An investigation of reading comprehension program at a University of Technology

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Abstract

This study aimed to investigate the reading comprehension program at a University of Technology to understand whether the ESP course affects students’ reading comprehension ability or not. To gather subjects, an OPT test was administered to 100 students bringing out 60 students in intermediate level of English proficiency. The participants were divided randomly into two groups of control and experimental. Then a pretest on reading comprehension was administered to insure the homogeneity of subjects and record what degree of implicit knowledge of comprehension they had. After treatment process which lasted for five sessions of teaching reading strategies, posttests were administered to subjects in order to understand whether they have progressed or not. The gathered data from subjects in both control and experimental groups were analyzed using independent samples t-test and ANCOVAs with the help of SPSS software. The data analysis revealed that the null hypothesis of the study is proved. Results indicated that learners who received reading comprehension strategies progress were more in contrast to those who did not receive the strategies in control group. The progress in experimental group was significantly different from the control group.

Keywords: Educational program, EFL learners, ESP, Reading comprehension

Introduction

English the language of worldwide communication and commercial exchange is being viewed on as one of the most useful subjects in educational curriculum. So many attempts have been made to devise the most efficient and effective ways of teaching English; as result, much greater time is now spent on learning English than any time before.

Swales (1987) believes that learning English is considered as the most predominant medium of scientific discussion. Hawkins & Pea (1987) regarded that learning and reading in English is actually a process of initiation into new culture, a transition from the culture of everyday thinking to that of formal science. This process, initiate into a new culture, however is not assumed to be just a matter of learning new concepts and facts, but is also the acquisition of linguistic and communicative competence which enables the learners to understand scientific discourse. During the last few decades, there has been a marked shift in the focus of language instruction towards the needs of individual learners and their responsibilities in second language learning. They are becoming less dependent on the teacher and more autonomous to diagnose their own learning strengths and weaknesses (Tarone & Yule, 1989, cited in Jamshidi & Yazdani Moghaddam, 2013). Reading comprehension is believed to be one of the most useful and important skills for the educated body in general, and for university students in particular. It is useful because most students at the college level obtain bulks of information about their major fields of study through reading (Farhady & Mirhasani, 2003).

Since the purpose of all reading is to gather meaning from the printed text, the ultimate goal of reading is comprehension. If a student says words
in a passage without gathering their meaning, one would hesitate to call that ‘reading’. It is not adequate to simply decode word meaning to comprehend a reading text. To achieve comprehension in reading skill, a reader should be able to successfully implement such practices as relating the text with his or her own background knowledge, summarizing information, drawing conclusions, and posing questions at the text; to overcome reading problem, allotting a certain amount of time to reading may be highly effective in increasing reading success (Susar Kirmizi, 2010).

Current survey has been established to determine the effect of ESP on the reading comprehension of engineering students in a university of technology in Tehran.

**Theoretical framework**

Hutchinson & Waters (1987) believe English for specific purposes (ESP) is an approach rather than a product which means ESP does not involve a particular kind of language, teaching material or methodology. In other words, he believes the foundation of ESP is the simple question: “Why does this person need to learn a foreign language?” The theory and practice of ESP was also challenged by some other authors. Corbluth (1975) believes that ESP courses are not so much instructive and useful as English for General Purposes. He believes that the primary need is to gain an adequate command of the basic syntax and essential vocabulary of the target language. In other words, he assumed that teaching and learning of “common core” proves more effective. Reading is one of the four major skills in learning a foreign language and the one that provides the students with the best opportunity of being in contact with English after education (Rostami Charvade, et al, 2012), which is tied with ESP. “Reading comprehension is the application of a skill that evolved for other purposes (listening or oral comprehension) to a new form of input (text)” (Kirby, 2006, p. 1). “The key defining feature of ESP is that its teaching and material are founded on the results of need analysis” (Carter & Nunan, 2001, p. 131).

