

# Introducing Project-based Instruction in the Saudi ESP Classroom: A Study in Qassim University

Abdul-Aziz Saleh Alsamani<sup>1</sup> & Ayman Sabry Daif-Allah<sup>1</sup>

<sup>1</sup> Buraydah Community College, Qassim University, Saudi Arabia

Correspondence: Abdul-Aziz Saleh Alsamani, Buraydah Community College, Qassim University, Saudi Arabia.  
E-mail: alsamani2000@yahoo.com

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## Abstract

The aim of this paper is to study the impact of introducing an integrative pedagogical approach in the ESP classes on developing the English language vocabulary of Computer Science and Information Technology students in the College of Science, Qassim University. The study suggests a framework for an ESP course-design employing students' project work based on the analysis of learners' needs. The researchers made use of the experimental pre-test post-test control group design where the English vocabulary test was used as a pre and post test. The results reported from this study revealed the effectiveness of the suggested project-based ESP course on developing the English vocabulary for the target subjects. Also, the results show that project based instruction enhanced the teaching and learning of ESP and developed new study habits for learners by promoting self-directed, independent, cooperative learning as well as out-of-classroom learning. The study concluded with recommendations related to how projects can be incorporated into ESP classrooms to develop different language skills i.e. speaking, listening, reading, and writing.

**Keywords:** English for specific purposes, negotiation, problem solving, project-based learning, team-work

## 1. Introduction

Nowadays English language acquisition is a key that offers many chances for several professions. More and more groups of people feel the need to learn English to be updated with the recent developments imposed by the revolution in information in their specific fields of interests or career-related settings. This is English for specific purposes. Mamakou and Grigoriadou (2011) state that the traditional teaching of ESP has generally focused on the delivery of language information through reading comprehension, writing, vocabulary and grammar exercises neglecting the need to integrate it with skills. However, they believe that interactive teamwork, critical reading and writing, communication skills, negotiation, presentations are some of the vital soft skills for today's academic and future work environment. These skills could be developed through introducing an integrative pedagogical approach incorporating project-based learning (PBL) into ESP classes (Guo & Yang, 2012). This modern focus on student-centeredness in language learning has led many ESP instructors to investigate the benefits of involving learners in team-work and project-based activities (Noom-ura, 2013). Interest in PBL and its integration into foreign language instruction is increasingly growing around the world (Borza, 2013). According to Ushioda (2010), Stoller (2006) and Robinson (1991) this approach is particularly effective in English for specific purposes ESP settings because it lends itself to: (i) authentic language use, (ii) focus on language at the discourse rather than the sentence level, (iii) authentic tasks, (iv) learner centeredness, and (v) purposeful language use, all characteristics of ESP. A PBL approach enables students to develop and improve their language fluency and accuracy, and at the same time build personal qualities and skills such as self-confidence, problem-solving, decision-making, and collaboration (Little, 2009; Beckett & Slater, 2005; Fried-Booth & Diana, 2002).

Although the research on project-based Learning reports many positive outcomes related to student learning in the areas of content knowledge, critical thinking, and problem-solving, yet the literature on the implementation process is limited (Bradley-Levine et al., 2010). Thus, the researchers were encouraged to conduct the present study to examine the impact of integrating students' project work into ESP instruction on developing the English

language vocabulary of Computer Science and Information Technology Students at Qassim University.

## 2. Context of the Problem

Computer and information technology students at Qassim University are assigned to study four three-hour credit EFL courses throughout their academic instruction. The first course, entitled English language 1 focuses on developing the basics of the foreign language with emphasis on the structure of the language. The second course English language 2 is a continuation for the first one with emphasis on general scientific topics. These two three-hour credit courses are to be somewhat appropriate at the preparatory levels one and two. When the first researcher was asked to teach the third English course to the computer and information technology students, he found that the course book they have to study covers scientific topics related to different fields of study other than computer technology. The end product of such irrelevant course material is boring lessons and frustrated students who usually show disruptive behaviors by talking to each other during the course and not paying attention to the teacher. Therefore, the researchers found that the current course book taught to computer and information technology students in Qassim University doesn't serve learners' interests and needs (Note 1). It does not also help learners in their professional studies.

