

Effects of Creative Project-based Instruction Approach (CPBIA) on Learners' Attitudes Towards and Achievement in an ESP Course

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Abstract— The study explored whether CPBI is effective in helping Saudi ESP learners improve their language skills and attitudes towards learning through higher order thinking practice, compared with the traditional ESP methodology that tends to employ rote learning and pattern-based practice in the classroom. The overall objective of this study was to develop an ESP course and to tap into the effectiveness of creative project-based learning (PBL) by inducing creative writing in ESP. Employing quasi-experimental research, t-test results indicated that the experimental group outperformed the control group to the advantage of the former both on achievement in ESP and the learners' attitudes towards learning the CPBIA-based ESP course which indicated the students had positive attitudes after the treatment was given. Discussion of the results followed, and recommendations for practice and research were dealt with at the end.

Keywords—ESP-EGP- creative project-based instruction approach (CPBIA)-achievement-attitudes.

I. INTRODUCTION

ACCORDING to Voght and Grosse (1998), language education relevant to future career interests of the learners appeals to more students and ‘attracts them to study foreign language and culture because they see the connection between their career aspirations and second language and culture knowledge’ (p. 11). It is further argued that foreign language education will have to “focus on the needs of the majority of our college students, who will not be educators, but business people, international lawyers, medical professionals, social workers, and other professionals” (Voght and Grosse, 1998, p. 9).

While the importance of real world applications of language learning is emphasized throughout the literature on languages in the professions, little research exists on ESP in Saudi science colleges. To understand both the existing programmes and the likely needs of college students, researchers need to examine these students' attitudes towards English and their performance in the required skills of the language.

The field of English for Specific Purposes has emerged out of the field of English as a Second/Foreign Language to meet the specific academic and professional needs of learners. Courses in ESP focus on the specific vocabulary and the unique language skills in a given field that the students are likely to require (Allwright & Alright, 1977; Boshier & Smalkoski, 2002; Crandall, 1984). For example, students in English for Specific Purposes, an even more recent sub-categorization of the field of English as a Foreign Language, might require instruction in scientific topics, interactions and communication in English in the workplace, and dealing

with scientific literature written in English.

Salient themes in the ESP literature include an exploration of the relevance of an ESP course to real world work situations (Martyn, 2000; Lear, 2003; Kanaoka, 2005; Harding, 2007). Some research in ESP has documented the perspective that traditional language classrooms may not be appropriate for learners who need to learn a foreign language for specific, professional purposes (Widdowson, 1981; Marshall & Rossman, 1989; Martyn, 2000; Irujo, 2000; Dudley-Evans, 2001). It is essential that language for specific purpose courses be based on insights into learners' actual language learning needs, which can be gained through qualitative needs analysis.

Therefore, there are advocates who call for involving students in their learning processes more actively by sharing with them the development of the course material and language learning and teaching methods.

Experiential education is important, as people need to deal with more difficult and complicated problems resulting from today's unstable social and economic circumstances. For their parts, higher educational institutions, such as colleges and universities, need to perform as authentic human development places, where reflection and reasoning are cultivated, and cultural knowledge is shared through intellectual collaboration.

Furthermore, experiential learning, which is active learning per se, has come to be successful, implying that reflective thinking can play a vital part in improving the learning processes (Boud, Keogh, & Walker, 1985). It is assumed that creative thinking is related to active, participant learning, which is also substantially grounded in problem solving (Koh, 2000). The role of creativity in entrepreneurship

education is becoming more significant as students and entrepreneurs are confronted with new problems that demand more integrative responses. An experiential language course requires that both the teacher and students find creative ways to learn and to understand. Through experiential pedagogies, students can become valued contributors. Warschauer (1998) further emphasizes that to know English well in the current era entails knowing more than the syntactic, pragmatic and lexical items of the language. It necessitates knowing how to read, write and communicate in electronic environments.

For the same reason, project-based learning (PBL) takes a comprehensive approach to classroom learning and teaching in a creative fashion, seeking to involve students in investigative, real-life and authentic learning grounded in real life problems. This approach strongly promotes experiential learning. Project-based language instruction is a flexible methodology allowing multiple skills to be developed in an integrated, meaningful, ongoing activity. Project-based instruction (also referred to as project-based learning, or PBL) has been defined differently by various authors, but perhaps at its simplest, it is “an instructional approach that contextualizes learning by presenting learners with problems to solve or products to develop” (Moss & Van Duzer, 1998, p. 2).

