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# Needs-based course design: the impact of general English knowledge on the effectiveness of an ESP teaching intervention

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## Abstract

The paper presents an attempt to evaluate the effectiveness of the implementation of a needs-based approach to ESP course design in the context of Greek tertiary education and to measure the impact of the influence of pre-existing English knowledge in relation to the students' performance in ESP. Experimental research design was employed; the students' scores in the Oxford Placement Test and the pre- and post-tests were analyzed by means of ANOVA and ANCOVA. The post-intervention data revealed that the experimental group outperformed the control group in terms of total test scores even after adjustments were made by removing the learners' previous linguistic competence as measured by the OPT while between-groups comparison indicated statistically significant differences. The results thus, provide support for the efficacy of the adopted needs-based approach to syllabus design.

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*Keywords:* Effectiveness of course design; Performance measures; ESP; Needs-based syllabus;

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## 1. Introduction

The process of needs analysis has been established as a key concept of ESP course design, program implementation and evaluation (Brown, 1995; Dudley-Evans & St. John, 1998; Ellis & Johnson, 1994; Johns & Price-Machado, 2001; Jordan, 1997; Munby, 1978; Richards, 2001; Flowerdew & Peacock, 2001; Hamp-Lyons, 2001; Boshier & Smalkoski, 2002). The importance of data collection procedures aiming at the identification of the demands of the target and learning situation (Dudley-Evans & St. John, 1998; West, 1994, 1997) and the genres to be adopted (Bhatia, 1993; Molle & Prior, 2008) are widely acknowledged as essential stages for the development of ESP course design. In addition, the efficiency and effectiveness of ESP courses in higher education institutions have become high priority objectives over the past two decades following the trend towards ensuring quality in teaching (Byrne & Flood, 2003) and the demand for public accountability escalates (Buckley & Hurley, 2001). In effect, there are considerable benefits in evaluating the effectiveness of ESP courses to address the learners' identified purposes for using the target language (Jackson, 2005) as part of curriculum renewal.

Curriculum renewal or reform is most often introduced to realize expectations in terms of its potential to enhance the performance of students as a result of the shift in focus, the change of goals, content and teaching materials and

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methods. In effect, the issue of whether the new curriculum has the impact ascribed to it is raised, a fact which calls for a systematic evaluation of its implementation (Hopmann, 2003). Moreover, the challenge of designing and delivering a needs-based course can be identified in relation to its effectiveness as indicated by repeated measures of the students' performance. It was considered that since student learning is a valuable indicator of effective implementation of instructional goals (Norris, 2006), a properly developed evaluation of the students' performance can yield data adequately reliable and valid to measure the effectiveness of the course (Hobson & Talbot, 2001) and account for factors which are influential and affect the students' performance.

## 2. The Study

### 2.1. *The aim and objectives of the study*

The present study aimed to investigate the impact of the teaching intervention by measuring the outcomes of the implementation of an experimental syllabus in terms of students' performance concerning skills and vocabulary in order to establish the effectiveness of a needs-based approach to ESP course design. The experimental needs-based syllabus was developed on the basis of data emanated from the initial needs analysis project (Chostelidou, 2010) which included multiple sources of informants and research methods (Jasso-Aguilar, 1999) in order to ensure the validity of the data collected (Cresswell, 2003; Dörnyei, 2007). Its ultimate goal was to introduce curriculum renewal and optimise the quality of the ESP course offered. However, in consideration of the fact that ESP students come to the language classes with a certain amount of proficiency in general English as a result of the tuition received for some years in public schools and private institutes, it was regarded essential that the impact of a factor such as the learners' previous linguistic knowledge had to be controlled and measured in order to establish the efficiency of the implementation of the adopted ESP course. In particular, the following research objectives were set:

- a) to evaluate the effectiveness of needs-based ESP course design in terms of students' gains in total test scores;
- b) to measure the impact of the influence of the students' linguistic competence in general English on the students' mastery of subject-specific knowledge as indicated by their performance in the ESP test.

