

Integrating Project-Based Learning Strategies in the Design of an ESP Dental Vocabulary Course for ESL Malaysian Majors

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Abstract

The current paper investigates the effectiveness of integrating Project-based Learning (PjBL) strategies in the design process of an English for Specific Purposes Course (ESP) to develop dental vocabulary at the Dentistry College, Al-Azhar University- Cairo- Egypt. The study sampled fourteen ESL dental Malaysian students whose native language is English. This process required a needs analysis to assess the students' academic and professional needs, wants, and lacks to create a course that responds and satisfies their requirements. The study adopted a quantitative methodology where participants were exposed to a dental vocabulary pre-test/ post-test to assess their dental vocabulary background. An interview with academic experts in the field of dentistry also helped in the design of the course. In light of the needs analysis, interviews, and the vocabulary test, an ESP project-based learning strategies course was designed. The results of the study revealed the effectiveness of integrating project-based learning strategies in the ESP course to develop dental vocabulary among ESL Malaysians. It proved that employing innovative strategies in the dental vocabulary classroom fostered the learners' self- autonomy, problem-solving, critical thinking, and creativity.

Keywords: Dental vocabulary, English for specific purposes (ESP), ESL Malaysian majors, needs analysis, project-based learning (PjBL)

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Introduction

Developments in the fields of business, science, medicine, and technology have called upon educators and researchers to shift attention from General English Courses that are widely offered to EFL learners all over the world to develop their linguistic and communicative competencies, to teaching and learning environments based on the language used for specific target situations (Flowerdew & Peacock, 2001; Kennedy, 2001).

General Language Courses are no more supplying either the learners or the employers with the language required for communicating, and accessing necessary information relevant to the context and situation of their specialist target fields (Coffey, 1985; Flowerdew & Peacock, 2001; Hutchinson & Waters, 1987; Strevens, 1977; Strevens, 1980). Many researchers, Ewer and Latorre (1969) and Hutchinson and Waters (1987), called upon the designing of English for Specific Purposes (ESP) Courses to satisfy the different specific needs of learners in their specialized fields of study. Henceforth, a demand for ESP courses has increased throughout the world drawing its techniques and methodologies that suit various disciplines (Dudley-Evans & St. John, 1998).

As a result of the growing demand for huge commerce trading in the oil-rich countries, and the need of billions of people around the world who are currently learning English for different and specific purposes and needs, a massive demand for ESP courses emerged in the late 1060s (Beare, 2012; Hutchinson & Waters, 1987). Thus, ESP has been divided into English for Occupational Purposes (EOP) such as vocational and professional purposes, and English for Academic Purposes (EAP) (Anthony, 1997). This means that ESP courses may vary in their methodologies to include all learners' needs and purposes necessitating the conduct of a needs analysis to determine aspects of language features that learners need to acquire in specific educational settings (Anthony, 1997; Richards, 2006).

Though learning a language necessitates learning its vocabulary, acquiring vocabulary knowledge of that language is a complex multidimensional process, especially for those who need to acquire it for specific needs such as major students (Schmitt, 2000). Vocabulary acquisition allows learners' to understand the world around them and participate in social and academic activities as it affects their reading performance and communicative skills (Blachowicz & Fisher, 2005). Poor knowledge of English vocabulary may result in, among many other things, students' lack of participation in academic learning environments, comprehension of instruction, and lack of understanding as a part of content area teaching. Taking into consideration the importance of ESP vocabulary knowledge and the difficulties that learners may face in their workplace settings due to lack of this knowledge, high demand was raised to choose a teaching procedure that makes instruction effective and facilitates learners' vocabulary acquisition (Blachowicz & Fisher, 2005). Henceforth, Richards (2006) and Dovey (2006) declared a dramatic change in the history of language teaching from traditional approaches of lesson formats into more innovative ones such as task-based, problem-solving, and project-based approaches that prepare the learners for their field of study and workplace with objectives dedicated to this aim which differ from other general course plans. Such methods provide vivid explanations to contextualize and elaborate word meanings, using computers, simulations, authentic materials, illustrations, and other visuals that can help vocabulary acquisition (Watts-Taffe & Truscott, 2000).

As it has been pointed out that most of the information on the scientific, engineering, and medical levels throughout the world is communicated in English, the significance of ESP in vocabulary teaching programs is a must to enable learners to understand and develop the knowledge of the jargon in question (Zengin, Erdogan, & Akalin, 2007). Henceforth, there was a growing need for ESP dental courses that consist primarily of dental terminologies and abbreviations for dental learners at the university level. Therefore, this study aims to develop an ESP dental vocabulary project-based learning (PjBL) course providing teachers and students a systematic way to incorporate it into ESP learning.

Educators have long valued the necessity of putting learners in real-life scenarios to help them gain a better understanding and knowledge of their learning. PjBL is considered an urgent resurgence of redirecting the instructional methods of teaching general language skills to raise students' interests, critical thinking, and experiential learning and inquiry of learning important skills on the level of education, technology, industry and medicine (Bell, 2010; Gut, 2011; Markham, 2011; Stanley, 2012).

PjBL is considered a strategy that declares the decline of students' passive learning and that promotes the importance of increasing students' motivation to enrich more profound knowledge and acquisition of a more skilled workforce on the technological, engineering, mathematical, and scientific levels (Jackson, 2015; Ritz, 2014). The underlying constructivism theory of PjBL promotes better learning through active participation in real learning situations. Lots have been written about PjBL as a teaching strategy that gets students involved in learning knowledge and skills in the framework of an experiential inquiry process that revolves around real authentic and carefully designed tasks. Teaching students theories and principles is not enough to arm them with the competencies necessary to confront workplace complexities, intricacies, and uncertainties. They need to learn how to solve a problem, think critically, and develop practical knowledge. Henceforth, it became important to link theoretical knowledge of a specific profession and the actual practice of it. In this way, PjBL links factual knowledge, skills, and principles to their practical application within a job (Jones, Ramussen & Moffitt, 1997).

