The Impact of the Explicit Instruction of the Frequent Grammatical Patterns of ESM Written Discourse on ESP Students’ Reading Comprehension

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Abstract
It is hypothesized that in English for Specific Purposes (ESP) context, providing readers with some knowledge about structural patterns and grammatical features of the corresponding academic or occupational discourse may enhance comprehension of ESP texts. This study aimed at identifying the most frequent grammatical features of English for the Students of Medicine (ESM) written discourse and the possible impact of the explicit instruction of them on medical students’ reading comprehension performance. To this end, first, fifty paragraphs were randomly selected from medical and general English textbooks to identify the most frequent grammatical elements of ESM texts compared with non-ESM texts. Then, two homogenous groups of medicine students – an experimental and a control group – participated in the instructional procedures for this study. The former received explicit instruction of the identified structural features, while the latter was just exposed to conventional ESP reading instruction. Right after the instruction, the performances of the two groups were compared through administering an ESP reading comprehension posttest. The findings were indicative of the significant effect of explicit instruction of grammatical features of ESM texts on students’ reading comprehension. Further, the results attested to a high correlation between the subjects’ General Language Proficiency (GEP) and their ESP reading comprehension performance.

Key words: ESP reading comprehension, ESM discourse, explicit grammar instruction, EAP register analysis, GEP and ESP reading.

Introduction
Over the last four decades, Teaching English as a Foreign or Second Language (EFL/ESL) has been greatly influenced by the educational
requirements and objectives. The shift in education towards taking the learners and their needs into account (Clark, 1987; West, 1994), resulted in some modifications in English Language Teaching (ELT) curriculum which, in turn, led to the emergence of English for Specific Purposes (ESP) (Widdowson, 1983; Hutchinson & Waters, 1987; Robinson, 1991; West, 1998). ESP is considered as an efficient approach to language teaching since it is highly responsive to the learners’ needs for making pedagogical decisions concerning content, form, and methodology (Hutchinson & Waters, 1987).

From its inception in the 1960s, English for Specific Purposes has developed in diverse directions. One major branch of ESP is known as English for Academic Purposes (EAP). Examples include English for students of medicine, engineering, economics and so on.

Probably, the most needed skill in ESP worldwide, especially in academic contexts, is reading comprehension (Jordan, 1997). A possible reason for this is the increasing number of English textbooks and reading assignments at the university level (Swales, 1985). Typically, large amounts of academic information are presented to the learners through written discourse. Indeed, in many parts of the world, proficient reading in a foreign language is crucial to academic studies, professional success, and even personal development (Rivers, 1981; Alderson, 1984; Chastain, 1988; Bloor, 1998; McDonough, 1998).

Reading is an active process involving strategies that can be learned through instruction (Carrell, 2000). According to the non-sequential process models of reading, comprehension is the outcome of an on-going interaction among readers’ general and topical background knowledge, general language proficiency, context factors, and so on (Urquhart & Weir, 1998).

The previous research findings indicate that EFL readers typically fall short of perfect degrees of comprehension because they lack an appropriate schema (formal or content) or fail to activate it while reading a text (e.g. Carrell, 1984, 1987). More specifically, in some cases, the problem of poor reading performance in a second language seems to be due to the lack of knowledge of words and syntactic structures. For example, Yorio (1971) claims that the reading problems of foreign language learners are due largely to imperfect
knowledge of the language as well as native language interference in the reading process. Therefore, as Eskey and Grabe (1988, p. 229) maintain, “reading requires a relatively high degree of grammatical control over structures that appear in whatever readings are given to L2 students”.

It is commonly agreed that each specialist or professional text embodies specific and distinctive linguistic and discourse features (Swales, 1985). For instance, medicine language may prove different from literature in terms of the kind and frequency of certain features. Consequently, to comprehend the specialist texts, efficient readers should gain a good grasp of these features so that they may decipher the codes more economically. By the same token, in ESP reading, course design, and materials development, more attention should be paid to the grammatical elements typical of the specific texts.

A debatable issue in ESP reading is how far knowledge of the topic can compensate for linguistic difficulties in reading a text. The research findings documented by Clapham (1993) reveal that, as it might be expected, subject knowledge does have a role to play. However, work on language aspects of the text is still clearly of utmost importance because the linguistic features of a text vary according to the subject areas.