A projects is typically thought of “as a long-term (several weeks) activity” (Beckett, 2002, p. 54) which are part of an instructional method which “promote[s] the simultaneous acquisition of language, content, and skills” (Beckett & Slater, 2005, p. 108). A major goal of project-based instruction is comprehensible output (Beckett, 2002), which generally occurs both during the project and as the final

product of the project. In terms of the final product, Stoller (1997) outlines several variations such as production projects, performance projects and organizational projects, all of which yield qualitatively different end products.

Project-based instruction allows instructors to teach the four core English skills (along with related cultural elements) while giving both instructors and students freedom in what project they choose and how they carry it out. It is advisable that teachers do not seize full control of projects but rather leave many things to be determined by students (Alan & Stoller, 2005).

A. Purpose of the Study

This study sought to explore the effects of creative project-based instruction (CPBI) aimed at Saudi science students studying English for specific purposes (ESP).

Research questions

What is the effectiveness of an ESP course grounded in creative project-based instruction and creative, problem-solving, experiential approaches to learning on the attitudes of science students towards the suggested ESP course and what is and their performance in it?

Sub-questions

1. Will the science students be able to enhance their language proficiencies in ESP through CPBI when compared with students receiving traditional ESP methodology in Tanouma College of Science and Arts, of King Khalid University?

2. Will the students be able to improve their attitudes toward learning in the ESP class through CPBI when compared with students receiving traditional ESP methodology in King Khalid University?

B. Rationale of the Study

There is a relative dearth of empirical project-based language learning studies. As Beckett (2002, p. 58) reports, “research on project-based work in L2 education is rare...[with] most of the available literature consist[ing] of anecdotal reports of how language teachers organized project work for the purpose of second-language acquisition.” In the field of ESP, there is yet more paucity being felt in empirical studies exploring the effectiveness of specialised ESP courses for science students in Saudi Arabia.

Various ESP methodologies focused on project-based learning have been developed and implemented in the classroom (e.g., Ching, 2002; Brown & Lewis, 2003). However, ESP instruction combining creativity and project-based learning, especially in the field of college science, has rarely been implemented at Saudi scientific/technical colleges and universities.

C. Objectives of the study

The study explored whether CPBI is effective in helping Saudi ESP learners improve their language skills and attitudes towards learning through higher order thinking practice, compared with the traditional ESP methodology that tends to employ rote learning and pattern-based practice in the classroom. The overall objective of this study was to develop an ESP course and to tap into the effectiveness of creative project-based learning (PBL) by inducing creative writing in ESP. Therefore, aims of the suggested ESP course are fourfold:

- a) to offer opportunities for motivated students to explore the use of the English language in both academic and informal scientific contexts,
- b) to encourage future development of the science students’

English language skills and educational technology skills once the course has concluded,

c) to give students an opportunity to develop new friendships with others who are interested in English language and culture, and

d) to help students enroll English for Specific purposes classes in science colleges with a renewed sense of what they need to improve in order to meet their professional English learning goals.

D. Significance of the Study

The present study sought to confirm the effects of the design of a project-based and creativity-focused English technical communication class, which sought to enhance comprehensive language skills and attitudes toward learning among Saudi college students majoring in sciences.

The study is grounded in self-directed and experiential learning; thus, bringing learner-centeredness into the classroom, the study also contributes to the field of human development, which may be recognized through the promotion of student self-reflection and self-monitoring during learning processes. Dewey (1956) explained as follows: "development does not mean just getting something out of the mind. It is a development of experience and into experience that is really wanted" (p. 18).

Tacitly expressed, both retrospective and introspective attitudes are indispensable in developing and reconstructing experience (Dewey, 1916). Self-monitoring during the learning process helps students to be more insightful and critical about self-regulation and responsibility in the classroom, since such metacognition enables them to find out their own academic and intellectual strengths and weaknesses through their learning experience (Commander

& Smith, 1996; Diener & Dweck, 1978; EI-Hindi, 1996; Flavell, 1979).

