FL reading strategy use and reading proficiency performance did not indicate a strong relation, it is also important to know the extent of the relationship between these variables. For this purpose, linear regression analysis was carried out. This analysis is helpful to quantify the relationship between two or more variables in order to predict future behavior or results. That is, it is useful to investigate whether FL reading strategy use is an important factor in predicting FL reading proficiency and vice versa. Table 3 below shows the results of the linear regression analysis.

Table 3: Linear Regression Analysis between FL Reading Proficiency Test Scores and FL Reading Strategy Use

| Predictor Variable | N* | R | $R^2$ | F | p |
|---|---|---|---|---|---|
| FL Reading Strategy Use | 65 | 0.298 | 0.089 | 6.131 | 0.016 |

N*: Number of the participants

Table 3 above displays that FL reading strategy use of the participants is positively correlated with their FL reading proficiency scores (R= 0.298). That is, an increase in FL reading strategy scores indicates an increase in the FL reading strategy scores and vice versa. ANOVA results also confirms this finding (F=6.131; 1; 63; p= 0.016). Although there is a correlation between FL reading strategy use scores and reading proficiency test scores, when variance between FL reading strategy use scores and TOEFL scores ($R^2$) is taken into account, the FL reading strategy use can only explain 8.9 % of the total variance. This is not a high percentage and it indicates that FL reading strategy use can only be used to predict reading proficiency scores of the same students to a limited extent. Hence, FL reading strategy use is not a strong predictor of reading proficiency and vice versa. In order to cross check the results, when we look at the scotter plot of the regression analysis, it is clear that regression does not follow a straight linear pattern and the data is rather scattered. Such scattered data show that FL reading strategy use does not have a strong predictive value on the reading proficiency test scores. As a result, FL reading strategy use is not a strong predictor of FL reading proficiency and similarly FL reading proficiency is not a strong predictor of FL reading strategy use.

### Reading Strategy Use and Performance on an Achievement Test

The third research question aimed at investigating whether there is a relationship between FL reading strategy use of ESP students in the study and their performance on an achievement test. Achievement test given for this purpose was graded by the course instructor out of 100. Participants' achievement scores ranged from 33 to 97.

FL reading strategy use scores and achievement scores of the participants were correlated by using Pearson product moment correlation coefficient (r = 0.277). Similar to the correlation between FL reading strategy use and reading proficiency, the correlation coefficient found for the relationship between FL reading strategy use and achievement was statistically significant at the 0.05 significance level. However, this correlation is not high to indicate a predictive value for the variables. Thus, although there is a positive significant correlation between FL reading strategy use and achievement, there is a need to investigate the extent of relation between these variables to comment on the nature of relationship. For this purpose, a linear regression analysis was carried out. Table 4 below shows the results of the linear regression analysis between FL reading strategy use and achievement.

Table 4: Linear Regression Analysis between Achievement Test Scores and FL Reading Strategy Use

| Predictor Variable | N* | R | $R^2$ | F | p |
|---|---|---|---|---|---|
| FL Reading Strategy Use | 65 | 0.277 | 0.077 | 5.219 | 0.026 |

N*: Number of the participants

As can be clearly seen from the regression table, there is positive correlation between FL reading strategy use and achievement test scores ( R=0.277). A closer examination of Table 4 shows that FL reading strategy use can only explain 7.7% of the total variance. That is, although there is a statistically correlation between FL reading

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strategy use and achievement, this correlation does not indicate that FL reading strategy use is a strong predictor of achievement and likewise, achievement is not a strong predictor of FL reading strategy use. The scatterplot of the data shows that regression does not follow a straight linear pattern. This finding is similar to the findings on the relationship between FL reading strategy use and reading proficiency. As a result, FL reading strategy use is not a strong predictor of achievement and similarly achievement is not a strong predictor of FL reading strategy use in this study.