With this rationale, the current research sought to answer the questions of "what are the specific English language needs of ESL dental Malaysian students at the College of Dentistry, Al-Azhar University?", "How would the proposed ESP project-based learning strategies course impact the development of dental vocabulary acquisition?"

Literature Review

ESP definition, background, and importance

Rapid changes and developments in the different fields of medicine, technology, science, and business have resulted in radical calls for changes in the learning/teaching process (Hutchinson & Waters, 1987; Strevens, 1977). Employers and market forces are demanding employees with specific knowledge and capabilities that satisfy the needs of market labor. It requires learners with additional English and communication skills in the field of their study. Therefore, English courses for general purposes (EGP) are no more providing learners with the required knowledge for their professional careers. Henceforth, great calls for the design of English for Specific Purposes (ESP) courses have emerged to meet the needs of the learners and the

requirements of the market forces (Coffey, 1985; Strevens, 1980).

As the goal of ESP differs from EGP in the sense that the latter seeks to train the students to communicate in the context of their profession, all undergraduate dental programs sought to design courses and syllabi to provide the students with a broad knowledge base of the dental knowledge as well as a set of other skills such as problem-solving, self-reliance, group work, projects work, and self-autonomy. Moreover, students' oracy and literacy skills are equally important in the globalized context as they ensure their adaptability in a global work culture that requires success in teamwork and personal skills. Therefore, vocabulary building is very important as it helps improve students' communication skills and fosters their self-confidence. Henceforth, ESP connects the effectiveness of dental education by teaching students' dental terminologies with communication skills required in their profession through acquiring them some personal skills of understanding, thinking, synthesizing, evaluating, analyzing, and applying what they learn in the classroom to the outside world of their profession. Here comes the importance of ESP courses in general, and in the dental field of ESL students in particular (Rajeswaran, 2018).

Though there have been great arguments concerning the features and components of ESP courses, however; a considerable consensus is reached regarding the fact that ESP courses are not only confined to teaching the language, but it extends to include learners' needs, wants, lacks, materials, teaching strategies and educational policies (Belcher, 2006; Dudley-Evans & St. John, 1998; Anthony, 1997), (Fortanet-Gomez & Raisanen, 2009). Dudley-Evans and St. John (1998), Johns and Price-Machado (2001) suggested a categorization to ESP courses as it is considered a broad umbrella that has underneath it sub-different branches: English for Academic Purposes (EAP), is mainly needed for business English, technology, and science. English for Occupational Purposes (EOP) is primarily needed for English for Professional Purposes (EPP), like English for doctors and lawyers, and English for Vocational Purposes (EVP), like English for tourism, nursing, and aviation.

The main feature that all these sub-fields share is the focus on learners' academic and professional needs and wants. The different sub-fields of ESP courses are designed to include among many different things the specific needs and demands of colleges, universities, and the market forces. Hutchinson and Waters (1987), henceforth, defined ESP as "an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning" (p.19). This means that the primary focus of an ESP course design is investigating the reason behind it; why do we need it? In addition to the importance paid to the content and method in the design of an ESP course, suitable selection of pedagogical materials would help achieve the goals and needs of the students, as Villalobos and Díaz-Ducca (2017) put it "ESP is the teaching of English to the pupils who have specific goals and purposes", and "ESP can be differentiated from general ELT by its concern with specialized language and practices" Javid (2015).

Characteristics of ESP

Based on the work of Strevens (1980) in ESP, Dudley-Evans, and St. John (1998) used some absolute and variable characteristics contribute to the design of an ESP course. With absolute

characteristics, an ESP course is designed to:

- Satisfy the specific needs, wants, and lacks of the learners;
- Make use of the underlying methodologies and activities of the field that ESP serves; and
- Focus on the skills, language, discourses, and genres appropriate to these activities that an ESP course serves.

With variable characteristics, an ESP course is usually designed for a specific field, so that the methods of teaching English in the field of mechanical engineering, for example, are different from those used in teaching English in the field of medicine. However, some researchers (e.g., Belcher, 2004; Lorenzo, 2005) added that ESP courses require to be addressed with a “tailored-to-fit instruction” (p.135), so they require a needs analysis that distinguishes them from (EGP) courses as they concentrate on preparing learners for specific communicative environments using language in context than on teaching grammar and language structures (Mohan, 1986; Flowerdew, 1990). The primary pedagogical assumption behind ESP teaching is that the language is taught as a crucial part of the learners' needs and wants, and not introduced as a disconnected subject from their needs and wants (Flowerdew & Peacock, 2001).

Project-based learning strategies

Ramussen and Moffitt, (1997, p.11) defined Project-based learning as “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks”. In this sense, PjBL is a system or pedagogy that prepares the students for the real world through developing some personal and educational skills. Dewey (1986) and Vygotsky (1978) laid the foundations for PjBL as they encouraged learning through discovery and experience. Recently, Brown, Collins, and Duguid (1989) and Lave (1990) emphasized that learners learn best and create meaning when they get engaged with the environment, people, and technologies. Moreover, cooperative learning environments are very useful in the learning/teaching process as they trigger learners' interests in learning and motivate them to learn from each other (Brush and Saye, 2000). In this way, PjBL is considered a pedagogical alternation from teacher-centered instruction to learners' self-regulation and thorough engagement with peers, resources, and technologies. The pedagogical approaches and strategies of PjBL have proved very effective with other pedagogies like science, problem-solving learning, self-directed learning, and discipline inquiry (Blumenfeld, Guzdial, Krajcik, Marx, Soloway, & Palinscar 1991; Barton, & Levstik, 1997; Hall, Hannafin, Hill, & Land, 1994; Hannafin, Land, & Oliver, 1999; Dodge, 1997, 1998; Hannafin, & Land, 2000; and Yetkiner, Anderoglu, & Capraro (2008).