### 2.2. *The Participants*

The participants involved in the study were 286 Business English students of tertiary education in Northern Greece streamed into the experimental group (N=147), who were exposed to the needs-based syllabus and the control group (N=139), who were presented with the usual teaching approach for an academic semester. Their age range was 20-24 years. Also, their level of English language proficiency ranged from false beginner (38.7%) to upper intermediate (46%) and advanced (15.3%) for the experimental group as suggested by their scores in the Oxford Placement Test (OPT); the students in the control group were identified as false beginners (35.4%), upper intermediate (46.9%), and advanced (17.7%) respectively.

### 2.3. *Research methods and tools*

In order to measure the impact of needs-based course design experimental research design was employed including a factorial experiment with two factors: one factor between subjects (group, with two levels, experimental and control) and one factor within subjects with repeated measures (two levels, pre and post).

In the attempt to evaluate the effect of the teaching intervention on the students' performance concerning skills and vocabulary, two research tools were employed since testing is a technique commonly adopted as part of course evaluation (Graves, 2001). In particular, an ESP test instrument, which was specifically developed to reflect the objectives of the needs-based course and the syllabus, was used for measures prior and after the teaching intervention and was devised to all students in the experimental and the control group. In addition, the OPT was used to identify the students' linguistic competence in general English upon entering the course.

The focus of the pre- and post-test was to assess skills and vocabulary development through a variety of tasks, all designed with the intention of being fair to the test takers in the particular setting, which according to DeKeyser and Larson-Hall (2005, p.102) helps prevent a possible method effect. More specifically, the tasks reflected real-life professional and academic situations, as closely as possible given the constraints and the artificiality of the testing environment. The idea of ‘authenticity of task’ (Douglas, 2000; Bowles, 2006) was crucial throughout the test. The starting point for any task was a purpose of some kind for which a language user in the real professional or academic world would actually listen, speak, read, or write. Similarly, the texts used were selected in order to provide appropriate subject-specific input in line with the demands of such tasks.

Table 1. Test Format

Skill assessed	Number of tasks	Timing (approximate)	Weighting
Part 1. Reading	4	About 20 min	20%
Part 2. Vocabulary	3	About 20 min	20%
Part 3. Writing	1	About 30 min	20%
Part 4. Listening	4	About 15 min	20%
Part 5. Speaking	3	About 15 min	20%

In order to establish the reliability of the test, Cronbach  $\alpha$  coefficient was estimated and identified as 0.70 for the pre-test and 0.80 for the post- test aggregated for both groups, figures which are regarded acceptable and satisfactory as in general, acceptable reliability indexes range from 0.70 and above (Nunally, 1978). Moreover, a high degree of agreement was recorded between the two raters in evaluating the students’ written texts and oral output by means of the IELTS bands. The three correlation-agreement indexes, Pearson’s  $r$ , Spearman’s  $\rho$ , Kendal’s tau  $b$ , were 0.954, 0.922, 0.871, all exceeding 0.800 and therefore statistically significant ( $p < 0.001$ ) (Gwet, 2008), which suggest a high inter-rater reliability for writing and speaking tasks.

#### 2.4. Data analysis

Total scores obtained from the pre- and post-test measures were analyzed for statistical difference by means of ANOVA (Analysis of Variance) and ANCOVA (Analysis of Covariance). The independent variables were the experimental and control group at the pre- and post-intervention. The dependent variables were the subjects’ mean scores in pre- and post-tests while OPT scores were treated as a covariate. Means and standard deviations as well as F-ratios were calculated. Comparisons of means were performed using the Least Significant Difference criterion (LSD). The significance level was predetermined at  $\alpha = 0.05$ . All analyses were performed with SPSS v. 15.0.