Results of the pilot study administered with students and staff revealed that students do not practice the language. They just memorize some structures with little or no practice of the language inside the classroom. The staff stressed the need for the design of an ESP course built on the student's needs and active involvement of the students. This idea is emphasized by Bradley-Levine et al. (2010) and Little (2009) who believe that the content of a realistically ESP course must be coherent with the needs and wants of the clients and that the contents should be technically, physically, and mentally conceivable and able to be implemented within the time allotted in the curriculum. Further, Baumgartner & Zabin (2008) found that foreign language learners generally need to be involved in their classes, because learner passivity and non-involvement will in fact sabotage the desired outcome. In this context, Noom-ura (2013) and Sysoyev (2000) point out that with the spread of the student-centered approach and the continued increase of the international contacts in various spheres, much attention should be paid to the design of ESP courses that can prepare students for professional development and communication.

## 3. Statement of the Problem

Based on the results of the pilot study and feedback gleaned from staff and students, it is evident that the current EFL course presented to computer and information technology students at the College of Science in Qassim University does not either reflect the learners' demands or help in developing their English vocabulary which is vital in their academic development and future career.

## 4. Research Questions

*The present study sought answers to the following questions:*

- 1) What are the English language needs of computer and information technology students at the College of Science in Qassim University?
- 2) What are the features of a designed framework for an ESP course based on students' projects?
- 3) What is the impact of the proposed framework on developing the English vocabulary related to the field of specialization for the target sample?

## 5. Hypotheses of the Study

*The study attempted to verify the validity of the following hypotheses:*

- 1) There are significant statistical differences between the mean scores of the experimental group in pre and post-testing of the English vocabulary test in favor of post-testing.
- 2) There are significant statistical differences between the mean scores of the experimental group students and the control group students in the post-testing of the English vocabulary test in favor of the experimental group.

## 6. Objectives of the Study

*This study aimed at:*

- a) Identifying the English language needs of computer science students at Qassim University in Saudia Arabia.
- b) Offering theoretical support for developing ESP courses for EFL students.
- c) Presenting guidelines for integrating project work into ESP courses
- d) Developing a framework for an ESP course for computer science students based on students' work.

## 7. Review of Literature

Recently, increasing number of language educators have shifted to project work as a means of promoting meaningful student engagement with language and subject matter in ESP classes. In this digest, relevant theory and research are presented to provide a conceptual framework for integrating students' project work into ESP instruction.

### 7.1 Definition and Characteristics of ESP

One cannot actually describe ESP fully because the term is more complicated than it seems to be and many new factors are being involved every now and then (Stapa, 2003). Hutchinson and Waters gave ESP a broad description as “an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning “(1987).

Dudley- Evans and St.John (1998) define ESP in terms of Absolute and Variable characteristics:

#### *I- Absolute characteristics:*

ESP is defined to meet specific needs of the learner;

ESP makes use of the underlying methodology and activities of the discipline it serves;

ESP is related in content (i.e. in its themes and topics) to particular disciplines , occupations and activities ;

ESP is centered on the language (grammar, lexis, register) skills, discourse, and genres appropriate to these activities.

#### *II- Variable characteristics:*

ESP may be related to or designed for specific disciplines;

ESP is likely to be designed for adult learners, either at tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level;

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

This definition is appropriate for the present study because it is based on knowing the goals of learners at all stages and stresses the importance of permanently conducting learners' needs analysis. The definition also indicates that ESP is so open to all learning purposes and able to use the suitable pedagogical style, appropriate materials and course design for each discipline and field of study more effectively. Also, the characteristics are carefully listed to eventually allow a compromising harmony in views about what ESP is and what is not.

### 7.2 Definition and Characteristics of Project Approach to Language Learning /Teaching

The project approach derives from Pragmatism which fosters action and practical application of knowledge in everyday life (Fried-Booth & Diana, 2002). It also promotes manual activity instead of memorization and verbalism (Fragoulis & Mega, 2009). In this regard, Kotti (2008) and states that the implementation of the project- based learning is based on the pedagogical principle of “learning by doing”, which means that learners acquire knowledge after having experienced or done something new.