Bransford and Stein (1993) found the PjBL approach as both a comprehensive and sustainable instructional approach that engages learners in a compact, consistent, and cooperative assessment. Grant, (2002) added that PjBL focuses mainly on fostering learners' skills through an in-depth investigation of a specific learning situation that allows students to get engaged in the topic till they acquire the skills and knowledge necessary to their academic and career progress and success.

The fact that teaching communicative skills to students may go through tough processes of forgetting the vocabularies needed in certain situations and using them in their inappropriate contexts, raised the issue that learning vocabulary cannot be done through rote learning. This implies that showing words to the students does not necessarily imply that they have reserved them in their long memories. Therefore, learning vocabulary can be a tough task if students are not provided with strategies that enable them to use these vocabularies and construct a network of interrelated vocabularies. PjBL strategies provide students with the opportunity of inductive learning through group work and projects- based activities. Moreover, vocabularies in ESP are easily remembered than in GE as students use them frequently in their workplace (Salazar and Carballo, 2010).

Integrating PjBL strategies with ESP

In this sense, ESP and PjBL share the same purpose of achieving proficiency and promoting language learning through enjoying the same components and characteristics. Henceforth, ESP, and PjBL are integrated and implemented in the present study to make a relaxed learning environment that guarantees successful language learning. In this sense, The Autodesk Foundation (1999) proposed ten useful steps for teachers to follow for developing and sequencing with the PjBL into their classroom:

1. Discovering learners' interests and desires to build on them,
2. Facilitating the teaching/learning process by providing an exciting context for learning,
3. Engaging students in authentic, real-world problems without helping in their solutions,
4. Allowing students to think creatively and take decisions towards their choices,
5. Engaging students in real-world situations and issues related directly to their lives,
6. Demanding learners to show essential skills and knowledge,
7. Training students to problem-solving to deepen their understanding,
8. Creating environments of self- regulation, co-operation, and self- assessment,
9. Demanding students to demonstrate what they have learned, and
10. Applying their skills and knowledge to authentic situations.

Context of the Problem

Dentistry College of Al-Azhar University- Cairo branch- Egypt, offers two separate courses for its dental students. One for native students who learn English as a foreign language (EFL), and the other for Malaysian students who study English as a second language (ESL). Malaysian majors receive four credit hours in both preparatory and first year through their academic instruction. As Malaysia was colonized by the British, English became their second language taught in their schools, and universities, and they used to use it in their daily routine life.

Reviewing the course taught to dental natives of the dentistry College, the researcher found that the course depends mainly on developing the students' linguistic background (grammar, writing, reading, listening, and speaking skills), the reason for separating them.

Contrary to EFL dental natives; ESL dental Malaysians hardly speak Arabic, and have a good command of the English language. Therefore, it seemed impossible to teach them the same course taught to their dental native counterparts. A needs analysis

questionnaire was presented to them to decide upon a course design that satisfies their needs and purpose of the study; ESP. Moreover, the course would be introduced in an attractive framework appealing to the students' needs employing strategies that pinpoint their capabilities and reflect an experiential application of the syllabus.

Structured interviews were conducted with the dental staff in which many questions regarding ESL Malaysians' English background, wants, needs, lacks were addressed. The results of the interviews came in line with the initial observations of the researcher. A dental vocabulary test was also administered to the ESL Malaysian majors to determine their background in vocabulary dentistry, and to build on it the ESP program. This comes in line with Bradley- Levine et al. (2010) and Little (2009), who stated that an ESP should meet the needs and interests of the students and should also be suitable to the requirements of their specialized workplaces. The course would also adopt innovative student-centered approaches that prepare them for professional development to avoid non- involvement in the class, (Baumgarther & Zabin, 2006; Noom- ura, 2013; Sysoyev,2000).

Statement of the Problem

Based on a close analysis of the previous studies and after concluding the findings of the needs analysis questionnaire and feedback from the interviewees, the following issues have emerged: the EFL course offered to the native students at the College of Dentistry, Al-Azhar University is not compatible with the Malaysian dental students studying in the same College; secondly, it was also evident that the course would not help develop English dental vocabulary of the ESL Malaysian majors. Therefore, an ESP course along with PjBL techniques was chosen to come at the English language needs of ESL dental Malaysian students, feature the components of the course in the light of PjBL teaching strategies, and to investigate the extent to which the proposed course would impact the development of the English dental vocabulary of the ESL dental Malaysian students at College of Dentistry, Al-Azhar University.

Hypothesis of the Study

The hypothesis for the current study is stated as:

- *Ho¹ There are statistically significant differences between the mean value of the pre and post-tests in the English dental vocabulary test in favor of the post-test.*

Research Methodology

Research Design

A pre-test/post-test design was utilized in the present study. The dental Malaysian students were exposed to a dental vocabulary test before the start of the experiment. At the end of the experiment, a post-dental vocabulary test was introduced to the same students to measure their progress, if recorded.

Sample of the Study

Fourteen ESL Malaysian students in preparatory year at the College of Dentistry, Al-Azhar University, participated in the experiment. Subjects received a three- month- ESP course presented in the framework of PjBL techniques. All students were equivalent in terms of

English language proficiency as a prerequisite for admission to the College. The participants' native language is English, so all classroom teaching, discussion, and activities are done in English. As English is their native language, they had no difficulty with their general English skills, however; they suffered from the poor limited vocabulary in the dental field which results in insufficient self-confidence on their sides to communicate.