Overall, the study provides opportunities to activate students' monitoring and problem-solving practices (i.e., personal learning experience) in place of the conventional subject and teacher-centered learning environment. While the teacher often plays a central role in a subject-centered learning curriculum (Nunan, 1989), the instructor in the learner-centered system is expected to integrate, coordinate, facilitate, and navigate the planned curriculum with the implemented and assessed curriculum. The instructor's main job is to observe and analyze what is going on in the classroom during the learning process, and then to assess each learner's progress in using appropriate knowledge and skills (Nunan, 1988).

The study emphasizes group-based collaborative and cooperative learning systems rather than individual-based study in the classroom. Students in such a learning environment may convey knowledge structures by explaining their thoughts and ideas through mental or actual diagrams of the structure of new information (Chamot & O'Malley, 1987), which, as a result, will contribute to developing their motivation to learn.

II. LITERATURE REVIEW

This review addresses three areas of significance to the present study: 1) Teaching English for Specific Purposes; 2) Creativity and Critical Thinking in the Classroom; and 3) Project-Based Learning and Instruction in ESP and Language Education.

A. Teaching English for Specific Purposes

ESP is an acronym for English for Specific Purposes for the aim of achieving a specific purpose for the language learner, such as learning English for business purposes), learning to read and write in biology for biological purposes, etc. However, it should be noted that ESP is neither “a matter of teaching specialized varieties of English”, or ‘a matter of science words and grammar for Scientists, Hotel words, and grammar for Hotel staff and so on’, nor is it “different in kind from any other form of language teaching, in that it should be in the first instance based on principles of effective and efficient learning” (Hutchinson & Waters, 1987, p. 18); yet, ESP is “an approach to language teaching in which all decisions as to content and method are based on the learner’s reason for learning” (Hutchinson & Waters, 1987, p. 19). Again, this should be done with the language basics and essential skills being integrated in an ESP course no matter what the needs of the learners are or what their purposes for learning the language could be (Douglas, 2000).

In this vein, ESP is defined by Ruiz-Garrido, Palmer-Silveira, & Fortanet-Gómez, (2010) as:

“Specialised languages usually refer to the specific discourse used by professionals and specialists to communicate and transfer information and knowledge. There are as many specialised language as there are professions. This what has usually been known as Language for Specific Purposes or, when applied to English, English for Specific Purposes (ESP), i.e., the special discourse used in specific settings by people sharing common purposes”. (p. 1)

By the same token, Bankson further defines it as thus: ‘ESP courses are designed to concentrate on the identified language needs, skill needs and interests of a particular

group to ESL student learners...the language becomes the not the sole object of study...is the medium through which specific topics mastered while building English skills', (Bankson, 1996, p. 2). Tacitly, Fox, et al. (2003, p. 530) define ESP as "the teaching of English to business people, scientists, etc. whose first language is not English", (p. 26).

In a similar vein, Heredia (2000) explains that ESP is a branch of teaching English as a Second Language according to the needs of the learners and similar to this is the syllabus which must address the specific needs of the learners. In this regard, too, Philip Skeldon (2008) critiques ESP courses by stating that "ESP is a parlous state and is being abandoned by many tertiary institutions ... the English teachers seemed to learn a lot of science, but the students didn't seem to learn much English" (p. 72).

Jeong (2001) distinguishes between ESP and EGP (English for General Purposes), stating that ESP course design arises not from 'the existence of a need, but rather [from] an awareness of the need', (p. 2). Jeong (2001) further explains that 'an ESP course is characterized by its content, namely science, medicine, commerce, tourism, etc.', (ibid).

In this regard, Tharp-Wiesauer (2002) elaborates that "the needs of the learners may be assessed at many levels and functions, including fluency, learning styles, occupation, and how the target language will be used... the ESP curriculum is then designed to best fit the learners" (p.3). Therefore, "an ESP... course is purposeful and is aimed at satisfying the specific needs of the student with ultimate goal of the learners' successful performance of the occupational and educational roles" (Dehrab, 2002, p. 68).

Wallace (1985) describes language content in an ESP course as one that is 'primarily a system which has to be

mastered by the learner' and in the second language is 'seen as primarily as a medium of communication... the former is called the descriptive approach, and the latter, the communicative approach', (p. 62).