Jordan (1997, pp. 228-230) considers academic text analysis at various levels including discourse analysis, genre analysis, and register analysis. Discourse analysis is concerned with describing the structure of longer stretches of spoken or written texts. In Genre analysis, it is assumed that the members of a class of communicative events share some sets of communicative purposes. Genre analysis, then, aims at describing how the communicative purpose of a text is realized in its rhetorical organization and linguistic features (Swales, 1990). In Register analysis, statistical analysis is conducted on, for example, verb tense frequencies and vocabulary items for different subject areas in order to identify the specific grammatical and lexical features of those registers. The ESP course designers, materials developers, and teachers, then, concentrated on the sentence-level characteristics of the types of English identified as useful to the
students and organized the grammar-based curricula around the features of the corresponding registers.

This study attempted to investigate the existence of the highly frequent and distinctive structural patterns of ESM compared with non-ESM written texts and the probable impact of the explicit instruction of those patterns on ESM students’ reading comprehension. To this end, the following questions were formulated:

1. Are there any significant differences in the frequency of grammatical patterns in written ESM compared with non-ESM written discourse?
2. Is there any impact of explicit instruction of frequent grammatical features of ESM texts on ESP learners’ reading comprehension performance?
3. Is there any correlation between students’ General English Proficiency (GEP) and their ESM reading comprehension ability?

Based on the proposed research questions, the following null hypotheses were posed:

1. There is no significant difference between the grammatical patterns of written ESM and non-ESM discourse.
2. There is no effect of the explicit teaching of grammatical features of ESM texts on students’ reading comprehension performance.
3. There is no correlation between students’ GEP and their ESM reading comprehension ability.

Method

Subjects

This study was conducted with a random sample of 68 male and female students majoring in medicine at Tabriz University of Medical Sciences. The subjects were divided into two groups; the experimental and the control group. The experimental group was taught the prominent grammatical features of the ESM written texts explicitly while the control group only received the conventional instruction.
Materials and Instrumentation
Initially, a random and representative corpus of paragraphs from a wide number of medical textbooks and articles as well as general English textbooks were compiled in order to identify the most prominent grammatical features of medical discourse.

Also, a GEP test & an ESP reading comprehension test were constructed in order to ensure the homogeneity of the experimental and control groups prior to the treatment. The GEP test consisted of grammar, vocabulary, and reading comprehension subcomponents. The main goal of the ESP test was to determine the database for the students' reading comprehension ability in ESM texts. A multiple-choice format was decided mainly for objectivity and face value reasons.

A second ESP reading comprehension achievement measure was constructed and employed as posttest in this study in order to examine the effect of treatment. Both pre and post ESP tests were piloted before administration. An IELTS test (version 1999) functioned as the criterion measure for validity estimation. Reasonable validity indices were obtained for the pretest \( r = .86 \) and the posttest \( r = .78 \). The reliability estimates of the tests, as checked against KR-21 formula for internal consistency, were .67 and .72 for the pretest and posttest, respectively.

Procedures
To accomplish the purposes of the present experimental investigation, certain procedures were implemented. First, as mentioned above, a large corpus of paragraphs from medical written discourse as well as general English texts was selected randomly to analyze the texts and identify the prominent grammatical patterns typical of ESM texts. The most frequent categories of structures in these texts as confirmed by the results of Chi-Square analyses were *it* clauses, *passive* verbs, *reduced adverb* clauses, *modifiers* & *qualifiers*, and *reduced adjective clauses*.

Second, after ensuring the homogeneity of the groups in terms of
GEP and ESP reading comprehension ability, an instructional phase was planned and implemented based on the above structural patterns for the experimental group in this study. It consisted of five modules which highlighted and exemplified the grammatical features. Further practice activities were incorporated in order to help subjects figure out the functions of these grammatical patterns. The treatment took ten sessions. In order to nullify the contaminating effect of other potential factors, the teacher, the schedule, and the textbook were controlled in this study. Immediately after the treatment, the ESP achievement test was administered to both groups in order to examine the possible effect of the treatment.