Instruments

The following instruments were used to achieve the objectives of the research:

Needs Analysis Questionnaire

The questionnaire consists of three domains. The first domain covers the learning needs of ESL dental students. The second one covers ESL students learning preferences in PjBL. The third explores the topics covered in the dental ESP course. The questionnaire was submitted to a panel of TEFL experts to determine its validity and reliability. Cronbach's Alpha Coefficient was employed to determine the internal consistency of the questionnaire items with a score of 0.699.

Vocabulary Test

The pre/post vocabulary tests were conducted with the view to measure the extent to which the ESL dental Malaysian students acquire the prerequisite of dental vocabulary to accomplish good grades in their study. Each test examined a few vocabulary items and comprised five sections: Multiple Choice Questions (MCQ), Completion, Matching synonyms, Giving antonyms, and Picture description. The reliability of the test employed Cronbach's Alpha Coefficient and measured as 0.755. A self-validity approach was established by calculating the square root of the reliability estimate scoring 0.87, which is considered acceptable (El-Bahi, 1979). As the validity and reliability of the test were estimated, it was ready to be used as the assessment tool of the experiment.

Structured interview

Structured interviews were conducted with ten female instructors. These informants held Ph.D. degrees in Dentistry, Microbiology, and Physical Medicine. Their ages ranged between 40 and 55 with teaching experience between 13 and 19 years. Each interview lasted for 20 minutes. The emphasis in the interview was given to questions related to the benefits of a dental ESP course, introduction of new teaching methodologies, and current and expected learning levels of the students.

The content validity of interview questions was evaluated using the factor analysis for examining construct validity and reliability by Cronbach's Alpha. The values for interview questions, scored as 0.74, are considered a genuine value.

The interview results revealed that English language needs are significant in medical fields, as English is the lingua franca of medical sciences. All respondents agreed to the suggested innovative methods of teaching ESP courses in medical fields. All respondents appreciated the idea of doing experiments and devising new ways of English language teaching based on project work and problem-solving approaches. They agreed that

instructors in universities should avoid traditional methods of teaching, such as grammar and translation methods. They also accepted that teaching the ESP course to medical students would bring a transformation in their knowledge of the English language. Hence, they urged and encouraged a similar change in EFL education offered to medical students.

Procedures

Before the start of the experiment, a needs analysis questionnaire was distributed among the students to determine their needs, wants, and areas lacking. The items were ranked on a Likert Scale ranging from 1 (Not Important At All) to 4 (Highly Important) and 1 (Poor) to 5 (Excellent), and 1 (Not Helpful At All) to 4 (Very Helpful).

Also, a pre-test dental vocabulary test was introduced to the students to stand at their current level. Due to the results of both tools, the experiment was carried out during the academic year 2016-2017 and lasted for a full academic semester (4 hours a week). The total number of the students was 14 ESL Malaysian majors in dentistry. They were divided into three groups. The ESP integrated PjBL course was planned to execute as weekly projects whose titles were based on the outcome of the needs analysis questionnaire.

Each project covered a specific topic related to the students' field of study. A variety of innovative techniques, i.e., co-operative learning techniques, peer and group coaching, role play, jigsaw, problem-solving strategies...etc., were employed. The students were, therefore required to work together on their projects. The teacher's role was to guide, coach, and mentor students. The teacher guides students to ask questions, collect data, debate, discuss, take notes, write reports, think critically, and solve problems. The students learnt in a cooperative learning environment where they worked collaboratively in their projects to solve their problems. The teacher acted as co-learners as they shared learning the projects. The students showed great enthusiasm for sharing their knowledge and learning to work independently. Formative and summative assessment methods in the form of monthly quizzes, class assessments, oral discussions, and final term exam, were used during and after the experiment.

Procedures for integrating PjBL with ESP in a dental classroom

In the light of the findings of the needs analysis, interviews, and tests, an integrated PjBL dental vocabulary ESP course was designed to meet the ESL learners' needs, wants, and lacks. The dental course was introduced to the students within project-based learning strategies. The following is an example of a unit and task designed for the dental course:

1-Project's title: Fixing an appointment with the dentist

2-Duration: Two consecutive weeks. Classes were held every Wednesday and Thursday at 10.00 am (2 hours a day).

3-Objectives: After the completion of the project, students would be able to:

- i. Recognize new dental vocabularies in reading passages.
- ii. Use them in writing assignments.
- iii. Communicate using dental vocabularies.
- iv. Practice self-learning and co-operative learning.
- v. Foster their roles in a PjBL classroom.

3-Techniques: Innovative techniques applicable in the PjBL approach included co-operative learning, problem-solving, peer and group coaching,... etc. were used throughout the program. Other techniques experimented included individualized learning and activity-based learning methods. Under these techniques, the students worked individually as well as collaboratively to accomplish their projects.

4-Students' and teachers' roles in a PjBL classroom: A PjBL approach requires a cooperative learning environment, with the change in the role of both the teacher and the students. Instead of being dominant and aggressive, teachers guide, coach and mentor their students and teach them how to ask questions, collect data, debate, discuss, take notes, write reports, think critically, and solve problems. The students showed great enthusiasm for sharing their knowledge and learning to work independently.

5-Assessment: Assessment methods in the form of monthly quizzes, class assessments, oral discussions, and end of term exam, were used.

Results

Data of the questionnaire are shown in table one, appendix one, using the frequency of responses and weighted percentages.

According to the results of the questionnaire, items that received a higher weight percentage than others expressed the participants' needs and wants, therefore, are the main corpus of the ESP course. Participants showed an interest in learning dental vocabulary through PjBL techniques that would facilitate authentic and contextualized learning. Moreover, it would foster group and self-learning as well as develop critical thinking and problem-solving skills.