Mergendoller and Thomas (2010) proposed a definition of PBL as being a teaching model that organizes learning around projects. These projects are generally complex tasks based on challenging questions or problems that involve students in designing , problem-solving, decision-making, and/or investigative activities, that give students opportunities to work relatively autonomously over extended periods of time, and culminate in realistic products or presentations. Larmer and Mergendoller (2010) describe project-based learning as a process whereby students work collaboratively to explore and learn content via authentic, problem-based projects essential to the curriculum.

Markham (2011) believes that project-based learning integrates knowing and doing through shifting the focus of education on the student, not the curriculum. Markham adds that project-based learning helps students to come up with high quality, collaborative products which are mainly activated through experience rather than taught out of a textbook. In the EFL field, project-based learning is considered as an important instructional approach that functions as a bridge between learning English in class and using English in real life situations, in particular in settings related to their specialization (Brush & Saye, 2008).

As an extended illustration, Stoller (2006) defined PBL as: (1) having both a process and product; (2) giving students (partial) ownership of the project; (3) extended over a period of time (several days, weeks, or months); (4) integrating skills; (5) developing student understanding of a topic through the integration of language and content; (6) students both collaborating with others and working on their own; (7) holding students responsible for their own learning through the gathering, processing, and reporting of information gathered from target-language resources; (8) assigning new roles and responsibilities to both students and teacher; (9) providing a tangible final product; and (10) reflecting on both the process and the product.

Similarly, Guo & Yang (2012) emphasize that PBL develops the inclusive ability of both teachers and students. For the teachers, their classroom behavior and daily teaching activities would be significantly improved through the participation in the project based teaching and learning activities. For the students, their group cooperation capacities, capacity for problem identifying, and problem solving all have grown and thrived. Brush and Saye (2008) indicate that PBL has a positive effect on increasing students' motivation and engagement in classroom activities. In addition, research indicates that PBL helped students develop their scientific investigation and creative thinking skills, build up opportunities to interact with their friends through cooperative projects (Doppelt, 2009; Baumgartner & Zabin, 2008; Beringer, 2007; Belland, et al., 2006).

However, PBL is challenging for some teachers to implement for several reasons. First, it requires specific skills that enable teachers to enact PBL effectively and integrate technology into projects in meaningful ways (ChanLin, 2008). Second, incorporating PBL in classroom instruction requires teachers to develop alternative assessment methods (Doppelt, 2009). Third, innovative classroom management techniques should be used to maintain discipline and control the flow of information (Baumgartner & Zabin, 2008). Finally, PBL is viewed as time-consuming, and requires hard efforts to implement as it necessitates the reforming of classroom structure as well as the re-orientation of teacher and student roles (Bradley-Levine et al., 2010).

### *7.3 Incorporating Project Work into the ESP Classroom*

Stoller (2006) remarks that interest in project work and its integration into ESP instruction is growing around the world because it easily lends itself to: a. authentic language use, b. a focus on language at the discourse rather than the sentence level, c. authentic tasks, and d. learner centeredness, all characteristics of ESP (Robinson, 1991). While ESP classes prepare students to communicate specific technical-field information, PBL helps them acquire and using academic skills such as conducting research, summarizing and giving presentations using English. In this context, Noom-ura (2013) emphasizes that PBL and ESP are a perfect match because the main components of PBL and the distinguishing characteristics of ESP can precede hand-in-hand to enhance language acquisition and achievement of proficiency.

Project work, when integrated into ESP classroom, requires multiple stages of development to succeed. Different steps have been proposed by Stoller (2006) and Dhieb-Henia (1999), and who presented easy-to-follow multiple-step process that can guide teachers in developing and sequencing project work for their classrooms. They also proposed a straightforward and useful description of project work and the steps needed for successful implementation in an ESP classroom. The 11-step sequence model gleaned from Stoller (2006), Richards and Renandy (2001), and Dhieb-Henia (1999) can be said to be the most suitable for this study. These steps are:

- Defining a theme
- Determining the final outcome
- Structuring the project
- Identifying language skills and strategies
- Gathering information and exchanging materials
- Compiling and analyzing information
- Writing the first draft

- Oral presentation
- Writing the final version of the project
- Final presentation of projects
- Scoring and grading.

The model above allows easy management of project work and creates a relaxed learning environment in which both students and instructors work together to develop interesting projects that promotes effective content learning.