Richards (1990) proposed some "communicative needs in the target language" (p. 2), including the adequate setting of learning environment, the development of "communicative events and speech acts," the establishment of language proficiency level, and the emphasis of specific "language modalities" such as reading, writing, listening, and speaking (p. 2). Therefore, In ESP courses, it is important for instructors to find out students' learning goals, needs, as well as the learning strategies including the activities they prefer and the pace of learning they enjoy (Dudley-Evans & St John, 1998).

To conclude this part, ESP seems to be so well-defined that it refers to the teaching (for teachers) or learning (for learners) of English through an approach that emphasises certain skills, certain language components and certain scientific content which can be defined and integrated in the language syllabus by the determined needs and purposes of language learning on the part of the learners, and more importantly by their awareness of why they want to learn the language.

B. Creativity and Critical Thinking in the Classroom

University is an important learning environment where students can spend most of their higher education time and acquire the skills that will remain with them in the workplace. Field experience, therefore, can be regarded as a 'cultural laboratory' for advanced, experiential learning (Beyer, 1984) where learners explore their own critical and creative self-reflection through collaborative interactions

amongst students and teachers on the one hand and students and their peers on the other. Although Saudi schools as well as tertiary education institutions tend to emphasise self-centred symbolic or monolithic thinking and learning, mainly grounded in homework and exercises as identified by Klein (1992), shared cognition in the classroom must be regarded as an important element for inducing active, interactive learning.

Therefore, college education should foster learning experiences applicable outside the lecture halls. In this regard, it is not the planned curriculum, but the implemented curriculum that can help learners perform critically; thus, Nunan quizzically noted: “The learners’ classroom experiences are more important than statements of intent in determining learning outcomes” (Nunan, 1988, p. 22). Experiential learning deeply rooted in self-reflection hinges on creative and critical thinking which play vital role in experiential learning processes as people “recapture their experience, think about it, mull it over and evaluate it” (Boud, Keogh, & Walker, 1985, p. 18).

In this way, Benson (2001) maintained that creative and critical thinking that are conducive to self-reflection should be seen as the bridge between experience and theoretical conceptualization. Reflective thinking is divided into two types: critical reflection and technical reflection (Sparks-Langer & Colton, 1991). Technical reflection stresses the optimum means to of problem solving. Critical reflection, however, focuses on knowledge development from holistic viewpoints, now that “knowledge is constructed through interaction between the mind and the context surrounding the problem” (Sparks-Langer & Colton, 1991, p. 38).

Here in this regard, language teachers are expected to

observe the learners' motivational development through their changed attitudes and beliefs about learning as well as motivation (Dornyei, 2001). Towards this goal, ESP instructors and language teachers need to know "not only what their learners believe about language learning, but also whether their beliefs are functional or dysfunctional and how dysfunctional beliefs can be modified" (Benson & Lor, 1999, p. 471). Therefore, if learners fail to set right their dysfunctional beliefs, instructors can assist them identify the problems and find out possible solutions through critical reflection.

By the same token, creativity, along with problem-solving skills, is necessitated to be developed in the field of English for specific purposes (ESP), including English classes related to science and technological fields in Saudi Arabia. By definition, creativity is the ability to produce work that is both novel (i.e., original and unimitated) and appropriate (i.e., useful and adaptive as to task constraints) (Sternberg & Lubart, 1995).

In science and technology education, for instance, students are encouraged to negotiate meaning in real world contexts. They are asked to exercise critical thinking in solving problems. Thus, problem solving and critical thinking are reciprocally interrelated; one cannot be performed without the other (Brookfield, 1987; Paul, 1992).

Furthermore, critical thinking is defined as the intentional application of rational, higher order thinking skills such as analysis, synthesis, problem recognition and problem solving, inference, and evaluation (Angelo, 1995). Albeit, both creative thinking and critical thinking are "two sides of the same coin. Good thinking requires both" (Nickerson, 1999, p. 399). When people think creatively, they develop

“original ideas, unusual approaches to problems, novel perspectives in terms of which to view situations” (Nickerson, 1999, p. 399). As such, a creative thinker “evaluates what creative thinking offers, subjects the possibilities to criteria of acceptability, and selects among them some for further consideration” (Nickerson, 1999, p. 399).

C. Project-Based Learning and Instruction in ESP and Language Education

Projects are better viewed as valuable educational tools used by teachers who would employ a project method inclined towards enabling students to raise questions of continuity in the curriculum (Delisle, 1997; Fried-Booth, 2002; Knoll, 1997). Upon that, using projects can be highly practically significant in assisting students develop deeper thinking and learning (Gorb, 1987; McGrath, 2002, Sexton, 1990).