Hutchinson & Waters (1987, cited in Kaewpet, 2009) offer a learning-centered approach to ESP in which argued that other approaches give too much attention to language needs, whereas more attention should be given to the learning style of learners. He believes that a learning needs approach is the best route to convey learners from the starting point to the target situation. Learner needs are approached from two directions; target needs and learning needs. Target needs are defined as “what the learner needs to do in the target situation” (Hutchinson et al, 1987, p. 54, cited in Kaewpet, 2009). The second focus in this approach is on learning needs, referring to numerous factors, including who the learners are, their socio-cultural back-ground, learning background, age, gender, background knowledge of specialized contents, back-ground knowledge of English, attitudes towards English, attitudes towards cultures of the English speaking world and studying English. Researchers insist on considering learners’ back-ground knowledge from the outset of the teaching and learning process and the use of authentic materials to encourage students to face the complexity of authentic texts was supported (Kaewpet, 2009).

There are characteristics of ESP which Dudley-Evans & St John (1998) distinguish between as absolute and variable characteristics as follow:

**Absolute Characteristics:**
- ESP is designed to meet specific needs of the learner.
- ESP makes use of underlying methodology and activities of the disciplines it serves.
- ESP is centered on the language (grammar, lexis, and register), skills, discourse and genres appropriate to these activities.

**Variable Characteristics:**
- ESP may be related to or designed for specific disciplines.
- ESP may use, in specific teaching situations, a different methodology from that of general English.
- ESP is likely to be designed for adult learners, either for a tertiary institution or in a professional work situation. It could, however, be used for learners at secondary school level.
- ESP is generally designed for intermediate or advanced students.

Most ESP courses assume basic knowledge of the language system, but it can be used with beginners.

To Carter & Nunan, “depending on the perspectives of different fields of study, it is possible, broadly speaking to see reading as practice, product or process” (2001, p. 21). Viewing reading as practice has been the interest of anthropologists and
social psychologist whose concern is with reading and writing practices as linked to their uses in early life not merely within schooling. The product view of reading, focuses on the form and meaning of written texts and their constituent parts while the process perceptive pays relatively greater attention to the role of the reader in the ongoing processing of written language and the strategies that she or he draws on in constructing meaning from form (Carter & Nunan, 2001). In other words, in product oriented approach, pre-reading activities rely mostly on clarifying the meaning of difficult words or complex structures. Whereas, for the process oriented approach to reading, meaning is obtained through a successful interaction between the reader and the text, and it is inside the head factors that play an important role in comprehension process (Ajideh, 2003).

**Statement of the problem**

In 1957, the United Nations Educational, Scientific and Cultural Organization (UNESCO) reported that nearly two-thirds of engineering literature published in English but more than two-thirds of the world’s professional engineers were unable to read English (Pritchard & Nasr, 2004). In order to overcome this problem, EFL in general and ESP in specific gained more attention in different educational contexts around the world.

One of the most serious problems in education, which usually does not receive the attention neither by students nor by teachers is the problem of reading (Dreyer & Nel, 2003), consequently many students experience academic failure because of their misinterpretation of the texts (Cakir, 2008). Iranian students also have this skill problem. They take longer time to read an English passage and consequently comprehend less, because they have never been taught how to read rapidly in their own language. On the other hand, in teaching reading as the objective of ESP syllabus, the teacher focuses merely on reading and considers in his legitimate right to resort to any possible way to enable the students to learn and improve the desired skill (Jalilehvand, 2012).

Also according to a report published by National Center for Educational Statistics in 2005, the scores on achievement tests in L2 reading comprehension classes in EFL contexts indicate that students are not performing well (Anderson, 2007). A majority of students, even those with strong reading skills, do not like to read a reading passage, recall it and answer its questions. It is the fact that most EFL students have difficulties in comprehending the texts in their subject matters. These problems result from lack of sufficient command of various types of general and technical vocabulary (Soltany, 2000).

The present study aimed to investigate the effect of educational program as ESP on the reading comprehension of EFL students in a university context. The main purpose of this study was to answer whether educational program would enhance reading comprehension ability in Iranian EFL learners at university level.

**Research question of the study**

This study intended to investigate the effect of educational program on the reading comprehension of Iranian EFL students; In order to achieve the purpose of this study the following research question was proposed:

- Does the educational program affect Iranian EFL learners’ reading comprehension ability?

**Hypothesis of the study**

H: The educational program does not affect Iranian EFL learners’ reading comprehension ability.

**Review of the literature**

The rapid exchange of information and research on common global problems caused English become a reliable source of technical progress as it enables specialists from different countries use this language to share and exchange information (Popescu, 2012). ESP has for about 30 years been a separate branch of English language teaching and has developed its own approaches, materials and methodology which is generally seen as a very active even “feisty” movement that has had considerable influence on TESOL and applied linguistics (Carter & Nunan, 2001).