Results
To probe the null hypotheses formulated earlier in this study, the data were analyzed using both descriptive and inferential statistics. The first research question of this study was concerned with the possible existence of the prominent grammatical features of ESM texts compared with non-ESM texts. To this end, the frequencies of various patterns of ESM and non-ESM texts were tabulated and put to a Chi-Square test (see Table 1).

<table>
<thead>
<tr>
<th>Grammatical</th>
<th>ESM</th>
<th>Non-</th>
<th>X2</th>
<th>d.f</th>
<th>Critical</th>
<th>P (Sig)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Adv.</td>
<td>33</td>
<td>13</td>
<td>10.63</td>
<td>1</td>
<td>3.84</td>
<td>*</td>
</tr>
<tr>
<td>Passive Verbs</td>
<td>52</td>
<td>16</td>
<td>19.05</td>
<td>1</td>
<td>3.84</td>
<td>*</td>
</tr>
<tr>
<td>Reduced Adj.</td>
<td>35</td>
<td>11</td>
<td>9.69</td>
<td>1</td>
<td>3.84</td>
<td>*</td>
</tr>
<tr>
<td>Modifier</td>
<td>333</td>
<td>86</td>
<td>145.6</td>
<td>1</td>
<td>3.84</td>
<td>*</td>
</tr>
<tr>
<td>Qualifier</td>
<td>65</td>
<td>27</td>
<td>15.69</td>
<td>1</td>
<td>3.84</td>
<td>*</td>
</tr>
<tr>
<td>It-Clauses</td>
<td>26</td>
<td>4</td>
<td>16.13</td>
<td>1</td>
<td>3.84</td>
<td>*</td>
</tr>
</tbody>
</table>

P<.05

As Table 1 indicates, the X2 observed values for all grammatical patterns exceed the critical values at .05. Thus, there is a significant difference between ESP and non-ESP texts in terms of frequency of grammatical patterns under study. The results, then, reject the first null hypothesis and provide a positive answer to the corresponding research question pursued in this study.
As mentioned earlier, a prerequisite condition for this study was to ensure the homogeneity of the subjects in the control and experimental groups. To this end, the mean scores of the two groups on the GEP test as well as the ESP measure were compared to see if there were any statistically significant differences between the groups at the outset of this study. Tables 2 and 3 summarize the results of the corresponding t-tests.

Table 2. t-test for GEP pretest scores

<table>
<thead>
<tr>
<th>Groups</th>
<th>X</th>
<th>SD</th>
<th>T</th>
<th>p</th>
<th>df</th>
<th>t.critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>5.02</td>
<td>1.89</td>
<td>.221</td>
<td>826</td>
<td>66</td>
<td>2.00</td>
</tr>
<tr>
<td>Control</td>
<td>5.12</td>
<td>1.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. t-test for ESP pretest scores

<table>
<thead>
<tr>
<th>Groups</th>
<th>X</th>
<th>SD</th>
<th>T</th>
<th>p</th>
<th>df</th>
<th>t.critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>13.58</td>
<td>2.89</td>
<td>.982</td>
<td>.33</td>
<td>66</td>
<td>2.00</td>
</tr>
<tr>
<td>Control</td>
<td>12.91</td>
<td>2.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As the results depict, the t-observed values in both comparisons fail to exceed the corresponding t-critical values for two-tailed tests at the .05 level of significance. So, it can safely be concluded that both groups performed homogenously on the GEP and ESP tests and that there was no statistically significant difference between them prior to the treatment.

In order to probe the second research question in this study dealing with the possible effect of the explicit instruction of the ESM prominent grammatical patterns on the subjects’ ESP reading comprehension performance, the mean scores of the two groups were compared through the t-test statistic (See Tables 4 & 5).

Table 4. Descriptive Statistics for ESP posttest

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>34</td>
<td>14.47</td>
<td>3.34</td>
<td>11.16</td>
</tr>
<tr>
<td>Control</td>
<td>34</td>
<td>11.50</td>
<td>3.23</td>
<td>10.43</td>
</tr>
</tbody>
</table>
As Table 5 indicates, the mean score of the experimental group in the posttest is higher than that of the control group. Again, through the application of an independent t-test, the difference was statistically explored (Table 5).