Task-based project learning, abbreviated as TBPL is a pedagogical approach that involves projects for learning. But, while tasks can be extrinsically assigned by teachers in the classroom, projects originate intrinsically for a practical purpose in the field (Samuel, 1986; Wolk, 1994), and a research project always “involves novelty— at least for the student” (Sharp, Peters, & Howard, 2002, p. 17). TBPL and projects-based learning are both conducive to self-awareness and self-reflection through the project method by motivating the students to work hard for solving a real problem (Sharp, Peters, & Howard, 2002; Solomon, 2003). In this way, projects are “the means by which learners learn how to learn, learn about the world, learn who they are and what they want to become” (Newell, 2003, p. 5).

In project-based learning, learners are fostered to explore

and examine authentic problems occurring in real life. The projects must be implemented in a social context; thereby, students will maximize their prior knowledge and thinking strategies in a community setting (DeMiranda & Folkestad, 2000). Through project-based learning, students will develop a crucial linkage between classroom-based phenomena and real-life experiences. “The questions and answers that arise in their daily enterprise are given value and are shown to be open to systematic inquiry” (Blumenfeld et al., 1991, p. 371).

Through projects, students will learn to identify and acquire key concepts and principles in the real world, eventually discovering socially meaningful and personally valuable facts through consistent inquiry and the necessary problem-solving acts among peers. This method is apt to be appropriately used in university education; according to Gorb (1987),

“In higher education the project system is rarely used; this is not surprising in view of the traditional academic routes through the secondary schools. However, in vocation and professional subject areas (medicine, law, engineering and business studies), and more particularly at postgraduate level, it is surprising that the use of projects is much rarer than would be expected, (p. 300)

Indeed, thinking through hands-on experience can well scaffold learning in a way that induces teachers to balance action and self-reflection in classroom activities so that the students can continue learning by doing in a way that induces self-directional learning (Guzdial, 1998).

In English language education, it is essential to design a project-based language learning environment for active,

interactive learning (Fried-Booth, 1982; Lee, 2002). Such a learning approach will help them realize why they need to learn English (Fried-Booth, 2002). Moss and Van Duzer (1999) argued that project-based learning is useful for language learners to develop negotiating skills and engage in independent work. Skehan (1998) suggested that if a linguistic approach ignored psychological factors, it would not work effectively, even if the pedagogical emphasis were fixed on a skills-centered approach. To develop and induce spontaneity, creative thinking, and self-reflective thinking in foreign language education, a self-directed learning style, rather than an teacher-centred style, is practical for learning a target language (Gardner & Miller, 1999). In this sense, task-based language teaching (TBLT) is effective in target language learning (Brown, 2000; Bygate, Skehan, & Swain, 2001; Ellis, 2003).

Furthermore, Beckett (2002) explained that project-based instruction is useful in foreign language classrooms. Prior research emphasised the importance of this approach to EFL and ESP. For instance, Carter and Thomas (1986) investigated the implementation of project-based instruction by using EFL learners in Britain. Results indicated that learners in the ESP course taught that way felt confident and comfortable in speaking English in a live situation with native speakers in a number of discourse types. Colombo (2002) indicated enhanced motivation through teaching English using a task-based project. Ghaith (2002) suggested that task-based project learning of EFL induced better cooperative learning, student perception of social support, and academic achievement. Brown and Lewis (2003) reached similar results upon teaching ESP through TBPL. Ho (1997) indicated that TBPL also induces reflective and

critical thinking among ESP learners. Soda (1990) suggested that TBPL could also improve attitudes toward learning ESP. Watanabe (2000) indicated that TBPL also induces enhanced reading and writing skills by integration in an ESP course as well as induces learner satisfaction with the course.

III. RESEARCH QUESTIONS

This study aimed at applying a creative project-based instructional approach (CPBIA) in a computer science ESP course designed to foster creativity in college students at KKU. The research questions underlying the study are:

- Will Saudi ESP college learners be able to improve their language skills through CPBIA compared with traditional ESP learning?
- Does the ESP course taught after a CPBIA methodology induce learners to improve their attitudes towards ESP learning compared to traditional ESP learning?