To this end language teaching has undergone several changes and developments. The motive behind such studies and experiments which conducted recently is to address the variables which may affect or facilitate the process of second language learning. Findings have shown that emphasis on the learners’ needs, purposes, interests and motivation as well as background knowledge can greatly
influence the process of second language comprehension (Avand, 1994).

By reading in depth around a particular subject area, students experience marked growth in background knowledge (Dubin & Bycina, 1991). Learning by doing activities help students extract meaning from texts by using note-taking skills, following directions. Solving problems set up in the text and similar methods. By manipulating the data, learners gain more experience with the language as well as with the underlying organizational systems presented in the material (Alemi & Ebadi, 2010).

Many studies have been investigated around the topic in realm of ESP and programs designed for science students in universities. Alemi & Ebadi (2010) investigated the effects of pre-reading activities on ESP reading comprehension of EFL learners of science and technology majors in Iran. They revealed that pre-reading activities result to better comprehension while giving prior information through these activities act as a useful tool for ESP teachers to facilitate the learner’s reading comprehension ability. Due to the existence of problem in reading comprehension in EFL context, there are many works that have been done on issue in EFL context. On account of the significance of reading as the most generally needed skill in English for Academic Purposes and as a prerequisite for academic studies and personal development, research indicates, this superficially simple skill has been one of the most conversational issues in English Language Teaching in general and TEFL in particular (Soltany, 2000). Furthermore, Soltany (2000) claimed that a giant-sized corpus of written texts in EAP and generally in EFL doubles the importance of reading comprehension and this significance has resulted in a large number of studies into the nature of reading comprehension on the one hand and efficiency of readers in the processes of reading on the other hand.

According to Popescu’s study (2012) on teaching ESP for EFL students namely electronics and telecommunication students; even if the vast majority of students recognize most of the vocabularies and terms used in the materials, they have problems and difficulties in reading them because reading is an active process. When students read, do not merely sit as passive receiver of the text; students draw their own attention on knowledge of the world and of language to help guess what the text will say. It is only if we are reading a series of words that makes no sense at all such as: “Man walking elephant the onto reading o help” (Doff, 1988).

### Methodology

#### Participants
The participants of this study were 60 Iranian male students of computer engineering in their second year of study with the age range 20-25, who were selected randomly from among 100 learners in a University of Technology in Tehran based on the results of an OPT administered. Since the problem of reading comprehension is targeted, the 60 participants had to be representative of the intermediate level of English proficiency. The 60 participants were then divided into two groups and were randomly assigned to the control group as well as the experimental group.

#### Materials
For data collection purposes and treatment the following material were used:

- Oxford Placement Test: the paper-pencil OPT (version 1) was used to select homogeneous groups of students as subjects of the study in terms of English language proficiency.
- Reading comprehension test: A test of English reading comprehension in level of intermediate which was copied from Cambridge examination papers, administered to both groups -control and experimental- as pretest; also the test itself used as posttest too.
- Reading Comprehension Boosters: Five lessons from book titled “Reading Comprehension Boosters” written by Gunning (2010) were selected as the treatment material to be taught in the experimental group.

#### Procedure
The OPT administered to 100 computer engineering students at a University of Technology in order to select 60 participants. The OPT was scored on the basis of the standard criteria introduced by the test itself. Next, the pretest of the study distributed to 60 participants to be filled out in 30 minutes. Then the treatment of the study only for experimental group was started which was 5 sessions of teaching reading comprehension strategies according to Reading Comprehension Boosters book. The lessons as material provide brief, easy-to-read selections so that students could devote their full mental energies to learn the reading strategies. The focus of the selected materials was on developing comprehension skills and strategies. The strategies once learned, could be applied to more challeng-
To determine subjects’ progress on the total comprehension at the end of the treatment the test which used as pretest used as posttest too. The criterion for scoring the pretest and the posttest of the study was the maximum of 20.

**Data analysis and findings**

In this study the data collection process lasted about 3 months, and then the data were analyzed by applying Independent Sample T-Test and ANCOVAs to provide an answer to the research question. To analyze the data, two groups’ posttests results were compared and analyzed by Independent Sample T-test to show the groups mean difference. Also to determine the degree of the progress of two groups from pretest to posttest, two ANCOVAs coefficient were calculated.