Statistical differences between the scores of the pre-and post-application of the vocabulary test are analyzed by using "t Independent Samples Test." Results are interpreted to the research hypothesis. Table two shows the statistical value of the mean scores of the pre and post vocabulary tests.

Table 2. Means and (t) value of the pre and post scores of the vocabulary test

Intervention	N	Mean	Paired		T	DF	Tab.T	Sig. (2-tailed)
			<u>Differences</u> d	D2				
Pre	14	7.9	17.32	2173,55	20,21	39	237	0.03
Post	14	22.1						

Table two shows that the calculated 't' (20, 21) is more significant than the tabulated 't' (237) at the degree of freedom (39), and this is significant at 0.03 level. This proves the validity of the research hypothesis "There are significant statistical differences between the scores of the pre and post-tests in the English dental vocabulary test in favor of the post-test." Results indicate that participants' performance improved after participating in the proposed ESP PjBL course.

To investigate ESL students' needs, wants, and lacks, and the benefit of the ESP course in improving their dental vocabulary acquisition, structured interviews were conducted with their instructors. Analysis of the interviews indicates that almost all respondents agreed that the course meets the students' language needs in respect to their academic studies. Tables three and four, appendices b and c, consecutively, show the instructors' responses concerning ESL students' needs, lacks, and the benefit of the ESP course. The instructors' responses to the students' needs and lacks showed high agreement on the students' needs to a specialized course with an innovative teaching strategy. Results, as indicated in table three, show a consensus among instructors that the current sample requires an ESP course that provides them with the knowledge needed provided that it is presented in the framework of updated techniques that keep the students motivated. Moreover, due to the nature of the current sample as ESL learners, general English language skills would be automatically communicated but without teaching them. K-W test and the Mann-Whitney test were used to analyze the results of the interviews.

Moreover, table four shows high percentages for dental vocabulary acquisition skills, which proves tangible improvement achieved on that level. Improvements were identified equally on the four language skills of dental reading, writing, listening, and speaking. This also proves the effectiveness of the ESP integrated course in improving dentistry features on the level of these skills. Grammar came last in rank since the ESP course focused mainly on dental vocabulary, and any improvement in this skill may be attributed to the solid background of the participants.

From the above results, it can be concluded that the ESP integrated course is essential for the students' academic and professional careers. Moreover, the students have developed not only, dental vocabulary acquisition, but also other language skills through using dentistry vocabulary. Therefore, students became capable of understanding a passage written with dental vocabulary. They became capable of using dental vocabulary in their speech. They became capable of writing passages using dental vocabulary. Finally, they became capable of construing all this through a good command of English grammar.

Discussion

The present study aimed mainly at testing the extent to which integrating PjBL strategies into an ESP course may affect the instruction of dental vocabulary for ESL Malaysian majors. First of all, a needs analysis questionnaire was distributed among the students to come to their needs, wants, and lacks. After classifying the students' needs and lacks, a dental vocabulary test was introduced to them to assess their current level in the skills in question. Supported by interviews with their instructors in the department, the researcher provided features to the ESP course. The course did not address the theoretical syllabus that introduced to the students in a silly, annoying manner. However, with the technological and scientific demands of the current century, innovative strategies, represented in PjBL techniques, were integrated into the instruction of the ESP course. Based on the fact that the sample of the study, ESL Malaysian students, has a good command of the English language, no efforts exerted in the field of improving their general English skills. The ESP course introduced to them was in the form of activities that required their involvement in

collaborative-project work to develop their dental vocabulary acquisition.

The findings of the study showed the effectiveness of integrating PjBL techniques in the instruction of dental vocabulary instruction. Such strategies created an atmosphere of cooperation and creativity among the students that stimulated them to work together to reach one final result for each project they share. Moreover, they promoted autonomously and self-motivated learning in which students learn at their pace without teacher dominance or traditional methods of teaching. This comes in line with (Brush and Saye, 2000) who found that project-based learning activities create co-operative spirits among the students as well as encourage their self-direction learning. Teachers also get positive attitudes towards incorporating PjBL techniques in the instruction process as they promoted "hands-on" experience.

These findings also come in line with Grant, (2002), Bransford and Stein (1993); and Vygotsky (1978) who stated that incorporating project-based learning activities in learning help students to understand concepts fully, connect ideas, apply their learning to real situations, deeply analyze concepts, and arrange their thoughts. Finally, it is a process of learning that enables students to give meaning to real-life situations.

Yetkiner, et al. (2008) affirmed the positive impact of incorporating PjBL as a model of teaching in the instruction of mathematics and other courses to develop concept analysis and connection of ideas through the promotion of a creative problem-solving atmosphere.

Conclusion

The findings of the present study conclude the importance of using innovative teaching methods in the teaching/ learning process. New generations are wanting to a positive climate to work co-operatively to generate ideas and to promote self-learning (Hackett 1985; Hall & Ponton 2005; Pajares and Miller 1994). Techniques used in the classroom to distribute the work, divide the students into groups, select the materials, make discoveries and solve problems contribute to the actual learning process, and add more positive attributes to the students' characters in the classroom. Therefore, incorporating PjBL techniques in teaching dental vocabulary fostered student- to- student and student- to- teacher's relationship. In this way, they are achieving the objectives of the study, encouraging the students to work in an enjoyable atmosphere that leads automatically to raise their academic performance.

Therefore, current streams in teaching highly support the attention paid to improving curricula, high-quality instruction, content area, students' assessments, and evaluation in the light of innovative teaching pedagogical methods. 21st-century learners are aspiring to a type of education that addresses their curiosity, promote their creativity, and provide them with inquiry-based approaches that answer their questions and lead to unique discoveries. Equipping learners with that type of education would lead to economic, technological, and scientific growth of the whole universe.