IV. RESEARCH METHODOLOGY

A. Method

The quasi-experimental method of research was used in this study. A quasi-experiment is an empirical study used to estimate the causal impact of an intervention, here the ESP course. It was also used to assess the attitudes of the students towards ESP and the course as well as the development of needed language skills and achievement in the course. The experimental design was of the type: Pretest-Posttest-Control Group Design.

B. Sampling and Participants

Quasi-experimental designs do not contain random

assignment. Researchers use them in order to "control (or at least reduce) threats to internal validity" (Fraenkel & Wallen, 2003, p. 278), since the goal of a research study is to explore the relationship between two variables (Gravetter & Wallnau, 2000). The study employed 24 freshmen at the College of Sciences and Arts at Tanouma, off King Khalid University during the first semester of the year 2013. They were hired for the study for a period of 3 months. The students came from the computer science department studying English for specific purposes.

The students were allocated to two groups, a control group and an experimental group; the former took the normal ESP class with the conventional methodology that is commonly used at King Khalid University, while the latter experienced the projected ESP with a CPBIA methodology.

C. Procedures

Students in the treatment group were asked to develop a new product to be used in daily life. Exercising their knowledge and skills in computer technology, students in the treatment group designed their original product in two groups. Each group was composed of six students who went through the whole process of project work, ranging from the initial design concept to the final oral presentation. Group-based collaboration and peer feedback were emphasized in order to promote the students' higher order thinking skills, including problem solving and self-reflection. Some language learning materials, such as a list of ESP vocabulary, model sentences, and discourse markers, were provided so that the students could make the most use of them to describe and explain their original products. More importantly, participants in the treatment group were urged to think critically and creatively.

Meanwhile, students in the control group were asked to memorize the content of the same language learning materials that were prepared for the treatment group. Not through group work, but through individual work, each student in the control group engaged in learning ESP through the traditional approach which was essentially teacher-centered, memorization-focused, and rote learning emphasizing pattern-based practice in the classroom. For instance, students in the group were asked to read ESP words and idioms repeatedly so that they could pronounce them correctly while being asked to memorize their equivalent Arabic meanings.

An ESP achievement test, developed by the researcher, was employed as a pretest and posttest in order to evaluate student language achievement in ESP. In addition, a survey to tap into the changes in language learning strategies and attitudes toward learning in ESP class was also utilised.

V. FINDINGS

To tap into the first research question, quantitative methods were employed to determine the differences in language learning achievement between both groups through comparing the baseline scores on pretesting with the after-treatment test scores using the ESP Achievement in Computer Science Test.

T-tests were used to test the first question: Will Saudi ESP college learners be able to improve their language skills through CPBIA compared with traditional ESP learning?

Table 1 shows that there were initially no differences in language proficiencies between the control and treatment groups.

TABLE 1

T-TESTS FOR THE BASELINE SCORES

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mean</i>	<i>difference</i>	<i>Std. Error</i>	<i>difference</i>	<i>t</i>	<i>p</i>
Ctrl	12	12.67	3.86	23	.56	.58	.89			.382
Treatment	12	12.28	3.94							
Ctrl-Treatment										

Note. $p < .05$ (two-tailed).

The following t-tests were run to test whether the control and treatment groups grew in language proficiencies as a result of taking either the CPBI or the traditional ESP course. Both the control and treatment groups increased significantly from pretest to posttest. These results are displayed in Tables 2 and 3 below.

TABLE 2
T-TESTS FOR THE BASELINE SCORES COMPARED TO THE POST-ASSESSMENT SCORES FOR THE CONTROL GROUP

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mea</i>	<i>n</i>	<i>Std.</i>	<i>Erro</i>	<i>t</i>	<i>p</i>
Pretest	12.67	3.86	11	5.95	4.32	.47			-12.62	<.00
Posttes	18.88	4.87								1
t										
Pre-Post										

Note $p < .05$ (two-tailed).

TABLE 3
T-TESTS FOR THE BASELINE SCORES COMPARED TO THE POST-ASSESSMENT SCORES FOR THE TREATMENT GROUP

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mean difference</i>	<i>Std. Error difference</i>	<i>t</i>	<i>p</i>
Pretest	12.28	3.94	1	-6.90	5.01	.45	-15.21	<.0
Posttest	22.26	4.90	1					01

Pre-Post

Note $p < .05$ (two-tailed).