<table>
<thead>
<tr>
<th>Groups</th>
<th>X</th>
<th>SD</th>
<th>T</th>
<th>P</th>
<th>df</th>
<th>t.critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>14.47</td>
<td>3.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>11.50</td>
<td>3.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Taking into account the t-observed value in Table 6, it can be concluded that the experimental group performed differently on the posttest. That is, the t-observed value of 3.72 exceeds the t-critical value of 2.00 for a two-tailed test at the .05 level of significance with 66 degrees of freedom. It is, thus, concluded that as a result of having taught the identified prominent grammatical features of ESM to the experimental group, the reading performance of this group improved significantly. Thus, the results reject the second null hypothesis at the .05 level and provide the positive answer to the second research question.

To answer the third research question of this study examining the correlation between students’ GEP and their ESM reading comprehension performance, the correlation coefficients were estimated through correlating the ESP reading comprehension scores with the general English scores. Table 6 indicates that there are high positive correlations between the ESP reading comprehension performance and general English proficiency. This implies that the students’ general English proficiency has got a decisive role in predicting their success in ESP courses. Therefore, the third null hypothesis is also rejected at the .05 level of significance.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Correlation coefficient (ESP pre test scores &amp; GEP scores)</th>
<th>Correlation coefficient (ESP post test scores &amp; GEP scores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>.66</td>
<td>.79</td>
</tr>
<tr>
<td>Control</td>
<td>.77</td>
<td>.69</td>
</tr>
</tbody>
</table>
Discussion
The results of the present study strongly support the existence of the distinctively frequent grammatical features in ESM written discourse compared with non-ESM texts. The findings are compatible with some of the empirical studies conducted earlier in order to identify the linguistic features unique to certain varieties or registers of English (Herbert, 1965; Ewer & Latorre, 1969; Tarone et al., 1981, to cite a few). In addition, the explicit instruction of the frequent grammatical features of the register under study proved to facilitate the reading comprehension performance of the treatment group. As Dudley-Evans & Johns (1998) put it, there are many misconceptions about the role of grammar in ESP teaching, and indeed, it is often said that ESP teaching is not concerned with grammar. They further suggest that although the role of grammar is not central, it is incorrect to totally ignore it in the ESP teaching programs. Therefore, the findings of this study support Dudley-Evans & Johns’ claim concerning the contribution of the structural knowledge to successful ESP reading comprehension. Finally, the results obtained depict the highly significant correlation between student’s GEP and their ESM reading comprehension performance. In other words, the students’ GEP has a crucial role in their comprehension of specialized reading texts. These results are also congruent with the previous observations (Tan, 1990; Clapham, 1993, 1996; Biria & Tahirian, 1994; Atai, 2000, 2002).

Conclusion
The results of this study supported the existence of some prominent grammatical features in the ESM texts as well as the positive effect of incorporating these structures in ESP reading courses. The findings may promise certain theoretical and pedagogical implications. That is, ESP syllabus designers and materials producers may help ESP instructors to overcome the possible inadequacies of some of the current educational programs with a typically exclusive focus on content. More specifically, the textbooks for ESM’ students should contain well-sequenced training exercises on grammatical features of the corresponding academic texts so that the students may develop
appropriate formal schemata about the microstructure of discipline-
specific discourse. Another straightforward implication of this study is
that the ESP students should be exposed to the kind of text reflecting
the actual structures as documented in the learners' linguistic needs
proficis.

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References
problem or a Language problem?, in J. C. Alderson & A. H.
Urquhart (Eds.), Reading in a foreign language (pp. 1-21).
London: Longman.
EAP in Iran. Unpublished Ph.D. dissertation, University of Isfahan,
Isfahan, Iran.
comprehension course for the students of dentistry. Indian Journal of
Biria, R. & Tahririan, M.H. (1994). The methodology factor in teaching
Species some notes on a recently evolved species & on the
contribution of John Swales to its preservation & protection.
English for specific purposes, Vol. 17(1), 47-66.
TESOL Quarterly, Vol. 21(3), 461-481.
language Teacher Online. URL: http://language.hyper.chubu.ac.jp/fjalt/pub/tilt/98/mar/carrell/html
Chapelle (Eds.), A new decade of language testing research (pp. 257-271). Washington, DC: TESOL.