Therefore, students' spirits of discovery and research should be cultivated in all learning climates. Portraying, planning, role-distribution, and implementing projects are dual responsibility of both the teachers and the students. Also, their desire, readiness, and

willingness to work out such projects are their responsibilities (Gordon, 2000).

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References:

- Anthony, L. (1997). English for specific purposes: What does it mean? Why is it different? Retrieved from <http://www.antlab.sci.waseda.ac.jp/abstracts/ESParticle.html>
- Autodesk Foundation (1999). Kids who know and do. Program for the 7th Annual Conference on Project-Based Learning, San Francisco. San Rafael: Autodesk Foundation. <http://www.autodesk.com/foundation/>
- Beare, K. (2012). How many people learn English globally? Retrieved from http://esl.about.com/od/English_learning_resources/f/f_eslmarket.Htm
- Belcher, D. (2006). English for specific purposes: Teaching to perceived needs and imagined futures in worlds of work, study, and everyday life. *TESOL Quarterly*, 4(1), 133-156. <https://doi.org/10.2307/40264514>
- Blachowicz, C.L., & Fisher, P. (2005). Integrated vocabulary instruction. Learning point associates. Retrieved from <http://.learninggpt.org>
- Bradley- Levine, J., et al (2010). What teachers and administrators need to know about project-based learning implementation? Paper presented at the Annual Meeting of the American Educational Research Association. Denver, Colorado.
- Baumgartner, E., & Zabin, C. (2008). A case study of project-based instruction in the ninth grade: A semester-long study of intertidal biodiversity. *Environmental Educational Research*, 14(2), 97-114. <http://dx.doi.org/10.1080/13504620801951640>
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39-43. <https://doi.org/10.1080/00098650903505415>
- Beneke, S., (2000). Implementing the project approach in part-time early childhood education programs. *Early Childhood Research and Practice*, 2(1). <https://www.researchgate.net/publication/26390877>
- Blumenfeld, P. C., et al (1991). A Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3 & 4), 369-398.
- Bowen, E. R. (2009). Student engagement and Its relation to quality work design: A review of the literature. *Action Research Exchange*, 2(1). Retrieved from <http://artofeducating.com/-library/classroom>
- Bransford, J. D., & Stein, B. S. (1993). *The IDEAL Problem Solver* (2nd ed.). New York: W. H. Freeman and Company.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher* 19(1), 32-42.

- Brush, T., & Saye, J. (2000). Implementation and evaluation of a student-centered learning unit: A case study. *Educational Technology Research & Development*, 48(3), 79-100.
- Clark, Ann-Marie (2006). Changing classroom practice to include the project approach. *Early Childhood Research and Practice* 8(2). eric.ed.gov. id=EJ1084959
- Coffey, B. (1985). *English for specific purposes*. In V. Kinsella, (Ed.), *Cambridge Language Surveys* (Vol, 3, pp. 78-93). Cambridge, UK: Cambridge University Press.
- Dewey, J. (1986). Experience and education. *The Educational Forum*. 50(3), 241-252.
- Dovey, T. (2006). What purposes, specifically? Re-thinking purposes and specificity in the context of the “new vocationalism”. *English for Specific Purposes*, 25 (4), 387-402. DOI: 10.1016/j.esp.2005.10.002
- Dodge, B. (1998). WebQuests: A Strategy for scaffolding higher-level learning. *Paper presented at the National Educational Computing Conference*, San Diego, June 22-24, Retrieved from <http://webquest.sdsu.edu/necc98.htm>.
- Dodge, B. (1997). Some thoughts about WebQuests. Retrieved from http://www.edweb.sdsu.edu/course/edtect596/about_WebQuests.html.
- Dudley-Evans, T. A. & St. John, M. J. (1998). *Developments in English for Specific Purposes*. Cambridge, UK: Cambridge University Press.
- El-Bahi, F. (1979). *Psycho-metric and Measuring Human Mentality (2nd Ed.)*. Cairo: Dar Al-Feker Al-Araby (In Arabic).
- Ewer, J. R. & Latorre, G. (1969). *A Course in Basic Scientific English*. London, UK: Longman.
- Flowerdew, J. (1990). English for specific purposes: A selective review of the literature. *English Language Teaching Journal*, 44(4), 326-337. DOI:10.1093/elt/44.4.326
- Flowerdew, J. & Peacock, M. (2001). *Research Perspectives on English for Academic Purposes*. Cambridge: Cambridge University Press.
- Fortanet-Gomez, I. & Raisanen, C. A. (2009). ESP in higher European education: Teaching language and content. *English for Specific Purposes*, 28 (3), 211–213. DOI:10.1016/j.esp.2009.01.002
- Gordon, T. L. (2000). *Identifying Ekvall’s creative climate dimensions in an elementary school classroom setting*. Unpublished Master’s project, Buffalo, NY, Buffalo State College, Center for Studies in Creativity,
- Grant, M.M., (2002). Getting a grip on project-based learning: Theory, cases and recommendations. *Merridian: A Middle School, Computer Technologies Journal*, 5(1), 1-17.
- Gut, D. M. (2011). *Integrating 21st Century Skills into the Curriculum*. In Wan, G., & Gut, D. M. (eds.), *Bringing Schools into the 21st Century (Explorations of Educational Purposes)* (Vol. 13, pp. 137–157). Dordrecht: Springer Netherlands.
- Hackett, G. (1985). The role of mathematics self-efficacy in the choice of math-related majors of college women and men: A path analysis. *Journal of Counseling Psychology*, 32, 47–56.
- Hall, J., & Ponton, K. (2005). Mathematics self-efficacy of college freshman. *Journal of Developmental Education*, 28(3), 26–33.
- Hannafin, M., Hall, C., Land, S., & Hill, J. (1994). Learning in an open-ended learning environment: Assumptions, methods, and implications. *Educational Technology*, 34(8), 48-55.