Finally, another t-test was run to examine differences in language proficiencies of the posttests of the control and treatment groups. Results show statistically significant differences obtained in Table 4, which implies that the language proficiencies of the students in the ESP course taught after a CPBIA methodology were much better improved as those in the control group after the intervention.

TABLE 4
T-TESTS FOR THE CONTROL VERSUS TREATMENT GROUP SCORES UPON
POSTTESTING COMPARISONS

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mean difference</i>	<i>Std. Error difference</i>	<i>t</i>	<i>p</i>
Ctrl	12	18.88	4.87	23	.43	.69	.62	
Treatment	12	22.26	4.90					.001

Ctrl-Treatment

Note $p < .05$ (two-tailed).

As seen in the first two tables, substantial growth in the achievement of both the control group and the experimental group attained between pretest and posttest in both groups ($p < .001$). When scores were compared between the two groups, still, there appeared to be more significant differences in both pre-and-posttests between the control group and the treatment group to the good of the experimental group that received the CPBIA treatment.

The second research question explores the variance in student attitudes towards learning the ESP course; a questionnaire based on a 5-point Likert scale was administered after the intervention. This questionnaire was employed to investigate the change of attitudes toward learning. The change in student attitudes toward language learning was analyzed with t-tests. The analytical goal was to identify the differentiated salient features between the control and treatment groups at the end of the study. T-tests were used for each group in order to clarify the change of attitudes toward learning before and after the intervention.

T-tests were run to explore the overall change in terms of attitudes toward learning for the control group and the treatment group. Tables 4 and 5 show the results.

TABLE 5
T-TEST FOR THE CHANGE OF ATTITUDES TOWARD LEARNING:
CONTROL GROUP (N = 12): PRE QUESTIONNAIRE/POST
QUESTIONNAIRE

<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mean difference</i>	<i>Std. Error difference</i>	<i>t</i>	<i>p</i>
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Pretest	96.05	36.99	11	.35	30.51	3.329	-.10	.918
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Posttest 96.39 30.99

Pre-Post

Note. $p < .05$ (two-tailed).

TABLE 6
T-TEST FOR THE CHANGE OF ATTITUDES TOWARD LEARNING:
TREATMENT GROUP (N = 12): PRE QUESTIONNAIRE/POST
QUESTIONNAIRE

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mean</i>	<i>difference</i>	<i>Std. Error</i>	<i>difference</i>	<i>t</i>	<i>p</i>
Pretest	90.23	32.09	11	4.55	23.66	2.14			-2.12	.036

Posttest 99.78 33.04

Pre-Post

Note, maximum = 250, minimum = 50 , $p < .05$ (two-tailed Note, maximum = 450, minimum = 90, $p < .05$ (two-tailed).

TABLE 7
T-TEST FOR THE CHANGE OF ATTITUDES TOWARD LEARNING:
CONTROL AND TREATMENT GROUPS (N = 24): POST QUESTIONNAIRE
ADMINISTRATION

	<i>M</i>	<i>SD</i>	<i>df</i>	<i>Mean</i>	<i>difference</i>	<i>SD</i>	<i>difference</i>	<i>Std. Error</i>	<i>difference</i>	<i>t</i>	<i>p</i>
Ctrl	96.39	30.99	11	1.63	4.31			.33		.37	.709

Treatment 99.78 33.04

Pre-Post

Note, maximum = 250, minimum = 50 , $p < .05$ (two-tailed Note, maximum = 450, minimum = 90 , $p < .05$ (two-tailed).

As seen from tables 5, 6, and 7, there appears to be a significant change between the two groups in both pre and post questionnaires. Table 6 however, shows a positive change in attitudes toward learning in the treatment group ($p = .036$).

VI. DISCUSSION

The Saudi classroom may be characterized by rote learning and dominant reliance on a testing system that lacks creativity, with little attention being paid to metacognitive learning strategies. It could be said that the entire system is test-wise. Warschauer (2000), however, contended that language instructors, especially in the EFL context, and under the appearance of new technological literacies, need to recognize how precisely and decisively the current socioeconomic factors can influence English language teaching, including newfangled teaching methodologies that can help in active, interactive learning.