**DISCUSSION**

The results of the study have indicated that ESP learners in the study used various FL reading strategies while reading academic materials. Since they are ESP learners, it is revealed that these learners employ FL reading strategies to deal with academic materials they have to read. In general, results have put forward that ESP students used FL reading strategies at a medium level.

This finding of ESP students' using FL reading strategies at a medium level does not correspond to the findings of Sheorey & Mokhtari (2001) and Mokhtari & Reichard (2004). In these studies, both native and non-native university level students were found to show a high preference for using FL reading strategies while reading academic materials. All the students in these studies were proficient ESL students. However, students in ESP context in this study had a medium level of preference for FL reading strategies while reading academic materials. This finding may be attributed to participants' levels of proficiency in the target language. When the reading proficiency test scores were taken into account, it becomes clear that these students were not proficient learners as the learners in Sheorey & Mokhtari' (2001) and Mokhtari & Reichard's (2004) studies. Thus, they may not have a high awareness of using FL reading strategies while reading academic materials in an ESP context. What is more, findings of the study yielded that students mostly used *Problem-Solving* strategies such as trying to stay focused on reading, adjusting reading speed and visualizing information read. It was followed by *Global* reading strategies such as having a purpose for reading and previewing the text before reading, and *Support* reading strategies such as taking notes while reading and paraphrasing for better understanding. Among the three sub-categories of FL reading strategies, only *Problem-Solving* strategists were used at a high level. This finding is not congruent with the findings of Mokhtari & Reichard (2004) who found that both native and non-native ESL students had a preference for *Support* reading strategies. Unlike to the findings of Sheorey & Mokhtari (2001) and Mokhtari & Reichard (2004), in a rather recent study by Martinez (2008) Spanish university level ESP students were found to show higher reported use for *Problem-Solving* and *Global* reading strategies. The findings of the present study are in corroboration with that of Martinez (2008) as the students in a Turkish university ESP contexts showed a high preference for *Problem-Solving* and *Global* FL reading strategies rather than the Support reading strategies.

A possible explanation of this finding may be that ESP students face with certain difficulties while reading academic materials. As their level of reading proficiency is not high, they may have difficulty in handling their reading problems. Thus, they may show a preference for *Problem-Solving* strategies while reading academic materials. Moreover, the academic materials they have to read include various articles and texts about engineering; thus, they contain terminological vocabulary and expressions. If the ESP students do not have much vocabulary knowledge related to the academic engineering texts, they most of the time they have to employ *Problem-Solving* strategies such as guessing unknown vocabulary. Furthermore, the texts they have to read are authentic materials which contain academic language. Then, these students may also have difficulty in understanding the academic language and the complex structures these texts include. A similar concer was reported by Dhieb-Henia (2003) who found that students often have problems in dealing with academic texts in their fields of study due to the high range of vocabulary and relative importance of these texts to the students. She further claims that using appropriate reading strategies are crucial for these students to overcome the problems they experience. Likewise, O'Reilly & McNamara (2007) claims that students in ESP/EAP contexts may face with more challenges as they have to deal with academic texts from a variety of sources Hence, ESP students in the study may have a preference for the employment of *Problem-Solving* strategies similar to the ESP students in Martinez's (2008) and Dhieb-Henia's (2003) studies.

Another aim of the study was to investigate the relationship of FL reading strategy use with performance on reading proficiency and achievement tests. The findings have put forward that students' using more FL reading strategies does not mean that these students are successful reading proficiency and achievement tests. This finding is in parallel with that of Anderson (1991) who found no statistically significant relation between the number of strategies reported and overall performance on different reading measures. The positive and weak relationship between FL reading strategy use and performance on reading proficiency and achievement tests in this study is also in corroboration with the findings of Phakiti (2003) who found that there was positive but weak relationship of cognitive strategies and metacognitive strategies to the reading test performance. However, the finding on the weak correlation between FL reading strategy use and achievement does not correspond to O'Reilly and McNamara's (2007) study as strategy use showed a high correlation with achievement in their study.