- Hannafin, M., Land, S., & Oliver, K. (1999). Open learning environments: Foundations, methods, and models. In C. Reigeluth (ed.), *Instructional design theories and models*, (Vol. II, pp. 115-140), Mahwah, NJ: Erlbaum.
- Hannafin, M. J & Land, S. M. (2000). Technology and student-centered learning in higher education: Issues and practices. *Journal of Computing in Higher Education*, 12, 3-30. DOI: <https://doi.org/10.1007/BF03032712>
- Henton, M., (1996). *Adventure in the Classroom: Using Adventure to Strengthen Learning and Build a Community of Life-Long Learners*. Project Adventure, Hamilton, MA. Kendall/Hunt Publishing.
- Hutchinson, T., & Waters, A. (1987). *English for Specific Purposes: A Learning-Centered Approach*. Cambridge, UK: Cambridge University Press.
- Jackson, S. (2015). What I learned from an old kickboard and dental floss. Retrieved from <http://remakelearning.org/tag/projectbased-learning>
- Javid, C. Z. (2015). English for specific purposes: Role of learners, teachers, and teaching Methodologies. *European Scientific Journal, ESJ*, 11(20). Retrieved from <http://eujournal.org/index.php/esj/article/view/5950>
- Johns, A. M. & Price-Machado, D. (2001). *English for Specific Purposes: Tailoring Courses to Student Needs and to the outside World*. In M. Celce-Murcia (ed.), *Teaching English as a Second or Foreign Language* (pp. 43-54). Boston, MA: Heinle & Heinle.
- Jones, B. F., Rasmussen, C. M., & Moffit, M. C. (1997). *Psychology in the Classroom: A series on applied educational psychology. Real-life problem solving: A collaborative approach to interdisciplinary learning*. American Psychological Association. Available at <https://doi.org/10.1037/10266-000>
- Kennedy, C. (2001). *Language Use, Language Planning, and EAP*. In J. Flowerdew & M. Peacock (eds.), *Research Perspectives on English for Academic Purposes* (pp. 25-41). Cambridge, London: Cambridge University Press.
- Lave, J. (1990). *The Culture of Acquisition and the Practice of Learning. Cultural Psychology: Essays on Comparative Human Development* (pp. 259-286). Cambridge, UK: Cambridge University Press.
- Levstik, L. S., & Barton, K. C. (1997). *Doing History: Investigating with Children in Elementary and Middle Schools*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Little, D. (2009). *Learner Autonomy in Action: Adult Immigrants Learning English in Ireland*. In F. Kjisik, P. Voller, N. Aoki, & Y. Nakata (eds.), *Mapping the Terrain of Learner Autonomy: Learning Environments, Learning Communities, and Identities* (pp. 50-85). Tampere, Finland: Tampere University Press.
- Lorenzo, F. (2006). Teaching English for specific purposes (ESP). Retrieved from <http://www.usingenglish.com/teachers/articles/teaching-english-forspecific-purposes-esp.html>
- Markham, T. (2011). Project-based learning: A bridge just far enough. (FEATURE ARTICLE). *Teacher Librarian*, 39(2), 38-42
- Mohan, B. A. (1986). *Language and Content. Reading*. MA: Addison-Wesley.
- Noom- ura, S. (2013). Project-based learning and ESP: A perfect match. *English language teaching*, 31(3), 1-7.

- Pajares, F., & Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. *Journal of Educational Psychology*, 86(2), 193–203. <https://doi.org/10.1037/0022-0663.86.2.193>
- Rajeswaran, M. C. (2018). Approaches to teaching English for specific purposes (ESP) in engineering programs. *IUP Journal of English Studies*. Vol. XIII, No. 3
- Ritz, S. (2014). Project-based learning is the conduit for progressive change. *Buck Institute for Education*. http://bie.org/blog/project_based_learning_conduit_progressive_change
- Richards, J. (2006). *Communicative Language Teaching Today*. Cambridge, New York: Cambridge University Press.
- Salazar, Z. E., & Carballo, C.O. (2010). Can the students in an ESP course learn new vocabulary as they review and practice it by playing a computer game? *Revista de Lenguas Modernas*. <http://revistas.ucr.ac.cr/index.php/rlm/article/view/9476>
- Salomon, G., & Perkins, D. N. (1996). *Learning in Wonderland: What Computers Really Offer Education?* In S. Kerr (ed.), *Technology and the Future of Education*. (pp. 111-130). NSSE Yearbook. Chicago: University of Chicago Press.
- Schmitt, N. (2000). *Vocabulary in Language Teaching*. Cambridge: Cambridge University Press.
- Stanley, T. (2012). *Project-Based Learning for Gifted Students: A Handbook for the 21st-Century Classroom*. Waco, Tex: Prufrock Press Inc.
- Stevens, P. (1980). *Teaching English as an International Language: From Practice to Principle*. Oxford, New York: Pergamon Press.
- Stevens, P. (1977). Special purpose language learning: A perspective. *Language Teaching and Linguistic Abstracts*, 10(3), 145-163. DOI:10.1017/S0261444800003402
- Sysoyev, P. (2000). Developing an English for specific purposes course using a learner-centered approach; A Russian experience. *The Internet TESL Journal*, 6(3), 12-21.
- Villalobos, O.A., Díaz-Ducca, J. A. (2017). ChemCourse: Design of an ESP course for chemists and chemistry students. *Revista de Lenguas Modernas*. DOI: 10.15517/rlm.v0i25.27693
- Vygotsky, L. (1978a). *Mind in Society: The Development of Higher Psychological Processes*. Vol. 3. Cambridge, MA: Harvard University Press.
- Vygotsky, L., (1978b). *Mind in Society: Interaction between Learning and Development*. Cambridge, MA: Harvard University Press
- Watts-Taffe, S., & Truscott, D. M. (2000). Using what we know about Language and Literacy Development for ESL Students in the Mainstream Classroom Language. *Language Arts*, 77, 258-265.
- Yetkiner, Z. E., Anderoglu, H., & Capraro, R. M. (2008). Research summary: Project-based learning in middle grades mathematics. Retrieved from <http://www.nmsa.org/Research/ResearchSumaries/ProjectBasedLearninginMath/tabid/1570/Default.aspx>
- Zengin, B., Erdogan, A. R. & Akalin, S. (2007). Acquisition of Latin roots with implications for EAP. *Journal of Language and Linguistics Studies*, 3(1), 11-31. Retrieved from <http://www.jlls.org>.