**The Descriptive Analysis of the Data**

This section focused on the descriptive analysis of the obtained data in this study. The analysis was done using the SPSS software. Table (1) shows the descriptive analysis for the pretest and the posttest scores of participants reading comprehension ability in the control group of the study.

<table>
<thead>
<tr>
<th>Test</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Missing values</th>
</tr>
</thead>
<tbody>
<tr>
<td>PreCo</td>
<td>30</td>
<td>10.5333</td>
<td>4.51613</td>
<td>20.395</td>
<td>0</td>
</tr>
<tr>
<td>PostCo</td>
<td>30</td>
<td>11.0667</td>
<td>5.00299</td>
<td>25.030</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1. Descriptive Analysis for the Pretest and the Posttest of Control Group of the Study

As table (1) indicates, the number of participants has been 30 in each experiment (PreCo=30; PostCo=30), and there has been no missing value (Missing Value=0.00) which means all selected participants participated in the study. The mean for the PreCo (pretest of reading comprehension) scores was shown to be 10.5333 (PreCo= 10.5333) as compared to the mean for the PostCo (posttest of reading comprehension) scores which was 11.0667 (PostCo= 11.0667). As for the standard deviations obtained for the control group, there seems to be more variability among the PostCo scores than the scores in the PreCo. This may give an image of the participants’ posttest scores being more homogeneous after finishing the ESP program.

Similarly, the descriptive analysis for the pretest and the posttest of reading comprehension in the experimental group of the study has been shown in table (2).

<table>
<thead>
<tr>
<th>Test</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Missing values</th>
</tr>
</thead>
<tbody>
<tr>
<td>PreEx</td>
<td>30</td>
<td>10.6667</td>
<td>5.28716</td>
<td>27.954</td>
<td>0</td>
</tr>
<tr>
<td>PostEx</td>
<td>30</td>
<td>14.5333</td>
<td>4.86885</td>
<td>23.706</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2. Descriptive Analysis for the Pretest and the Posttest of Experimental Group of the Study

As table (1) indicates, the number of participants has been 30 in each experiment (PreEx=30; PostEx=30), and there has been no missing value (Missing Value=0.00) which means that all selected participants participated in the experiment of the study. The mean for the PreEx (pretest of reading comprehension) scores shown to be 10.6667 (PreEx= 10.6667) as compared to the mean for the PostEx (posttest of reading comprehension) scores which was 14.5333 (PostEx= 14.5333). As for the standard deviations obtained for the experimental group, there seems to be more variability among the PreEx scores than the scores in the PostEx. This may give an image of the participants’ posttest scores being more homogeneous after conducting the treatment of the study (treating with reading strategies).

**Inferential Analysis of the Data**

This section focused on inferential analysis of the obtained data of this study that was calculated using SPSS, in which an Independent Sample T test was selected for calculating the t value and also ANCOVA (general linear model/ Univariate) for calculating the covariance.
Table 3. Independent Samples Test of the Study between 2 Posttests

<table>
<thead>
<tr>
<th>T test results</th>
<th>Observed t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances not assumed</td>
<td>2.720</td>
<td>57.957</td>
<td>.009</td>
</tr>
</tbody>
</table>

As table (3) is indicated, the t-value was calculated between the posttests of reading comprehension for participants in the control and the experimental groups. The observed t value was calculated as to be 2.720 (tobs = 2.720) and the degree of freedom was 57.957 (df= 57.957). The reason why the degree of freedom here was not calculated based on the common formula of (df= N-1) was that the SPSS calculated the degree of freedom while considering the variances of the participants posttest groups as unequal instead of equal (PostCo= 25.030 Vs PostEx= 23.706) see tables (1) and (2). At last, the level of significance was calculated as to be .009 (p=.009) which has been used in interpreting the data for the rejection or support of the hypothesis of the study in the next section.

The second type of inferential analysis of the data in this study is related to the degree of relationship between the pretest and posttest of reading comprehension ability of participants as a variable in both control and experimental group. In the case of calculating and showing the progress of groups from pretests to posttests, ANCOVAs (Covariance coefficient) were used as shown in table (4).