### 3. Findings

#### 3.1. The effect of the teaching intervention on students’ performance in terms of total score in the ESP test

The students’ total scores in the test were analyzed for statistical significance by means of ANOVA which indicated that there is statistically significant interaction between the experimental and control group ( $F(1,284) = 68.753, P < 0.001$ ) at the pre- and post-intervention stages as a result of the teaching intervention. In particular, both the experimental and control group achieved statistically significant progress in terms of total test scores (Table 2), which is based on aggregated measures in reading, listening, writing, speaking and vocabulary sub-tests as a consequence of the tuition they had received for an academic semester. In fact, both groups attained considerable gains in total post-test over pre-test scores.

Table 2. Comparison of Pre- and Post-intervention measures per Group for total test score in all skills

Groups	Mean	Std Deviation	N
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Experimental	Total score Pre	42.7 <b>b</b> <b>A</b>	16.0	147
	Total score Post	59.9 <b>a</b> <b>A</b>	15.1	147
Control	Total score Pre	43.0 <b>b</b> <b>A</b>	14.1	139
	Total score Post	51.8 <b>a</b> <b>B</b>	14.4	139

\*For each stage, means followed by different lower case letters are statistically significant different, at significance level  $\alpha=0.05$ , according to the LSD criterion. \*\*For Pre- Post- comparisons, means followed by different capital letter are statistically significant different, at significance level  $\alpha=0.05$ , according to the LSD criterion.

In addition, as presented in Table 2, ANOVA showed that there was no statistically significant difference in the performance of the two groups at the pre-intervention measurement as the groups were equivalent in terms of performance in the baseline comparison. However, the post-intervention measurement indicated that the performance of the experimental group is statistically significant differentiated from the performance of their peers in the control group since they managed to attain a significantly higher mean score. Specifically, at the post-intervention measurement the experimental group attained a mean score of 59.9 out of 110 whereas the mean score of the control group was 51.8. In the baseline the means of both groups were 42.7 and 43.0 respectively. As a result, the experimental group showed more significant gains in post-test scores in comparison to the control group.

Moreover, the difference in mean scores for the measures from pre- to post-intervention for the experimental and control group was used to calculate the effect size of the teaching intervention which was estimated to  $0.676/0.341 = 1.98$  (ratio of partial eta squares) (Jaccard, 1998; Cortina & Nouri, 2000; Lipsey, 2001). Thus, the teaching intervention provided to the experimental group can be considered 1.98 times more effective in terms of mean scores than the established intervention provided to the control group.

### 3.2. *The effect of previous linguistic competence on the outcome of the teaching intervention*

For the purposes of controlling the effect of the learners' general linguistic competence on the outcome of the ESP course ANCOVA was employed to statistically remove the effect of the learners' pre-existing general English knowledge (Lynch, 1996) as this was measured by their performance in the OPT from their total scores in the ESP test. The procedure was considered essential in order to find out whether the effectiveness of the ESP teaching intervention in terms of total test scores which were established in the previous section was influenced and if so to which extent by the learners' general English competence. The results (Table 3) which compare the two groups, the experimental and control, at the pre- and post- level presented the learners' achievement in the ESP test after removal of the effect of OPT from the total scores, and indicated statistically significant progress in the performance of the two groups in effect of the training they were provided with. This outcome is in line with the formerly presented results which did not include the removal of the students' underlying general English knowledge. In this case, the mean scores are estimates which correspond to OPT score 36.8 from the total score of the test, 60.

Table 3. Comparison of Pre- and Post-intervention measures per Group for total Test score in all Skills

	Groups	Mean	Std Deviation	N
Experimental	Total score Pre	43.1 <b>b</b> <b>A</b>	16.0	147
	Total score Post	60.3 <b>a</b> <b>A</b>	15.1	147
Control	Total score Pre	42.7 <b>b</b> <b>A</b>	14.1	139
	Total score Post	51.4 <b>a</b> <b>B</b>	14.4	139

\*For each stage, means followed by different lower case letters are statistically significant different, at significance level  $\alpha=0.05$ , according to the LSD criterion. \*\*For Pre- Post- comparisons, means followed by different capital letter are statistically significant different, at significance level  $\alpha=0.05$ , according to the LSD criterion. \*\*\* Means are adjusted for OPT score= 36.81

Furthermore, statistically significant difference was recorded in the post-intervention measurement (Table 3) since the experimental group (mean score 60.3) was more effective than the control group (mean score 51.4) in

developing skills and vocabulary; it exhibited significant gains in post-test total scores over pre-test scores despite the fact that in the baseline comparison both groups were regarded of equal level with mean scores of 43.1 and 42.6 respectively and thus, were not statistically significant different.