Appendix A

Table (1). Percentages of students' responses to the needs analysis questionnaire

No.	Items ESP dental skills needed.	Not Important at all (NIAL)	Less Important (LI)	Important (I)	Greatly Important (GI)	Percentages
1	Use the new dental terms in all four language skills.	0	0	0	14	4.00
2	Use the dental terms in professional communication.	0	0	0	14	4.00
3	Write short situations using the dental terms.	0	0	0	14	4.00
4	Exchange questions and answers about dentistry.	0	0	0	14	4.00
5	Use vocabulary related to dentistry correctly.	0	0	0	14	4.00
6	Predict and brainstorm new vocabulary related to dentistry.	0	0	3	11	3.02
7	Act the role of dentists using new vocabulary items.	0	0	5	9	3.00
8	Analyze a dental text for specific information.	0	0	5	9	3.00
9	Recognize the names of organs related to dentistry with their names and descriptions.	0	1	3	10	3.01
10	Experience the connections between the theoretical and practical application of dental vocabularies.	0	5	5	4	2.05
11	Make inferences from a text.	0	5	5	4	2.05
	PjBL techniques.					
12	Make learning authentic.	0	0	2	12	3.07
13	Foster co-operative learning.	0	0	2	12	3.07
14	Contextualize projects.	0	0	0	14	4.00

15	Develop critical thinking and creativity.	0	0	0	14	4.00
16	Simulation and role-play.	5	5	2	2	2.11
17	Take notes.	10	1	2	1	2.10
Topics covered in the ESP course.						
18	Fixing appointment with the dentist.	0	0	2	12	3.75
19	Dental advices.	0	0	3	11	3.23
20	Teeth complains and dental vocabulary.	0	0	1	13	3.34
21	Dental Check- up.	0	0	3	11	3.35
22	Tooth decay.	0	0	1	13	3.43
23	Preventing tooth decay.	0	0	2	12	3.75
24	Health and Sickness.	0	0	2	12	3.75
25	Importance of a healthy mouth.	0	0	4	11	3.35
26	Teeth structure and types.	0	0	2	12	3.40
27	Brushing and flossing.	0	0	3	11	3.35
28	Dental Hygiene.	0	0	1	13	3.43
29	Dialogues; questions by the patients and advice by the dentists.	0	0	2	12	3.75
30	Word formation; nouns and verbs.	2	2	1	9	2.10
31	Opposites; prefixes and suffixes.	2	2	0	10	2.20
32	Word association; mind maps.	3	3	0	8	1.80
33	Reading comprehension passages.	0	0	6	8	1.80

Appendix B

Table (3). *Weighed percentage of the instructors' responses to ESL students' needs, wants and lacks*

No.	Items	Not Important at all (NIAL)	Less Important (LI)	Important (I)	Greatly Important (GI)	Percentage
1-	To what extent do you think the ESP course is	0	0	2	8	80.0

	essential for the students' academic study?					
2	To what extent do you think the ESP course is essential for the students' professional careers?	0	0	0	10	100.0
3	To what extent do you think the ESP course is essential for improving the students' four language skills?	0	0	2	8	80.0
4	To what extent do you think it is crucial that the ESP course should focus mainly on dental vocabulary?	0	0	0	10	100.0
5	To what extent do you think it is crucial that the ESP course should focus on general English?	9	0	1	0	90.0
6	How important do you believe is the use of innovative teaching/learning methodologies in the current ESP course?	0	0	0	10	100.0
7	How important do you believe is the use of supplementary materials in ESP English classes?	0	0	0	10	100.0
8	To what extent do you think it is crucial that students be allowed to work collaboratively in ESP classes?	0	0	0	10	100.0
9	To what extent do you think it is crucial that students be fluent in both oral and written dental English?	0	0	0	10	100.0

Appendix C

Table (4). *Instructors' responses to the benefit of the ESP course in improving their students' ability in the mentioned skill/area (frequency & percentage)*

Rating levels	Listening		Speaking		Writing		Reading		Grammar		General Vocabulary		Dental Vocabulary	
	Fre q.	%	Fre q.	%	Fre q.	%	Fre q.	%	Fre q.	%	Fre q.	%	Fre q.	%
Not Helpful at all	0	0	0	0	0	0	0	0	0	00.0	7	70.0	0	0
Less Helpful	0	0	0	0	0	0	0	0	5	50.0	2	20.0	0	00.0
Helpful	2	20.0	2	20.0	2	20.0	2	20.0	2	20.0	1	10.0	0	00.0
Very Helpful	8	80.0	8	80.0	8	80.0	10	100.0	5	50.0	0	00.0	10	100.0