In general, literature suggest that when students' proficiency level increases, their frequency of using FL/SL reading strategies increase similarly (Kleitzen, 1991; Song, 1998; Singhal, 2001). However, the results of the study showed that there was a weak correlation between FL reading strategy use and reading proficiency. That is, when students' reading proficiency increased, their scores on reading proficiency did not increase to indicate a strong relationship. Although students generally reported that they used FL reading strategies at a medium level, this strategy usage did not predict performance on the reading proficiency test.

Taillefer (2005) highlights that especially ESP students need to employ more FL reading strategies for success in their own academic fields. The results of the study suggests that ESP students need to employ more and effective FL reading strategies both to handle academic texts and to be successful on various measures related to reading.

## CONCLUSION

Researchers have long been aware that readers who use effective and appropriate FL reading strategies experience less difficulty and handle texts with more ease (Auerbach & Paxton, 1997; Pani, 2004; Yang, 2006). When it comes to ESP context, the importance of FL reading strategies are crucial for success as these learners have to deal with various academic reading materials for their academic studies. Moreover, use of FL reading strategies is an important aspect of strategic competence learners should possess in order to be successful on language tests (Bachman & Palmer, 1996). Although ESP students in this study used various FL reading strategies while reading academic materials, there were weak correlations between FL reading strategy use and performance on both reading proficiency and achievement tests. This finding has certain pedagogical implications for ESP students.

First of all, since the ESP students reported a medium level of FL reading strategy use and awareness in this study, the need for strategy training is highlighted. ESP students have to deal with authentic academic materials especially for their own academic studies and in order to handle these texts more successfully, strategy training is required. If these students use more FL reading strategies effectively and appropriately, they may show more success both on reading proficiency and achievement tests. Many researchers highlighted the implementation of strategy training to gear the use of reading strategies for different purposes (Song, 1998; Singhal, 2001; Ikeda & Takeuchi, 2006; Ghavamnia et al., 2013). Thus, implemention of strategy training into ESP courses may help ESP students deal with academic texts with more ease. In this respect, teachers have an indispensable role in the teaching and application of appropriate FL reading strategies. They may guide ESP learners become aware of FL reading strategies.

One of the problems ESP learners face may be highly related to the unknown terminology in academic texts and lack of necessary background knowledge (Pritchard & Nasr, 2004; O'Reilly & McNamara, 2007). To overcome such difficulty, students may be given training in how to deal with the unknown words in academic texts and how to use necessary background knowledge to understand these texts. Teachers may also design activities and tasks to teach how to implement effective and appropriate FL reading strategies. What is more,

teachers' selection of academic texts and their guidance for learners to select the appropriate academic materials would be very useful for the use of appropriate FL reading strategies.

Although no strong correlation was found between FL reading strategy use and performance on different measures, it is possible that employment of FL reading strategies may lead ESP learners to be more successful on language tests. As Bachman & Palmer (1996) states language learners need to have strategic competence to be more successful on language tests; hence, awareness on the role and importance of using effective reading strategies is required. Another implication of this study is to help learners become aware of their existing FL reading strategies and the other strategies that would bring them success in their academic studies. To foster such awareness, instruments like the one used in this study (SORS) may be administered to the students. Furthermore, tasks and strategy tips can be provided to learners for the employment of effective and appropriate FL reading strategies. Martinez (2008) pinpoints that if students are not aware of their own FL reading strategies, they cannot adopt effective strategies to deal with academic texts in ESP contexts. Thus, the first step in strategy instruction may be to help learners realize the importance of FL reading strategies.

As a consequence, this study revealed the FL reading strategies of ESP students in a Turkish context and tried to shed light on the relationship between these students' FL reading strategy use and their performance on reading proficiency and achievement tests. In order to help these learners become more successful and get the pleasure of reading while reading academic materials, the importance of FL reading strategies is highlighted. Further studies can be designed by using qualitative data collection instruments such as learner diaries or think aloud protocols to investigate the same phenomena.

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