## **8. Method**

### *8.1 Research Design*

The research design used in this study is the pre-post test experimental-control group design in which two intact groups of subjects are randomly assigned to experimental and control groups.

### *8.2 Subjects*

Subjects of the study were third level students at the Computer and Information Technology Department of the College of Science. They have done six years of general English at the intermediate and high schools and two terms at the university. The overall number of the subjects is 86 divided into two classes (43 each) and studying the same course. Class (A) students constituted the experimental group while class (B) represented the control group.

### *8.3 Instruments*

To achieve the objectives of the present study two instruments were developed:

#### 8.3.1 Needs Analysis Questionnaire

The main aim of the questionnaire is to gather information related to students' needs in area of ESP. The questionnaire is a polytomous scale consisting of three sections covering most of what computing students might need to be able to use English in their specialization. Most of the questionnaire items were inspired by students' written or oral comments their ESP needs. Some items were suggested by expert EFL instructors who have good experience in teaching ESP courses. Other items were derived and adapted from previous studies (Xenodohidis, 2002; Stapa, 2003; Beringer, 2007; Baumgartner & Zabin, 2008; Mega, 2009; Tsou, 2009; Borza, 2013; Fragoulis & Noom-ura, 2013; Tsai, 2013). After constructing the questionnaire, it was submitted to a group of TEFL experts to estimate its validity and reliability Cronbach's Alpha Coefficient was used to estimate internal consistency of items. Alpha reliability estimate for the questionnaire was 0.699 which is a reasonably acceptable estimate with such kind of tools. The same panel was consulted to test the validity of the questionnaire.

#### 8.3.2 The Pre-Post Vocabulary Test

The purpose of the pre-post vocabulary test is to measure to what extent the subjects master the required vocabulary to maintain a good level in English in their specialization. The target language use (TLU) domain (Note 2) is defined as the required vocabulary for the subjects' computing specialization. This test consisted of five sections each of which addressed some certain vocabulary. These sections were:

Completion

Matching synonyms

Giving antonyms

Multiple Choice Questions (MCQ)

Translation (into English and into Arabic).

The reliability of the test that was measured by Cronbach's Coefficient Alpha was 0.755. Concerning the validity of the test, one approach of establishing it involved scrutiny of the test content (content validity) by relevant panel. This process investigated how relevant, representative the test content was in its coverage of the vocabulary items that should be measured. This process also gave evidence about measurement properties of the test items. The other approach of establishing self-validity was by calculating the square root of the reliability estimate (El-Bahi, 1979). Accordingly, self-validity value was (0.87) which is considered an acceptable estimate. After estimating the reliability and validity of the test, it was used as the pre-post assessment tool.

#### 8.4 Students' Project Work in the ESP Course

##### 8.4.1 Aims

The ESP project-work course aims at developing students' language skills in general and vocabulary in particular in the context of computing and information technology. Specifically, it aims at:

Developing students' vocabulary acquisition.

Enabling students to comprehend Basic English in the field of computer science & information technology.

Enabling students to use technical terms.

Promoting self-learning and co-operative learning.

Sketching feasible projects in their specialization using English.

##### 8.4.2 Content

The ESP project work course was designed in the form of a series of weekly projects and one term project. The project titles were chosen in light of the results of the needs analysis questionnaire. Projects covered a variety of topics (ten topics for weekly projects plus one major topic for the term project) related to students' field of study:

###### *Weekly Projects*

*Project 1:* Parts of a computer and their functions.

*Project 2:* Purchasing a computer.

*Project 3:* The different types of computer used in the faculty.

*Project 4:* Experimental systems for distance learning.

*Project 5:* Information distribution over the WANs.

*Project 6:* Implementation and management of LAN.

*Project 7:* Suggesting an interactive approach for the networks systems.

*Project 8:* Designing a web site for the university.

*Project 9:* Information and communication.

*Project 10:* Internet.

###### *Term Project*

Designing a dictionary program for the most frequently English terms in academic disciplines.

##### 8.4.3 Techniques

A variety of innovative techniques suitable for project approach were employed. Co-operative learning techniques were used throughout the program where students worked together in developing their projects. Peer and group coaching were also practiced along with individualized learning and activity-based learning.

##### 8.4.4 Data Collection Sources for Projects

Field visits, interviews, surveys, libraries, internet search engines, academic disciplines and staff.