The general conclusion which can be drawn is that previous knowledge or linguistic competence in general English correlates with the learners' performance in the ESP test; however, the findings remain in the same direction, as only minor changes in score range can be identified by performing this equation. This sustains the fact that irrespective of general English competence the experimental group outperformed the control group in terms of subject-specific knowledge and skills in effect of the focused ESP teaching intervention they were exposed to.

#### 4. Conclusion

The research data highlighted the success of the experimental teaching intervention as suggested by the learners' enhanced performance and indicated the significance of the needs-based approach to ESP course design (Cowling, 2007; Long, 2005; Dudley-Evans & St. John, 1998; West, 1997) towards optimizing learning conditions.

It should be noted that the students in the experimental group demonstrated better performance in test scores compared to their peers in the control group, who were taught in a traditional lexical-oriented, teacher-centered methodology. This fact underlines the effectiveness of the experimental syllabus in meeting the needs of the target group of learners as regards the provision of efficient training in skills and subject-specific vocabulary. Therefore, the experimental syllabus can be clearly regarded as having an impact on the students' mastery of subject-specific knowledge and skills through the provision of a focused approach which exposed them to a variety of discipline-specific tasks (Silva, 2004) serving both the students' immediate academic needs and long-term needs as professionals (Hutchinson & Waters, 1987) and reconceptualizing the link between the language classroom and the real world (Graves, 2008, p.417). Although it cannot be assumed of the students to have reached native like proficiency (Stern, 1983, p.341) in using the target discipline language at such a short period of instruction, they have made significant progress as indicated by the comparison of their mean scores before and after the teaching intervention of an academic semester. These scores provide evidence for the students having acquired considerable knowledge and become adequately competent in aspects of the target language in their field of study. Also, they are considered to have developed adequate fluency and accuracy to engage confidently in successful spoken and written exchanges for academic or professional purposes in effect of the focused training they were provided with.

Another issue of major importance, which is commonly identified in evaluation of language courses, was to sustain the effectiveness of the experimental teaching intervention despite the preexisting differences in language ability of the students (Lynch, 1996, p.101). All of them have attended English for General Purposes courses as part of their former schooling, a fact which is believed to potentially affect their achievement in ESP in some systematic way. Acknowledging that it is the specificity element which clearly distinguishes ESP from EGP courses (Hyland, 2002; Dudley-Evans, 1998), it was our aim to confirm the effectiveness of the ESP course in terms of its highly specific nature and establish its efficiency to address the subject-specific needs of the learners' concerning their target discipline. It should be noted that only a narrow change in the range of the adjusted post-test scores was identified after removal of the effect of the OPT, which was used to account for variability in the linguistic level of the students in general English upon entering the course. This step was considered essential on the grounds that the realization of a narrow angle ESP course with a distinct focus on the learners' subject field (Orr, 1998) was inevitably preceded by a sizeable background of general English. Repeated measures indicated that the achievement of the experimental group after the intervention remained significantly higher compared to the control group. Therefore, it can be said that the impact of the students' preexisting linguistic competence on the outcome of the ESP course was not largely influential and in consequence the effectiveness of the ESP teaching intervention in promoting mastery of discipline-specific content in the target language has to be put forward.

In conclusion, the development and implementation of the needs-based ESP course and the experimental syllabus can be regarded as highly effective in enhancing the learners' performance and promoting their achievement in ESP irrespective of their level of competence in general English at the beginning of the course.

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