The Saudi higher education system, including college-level ESP courses, has had difficulty incorporating real learning ESP courses compatible with the workplace requirements into the real world. Therefore, project-based learning and instruction is a practical framework for developing new pedagogies (Fried-Booth, 1982). Consequently, many ESP methodologies grounded in project-based learning (PBL) have been developed and implemented in classrooms

(Brown & Lewis, 2003; Ching, 2002).

Regardless of the autonomous and tedious language learning activities, ESP in traditional programmes have seemingly focused on memorizing the content, believing that ESP learning is just a college course to pass. As a matter of fact, learning goals can be influenced by a desired future situation (Kohonen, 1992), and learner beliefs about self and the learning situation are related to the internal and external context (Benson & Lor, 1999) of the target language, and hence, relating the goals of learning an ESP course to the workplace requirements and the objectives of one's potential career can be very engaging for the students in learning.

As regards the results of the present study, students in the treatment group involved in learning many scientific words, idioms, and model sentences coming from the course materials. Insinuating students to develop higher order thinking skills for the creation of original products, got them apparently in an internal conflict to express their thoughts and ideas in a more concrete and accurate manner through peer feedback and group-based collaboration. While trying to use far-reaching vocabulary from the materials, they spent more time searching and finding other words, phrases, and grammar rules so that they could explain their creative product more accurately and precisely. Some students were motivated to test their ideas; others, however, apparently felt frustrated in building up vocabulary and then explaining their ideas logically and persuasively. Project-based instruction may not be appreciated by all of the language learners at all times (Beckett, 2002). Students in the control group were exempted from such complex tasks; they had only to understand and memorize the given words and phrases without thinking critically and creatively in a

consistent manner.

The issue of comprehending the special text is crucially related to “the subject knowledge, not the language knowledge” (Hutchinson & Waters, 1987, p. 161). Similarly, it suggests that the issue of task comprehension and its achievement may be largely influenced by the subject knowledge rather than the language knowledge.

In terms of the overall change in attitudes toward learning, the treatment involving presenting an ESP course via a CPBIA methodology appeared to engender positive attitudes towards language learning. similar results can be seen in other studies.

Carter and Thomas (1986) reported that EFL learners in Britain succeeded in developing expanded communicative strategies through project-based instruction, which asks for creative thinking to explain different cultural backgrounds. After the project, the learners reported that they felt confident and comfortable in speaking English in a live situation with native speakers in a number of discourse types. Colombo (2002) studied the development of motivation and English language literacy through an Internet-assisted project.

Yogman and Kaylani (1996) suggested that student-centered and group-oriented work on projects allow college ESP learners, even at mixed proficiency levels, to delegate responsibilities and monitor their own progress through their interactions. “With their attention on completing the projects, language became a tool instead of a product in itself” (p. 313).

Even in a short period of time, mini projects, using a portfolio approach, “can be useful in changing emphasis in teaching, modifying outcomes sought from projects or

subtasks” (p. 322). They concluded that what is critically important for ESP learners is “the satisfaction of productive language use,” “learning experience,” and the following “new proficiency relevant to their future occupational needs” (pp. 322-323).

VII. CONCLUSION

This study examined the effectiveness of a CPBIA methodology in an ESP classroom in Saudi college science. In terms of language proficiencies in ESP, the study bore out interesting findings: some significant findings were found between the treatment group and the control group in area of the improvement of English language skills focused on ESP. In terms of attitudes, there was reported a significant improvement. Thus, the researcher recommends that ESP instructors need to experience the challenge of creative work. ESP instructors also need to create original methodologies for teaching ESP so that the courses could be more relevant and more effectively delivered, as “Specific ESP teaching has its own methodology” (Dudley-Evans & St John, 1998, p. 4). The CPBIA is an old teaching approach, but without practicing it, it would be difficult to implement project-based instruction focused on creativity and future imagination. As Lee (2002) suggested, students would become interested in working on projects as a practical motivating tool. Furthermore, it must be realized through solid creative problem-solving skills. That is why it is urgent for Saudi college teachers, including ESP instructors, to create a new methodology aimed at “developing originality and individuality” (Arimoto, 1997, p. 209) for Saudi students.

More research is needed to replicate the present study in order to glean both qualitative and quantitative data which

could highlight and (dis)confirm the findings from the present study.

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