##### 8.4.5 Students' Role & Teacher's Role in the Project Work

The project-based learning approach creates a "constructivist" learning environment in which students construct their own knowledge and become independent learners. Teachers who involve their students in project-based learning activities also find their own role logically and naturally changing. Rather than being the task master, they discover their primary tasks are to guide and coach and mentor their students. They teach their students how to question, collect data, debate, discuss, take notes, design and write reports and how to develop strategies for locating information. They become co-learners as their students embark on a variety of learning projects. The teacher in the project based learning is an advisor, mentor, and peer member of the group, facilitator, and consultant.

##### 8.4.6 Assessment

Formative and summative assessment methods were used in the form of:

Portfolio assessment,

End of class assessment,

Two monthly quizzes,

End of term exam.

#### 8.4.7 Classroom Dynamics during a Sample Weekly Project

Classroom dynamics during a Sample Weekly Project can be summarized in the following steps:

**Project title:** Investigating types of computers used in the faculty and their functions.

**Aims:** Upon the completion of this project students should be able to:

**a -** Scan texts for specific information.

**b -** Use these words: “mainframe, multimedia, notebook, laptop, handheld, PC, minicomputer, monitor, modem”

**c -** Learn subject matter through English.

**d -** Use language to learn something new about the project’s topic.

**Time:** Two 75-minute classes (meetings).

**Process:**

##### First meeting

**Step 1:** Through discussion and possible negotiation, students agree on a theme for their projects. Students agree to compile and compare different types of computers as they are used by staff, personnel, and students whether they are used in classes, laboratories, libraries or other different places in the faculty. Then the researchers encourage students to find partners having.

**Step 2:** The researchers, as mentor, encourages students to work in pairs and small groups to brainstorm computer-related vocabulary, all the words that they know to talk about computers. A student was then chosen to write these words on the board for the class to copy with the write spelling.

**Step 3:** The researchers elicit some examples, e.g. a professor would use a laptop in class. Then get the students think about and find as many examples of who would use a certain type of computer and what for.

**Step 4:** Students decide on the final outcome of their project and the researchers divide them into groups of 7 to form six research groups. Based on the students’ background knowledge and the researchers’ help, the different types of computers were listed on the board. Each group was asked to collect as many information as they can about each type in relation to its specifications, features, uses, functions, etc.

**Step 5:** Teacher and students agree on the different methods of collecting the required information for their project. Students agree to review authentic material; survey college personnel, students and staff to identify the types of computers that are used and what they are used for.

##### Second meeting

**Step 6:** Students meet in their groups and exchange and summarize the information they have accumulated. Groups will then meet in a jigsaw fashion (i.e., new groups made up of representatives from each original group) and query each other about what they have collected.

**Step 7:** Students then return to their original groups in order to prepare for the oral presentation that summarizes their project and its findings. After listening to all group presentations, the students discuss the characteristics of the different types of computers and their functions.

**Step 8:** In the process of completing the project, students practiced the English language skills in different ways:

*They participated in teacher – centered question and answer activity.*

*Students have to scan texts that discuss types and functions of computers.*

*Students translate words.*

*Students take notes and write summaries.*

*Students role-play to impersonate a potential interviewer and interviewee.*

**Step 9:** Students draft a brief report in an appropriate register, using the new vocabulary items that summarize their views about the different types of computers and their functions.

*Step 10:* Writing the final report of the project (revised draft, editing, and final version).

*Step 11:* Students give final presentation of the project.

*Step 12:* The researchers reflect on what students have achieved in the process (in terms of language improvement and acquired content knowledge). The researchers discuss the final report and gives grades. The evaluation criteria used for feedback on rehearsals include the following:

- \* Introduces the topic clearly and completely.
- \* Speaks in a way that is easy to understand.
- \* Is responsive to the audience.
- \* Shows knowledge of the topic.

As a final procedure the researchers discuss the problems that students encountered, and identify areas that need clarifications.

#### 8.4.8 Office Dynamics during a Sample Term Project

In addition to weekly projects the researchers designed a term project that continued for three months. This project was carried out side by side with weekly projects and in collaboration with subject matter specialists.