Table 4. The covariance table for the pretest and the posttest scores of the control and experimental groups

<table>
<thead>
<tr>
<th>Between pre and post tests of the experimental group</th>
<th>Between pre and post tests of the control group</th>
<th>Covariance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.756</td>
<td>.214</td>
<td></td>
</tr>
</tbody>
</table>

According to table (4), the covariance between the two sets of pretest and posttest scores in the experimental group is 1.756 while it is 0.214 in the control group of study. This means that the degree of statistical distance between the pretest and posttest scores in the experimental group is higher than the control group and is representative of the closeness of the scores in the pretest and posttest scores of the control group; consequently, it can be concluded that the control group of the study has no significant progress as a result of not being treated with teaching reading comprehension strategies unlike the experimental group.

Result of Hypothesis Testing

In this section the result of hypothesis testing is presented and explained. The question and hypotheses of study is remembered:

Q: Does the educational program affect Iranian EFL learners’ reading comprehension ability?

H: The educational program does not affect Iranian EFL learners’ reading comprehension ability.

The hypotheses of the study which connoted the educational program does not affect Iranian EFL learners’ reading comprehension ability is proved. Some evidences came to justify the proof of the hypothesis.

First, the result of T-test as shown in table (3) indicated that the observed t value is -2.720 in which the critical t value determined on the basis of considering the 2-tailed significance level of 0.05 is 2.000. Thus, the observed t was higher than the critical t and led to proof of aforementioned hypotheses.

The second evidence to verify the proof of the hypothesis was the value of the level of significance calculated by the SPSS to be .009 (Significance 2-tailed= .009). Since this value was lower than 0.05, the difference between the means of the posttests of the study could not be by chance, and indicated that teaching reading comprehension strategies enhanced the comprehension ability of the participants in the experimental group of the study.

The third evidence to verify the proof of the hypothesis of the study could be supported by showing the experimental group participants’ progress from the pretest to the posttest as table (4) supported. According to this table, the covariance value between the pretest and the posttest scores in the experimental group was higher than that of the control group. This means that the posttest scores of reading comprehension in the experimental group were distant from the pretest scores in same group which means teaching reading comprehension strategies affected the participants’ comprehension ability. In fact the control group had not any progress between 2 sets of tests.
Conclusions

In this study the experimental group was instructed the strategies of reading comprehension as pre-reading activity while the control group taught in a normal way lacking pre-reading activity. Both groups were taught technical jargon included in course book in which most of times had an equal equivalent in L1 and students were familiar to, based on their specialized studies. So maybe the most important issue in ESP program is that students should be aware of appropriate strategies to increase their recognition ability (comprehension) when confronted with new texts. ESP teachers’ job is to overcome this lack on students’ side.

Considering the data analysis provided in previous section, there was a significant progress in experimental group of the study from pretest to posttest. This remarkable progress was due to other factors than the educational program offered by the university; actually, the manipulation of program by implementing the reading strategies affected the learning style of learners in experimental group which is proved by calculation of T-test and observing the covariance value between the pretest and the posttest scores in groups.

The findings of the study indicated that offering the learners with strategies needed to cope with issues they will confront, could result in a better and remarkable reading comprehension. These findings are in agreement with studies carried out on the effect of learning strategies on reading comprehension skill that was done by Ahmadi Gilani et al (2012). He revealed that offering reading strategies to students significantly result in reading comprehension development. Also the findings of a study which carried out by Alemi & Ebadi (2010), revealed that giving prior information through restoring to pre-reading activities might become a useful tool for teachers of ESP to facilitate the learner’s reading comprehension ability. In a very similar study conducted by Deeb M. Albakrawi et al (2013), in Saudi Arabia, the researcher has found that the overall level of learners’ proficiency including all skills of language and in specific reading comprehension in ESP program for engineering students is affected due to manipulating and designing new syllabus in program.

Suggestions for future research

Research in educational program is not a single-sided phenomenon; it is multi-dimensional discipline that needs to consider many factors related to students and the context of learning, living and working styles. In fact there are numerous side-long topics to be considered on at least in terms of variables.

The population of the study is an issue that should be taken into the account. It is possible to have more participants in number to get more accurate data and information. In addition, this study has been limited to male students in a University of Technology. The other point is that the treatment period for introducing strategies might be insufficient in this study, it is possible to advocate more than five session of treatment to get a more remarkable result. Future studies, however, could be carried out with a set of different focuses in other fields of study or other colleges and universities in different parts of the world.

References


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