**Project title:** Designing a dictionary program on the frequently used English terms in academic disciplines.

**Aim:** This project aims at:

- a. Increasing students' vocabulary acquisition in the area of computer technology.
- b. Enhancing students' reading skills.
- c. Developing translation abilities.
- d. Fostering self-instruction and co-operative learning.
- e. Maximizing and emphasizing students' roles.
- f. Developing writing abilities.

**Time:** This project was completed in twelve consecutive weeks and meetings took place in the library and the researchers' office.

**Process:** The project went through the following steps:

- a. The students were divided into eight groups.
- b. Each group was assigned to survey their specialist courses and gather the vocabulary items that start with the alphabets of their groups. I.e., group ONE was assigned to collect and translate the words starting with the letters "A, B, C".
- c. The students' findings were revised and corrected by subject-matter specialists.
- d. The students met regularly with the researchers, for consultation and feedback, on every other week and during office hours.
- e. The final draft of each group was typed on a computer and saved on a floppy disk and by the end of week ten groups were able to submit their findings.
- f. Another group of students, group No. nine, designed a dictionary program that was fed by the 2800 vocabulary items collected by the eight groups. The dictionary program is a user-friendly that can be used by other students in the college.

## 9. Results

The data obtained from the research instruments were processed using "SPSS for Windows Version 10.0" Statistics Software and summarized using descriptive and inferential statistics. The quantitative data gathered were tabulated and analyzed statistically using frequency of responses and weighted percentages. The result of the questionnaire application is shown in the table below (1):



Table 1. Frequency and weighted percentages of the subjects' responses on the needs analysis questionnaire

<i>Items</i>	<i>NRA*</i> <i>1</i>	<i>LR</i> <i>2</i>	<i>R</i> <i>3</i>	<i>GR</i> <i>4</i>	<i>Weighted percentage</i>
<b><i>I- English Language Skills Needed:</i></b>					
<i>1- Ask and answer questions about computing.</i>	0	3	35	5	3.04
<i>2- Scan a text for specific information.</i>	0	4	33	6	3.04
<i>3- Make simple instructions using the imperative.</i>	0	15	25	3	2.72
<i>4- Write summarizes for longer texts.</i>	0	11	29	3	2.81
<i>5- Make affirmative and negative statements.</i>	0	6	34	3	3.16
<i>6- Make inferences from a text.</i>	0	1	30	12	3.26
<i>7- Describe the function of a device.</i>	0	0	20	23	3.53
<i>8- Use sequence words necessary for making instructions.</i>	0	3	30	10	3.16
<i>9- Understand a spoken description.</i>	0	3	20	20	3.4
<i>10- Use grammar related rules.</i>	0	9	21	13	3.09
<i>11- Know and use vocabulary related to computer science.</i>	0	0	10	33	3.77
<i>12- Read for detailed information.</i>	0	1	12	30	3.67
<i>13- Write brief explanations.</i>	0	0	8	35	3.81
<b><i>II- Learning &amp; Teaching Preferences:</i></b>					
<i>14- Use problem solving activities.</i>	0	1	9	33	3.74
<i>15- Develop projects through co-operative learning.</i>	0	0	7	36	3.84
<i>16- Take notes.</i>	0	3	17	23	3.47
<i>17- Make projects.</i>	0	0	10	33	3.77
<i>18- Work in pairs.</i>	0	0	11	32	3.74
<i>19- Work individually.</i>	10	11	22	0	2.28
<i>20- Listen to lectures.</i>	20	23	0	0	1.53
<b><i>III- Topics to be covered in the English Course</i></b>					
<i>21- Parts of a computer and their functions.</i>	0	0	8	35	3.81
<i>22- Purchasing a computer.</i>	0	0	21	22	3.51
<i>23- Input &amp; output units.</i>	0	10	20	13	3.07
<i>24- The different types of computer used in the faculty.</i>	0	1	19	23	3.51
<i>25- Language and science today.</i>	2	16	19	6	2.63
<i>26 - Experimental systems for distance learning.</i>	0	5	20	18	3.30
<i>27- English for specific purposes.</i>	0	20	20	3	2.60
<i>28- Information distribution over the WANs.</i>	0	0	21	22	3.51
<i>29- Satalites.</i>	2	10	19	12	2.91
<i>30- Implementation and management of LAN.</i>	0	0	8	35	3.81
<i>31- Interactive approach for the networks systems.</i>	0	2	19	22	3.47
<i>32- Reading scientific magazines.</i>	15	20	8	0	1.84
<i>33- Designing a web site for the university.</i>	0	0	8	35	3.81
<i>34- Unidentified Flying objects ( UFO)</i>	30	13	0	0	1.30
<i>35- Information and communication.</i>	0	0	21	22	3.51
<i>36- Internet.</i>	0	0	0	43	4.00

\*Please Note: NRA (Not required at all), LR(Less required), R (Required), and GR (Greatly required).

Accordingly, the cut-score (Note 3) point in the questionnaire was (3.26) for part one and (2.69) for part two and (2.65) for part three. Thus, all the needs with weight percentage higher than the criterion were regarded as the greatly required needs for the target group, and consequently became the focus of the ESP course and the project work. Students expressed their desire to develop and use vocabulary related to computer science through making projects, working individually and in pairs or small groups, and using problem solving activities. In order to investigate the differences between the scores of the two research groups in the pre-and post testing of the observation sheet, the researchers made use of “t Independent Samples Test” differences between the results of the two groups in the pre-and post application of the vocabulary test. These results are discussed and interpreted in relation to the research hypotheses. The following table (2) shows the statistical differences between the mean score of the experimental group in pre and post application of the observation sheet.

Table 2. Means and (t) value of the experimental group scores in the pre-post testing

Administration	N	Mean	Paired		T	DF	Tab. T	Sig. (2-tailed)
			Differences					
			d	$\sum D^2$				
Pre	43	9.12	20,47	1182,77	25,28	42	,372	0.01
Post		29.58						

As displayed in the table above, there are significant statistical differences between the mean scores of the experimental group in pre and post testing in favor of post- testing. Obviously, calculated't' (25, 28) is bigger than tabulated't' (, 372) at the degree of freedom (42) and this is significant at 0.01 level. This proves the validity of the first research hypothesis "There are significant statistical differences between the mean scores of the experimental group in pre and post-testing of the English vocabulary test in favor of post-testing". These results could indicate that the subjects in the experimental group demonstrated improved performances in vocabulary and computer terminology acquisition after participating in the proposed project work.

Regarding the second research hypothesis stating: *There are significant statistical differences between the mean scores of the experimental group students and the control group students in the post application of the vocabulary test in favor of the experimental group*, the significance of the differences between the scores was computed as shown in the following Table 3:

Table 3. Means, std. deviation, and (t) value of the scores of both the experimental group and the control group post testing

Group	N	Mean	Std. Deviation	T	DF	Tab. T	Sig. (2-tailed)
Experimental	43	29.58	5.84	15.89	84	,267	0.01
Control	43	12.79	3.58				

The table above shows that there are statistically significant differences between the mean scores of the two research groups in post-testing in favor of the experimental group and accordingly proves the validity of the second hypothesis.

### The Project Work Effect Size

Effect size is the complementary and supplementary aspect of statistical significance. To calculate the effect size (d) for the suggested program, Eta Square ( $\eta^2$ ) was computed using 'T' value for the differences between the means. The table below shows that the independent variable (*project work*) had a large effect size on developing the English vocabulary and computer terminology for the target sample. The table below (4) summarizes this statistic:

Table 4. The effect size for the project work

Independent Variable	Dependent Variable	t	DF	N2	D	Effect Size
Project Work	Vocabulary Acquisition	15.89	42	0.94	7.8	Large

The students work at their own pace and at the same time feel comfortable and secure in the team as they choose their partners themselves and work cooperatively in a student centered environment.

## 10. Discussion

The purpose of the present study was mainly to test the impact of integrating project work into ESP instruction on developing vocabulary acquisition of tertiary level students in Qassim University. This was achieved through identifying the English language needs of computer science students at Qassim University in Saudi Arabia, offering theoretical support for developing ESP courses for EFL students, providing guidelines for integrating project work into ESP courses, developing a framework for an ESP course for computer science students based on students' work, and testing the effect of involving students in project work activities on developing their acquisition of computer-related vocabulary. The study has led to important findings regarding developing vocabulary acquisition through the integration between project work and ESP. One of the most important findings is the appropriateness of project-based learning for ESP students. This kind of work emphasized creativity over productivity through providing a relaxed learning environment in which students worked together freely and at their own pace away of the traditional classroom setting to accomplish group tasks. It also enhanced the teaching and learning of ESP and developed new study habits for learners by promoting self-directed, independent, cooperative learning as well as out-of-classroom learning. Project work enabled the students to focus on their learning process and allowed them to see their progress. These findings are in line with Tsai (2013), Tsou (2009), Baumgartner et al. (2008), Caruso and Woolley (2008) and Mannix and Neale (2005) who found that in undertaking the project, the students were involved in a string of process-oriented events such as pair or group discussions and problem-solving activities. They believed that group projects can help students develop a host of skills that are increasingly important in the professional world. They also concluded that the process leading to the end-product of project-work provides opportunities for students to develop their confidence and independence. In this context, Papastergiou, (2009) points out that to teach is not simply to get learners to know the result, but to lead them to taking part in the process of gaining knowledge. Positive group experiences, moreover, have been shown to contribute to student learning, retention and overall college success (Astin, 1997; Tinto, 1998).

The researchers also recorded the positive reaction of main course instructors who gave their full backing and support for the groups whose projects fell within the scope of their discipline through providing reading materials, suggesting useful ideas, and translating difficult terms. The researchers noticed that project work activities improved students' motivation to learn and offered a potential solution to many problems in the development of ESP courses through establishing a new kind of cooperation between English instructors and subject-matter ones. This kind of cooperation and coordination was effective and remarkable since both the English instructors and subject-matter ones were involved in a co-teaching process for the first time. This team teaching offered an encouraging teaching situation that affected students overall proficiency. Such a result emphasize those of Thaher and Abu Shmais (2005) and Byron (2000) who found that team language teaching that is based on cooperation between the subject matter instructor, who acts as an informant on what goes on in the subject discipline, and the English language instructor has successfully improved the language skills of most ESP students. They added that the team teaching enabled both types of instructors to build a bottom up ESP curriculum based on designing materials that meet the students' actual needs. It was also found that integrating project work in the ESP classroom improved students' communicative and cooperative abilities and turned English to be an effective means of communication inside and outside the classroom when students were working on their projects. Project work helped the subjects of the study to develop some interpersonal skills such as lifelong learning skills, critical thinking skills and collaborative skills that encouraged them to communicate effectively with their peers to achieve their goals efficiently. Introvert or quiet students had the chance to gain some confidence when they participate in pair or discussions. In addition teaching has become an easier and

enjoyable task since instructors have given part of their responsibilities to the learners. Another important outcome was at the level of motivation. Project work tasks provided students with the required framework to work and learn with a sense of a learning purpose other than passing an exam. Students read articles, summarized texts, suggested ideas, corrected each others' spelling and pronunciation mistakes and searched the library for information. They turned to be good seekers of knowledge rather than passive receivers. These results confirm those of Hye-Jung et al. (2012), Tsai (2011), Sever et al. (2010), Beringer (2007), Fischer (2007), Fried-Booth and Diana (2002), Stoller (2006), Allen (2004), Gu (2003) and Xenodohidis (2002) who found that students involved in project-work activities have demonstrated positive attitudes toward learning as they found themselves engaged in purposeful communication to complete authentic activities using the language in a relatively natural context. Students also were motivated to meet the challenge because they thought they may encounter similar problems in the future career. However, the researchers noticed that some students used Arabic other than English for in-group discussion. Also, there were students who did not contribute to the group's effort, yet wanted to benefit from the mark given to the group. In addition, some project-based tasks may be beyond the knowledge of English instructors because such tasks are closely related to content subjects. Such a problem can be avoided by having the subject instructor and the English instructor work together.

Based on the results of the present study, the researchers suggest designing ESP courses based on project work for other fields of study, extending project work in General English language courses, and utilizing project work to develop different language skills i.e. speaking, listening, reading, and writing.

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## Notes

Note 1: Results of the needs analysis questionnaire

Note 2: This term was first introduced by Bachman and Palmer (see Bachman & Palmer, 1996)

Note 3: Cut-score refers to a score that represents achievement of the criterion (Davies et al., 1999, p. 40).

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