Students' perceptions of the interdisciplinary collaboration on English reinforcement

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ABSTRACT

The purpose of this study is to explore the effects of interdisciplinary collaboration on English reinforcement. It will investigate how a general English class can be integrated into a class involving English for specific purpose. 68 participants from two different sources, English and non-English programs, conducted projects collaboratively based on their majors and interests. Non-English program students were asked to present the results of their group projects in English orally. At the same time, English program students had to compose writing essays to describe what they had learned from the subjects they joined. In the findings, it shows that students better understood subject topics after conducting them in person. In addition, they became aware of specific English terminology concerning their fields. In contrast, English program students could compose understandable writing texts if they well comprehended the subject topics they engaged, or, they failed to describe what their projects were about. It indicates that connecting English and non-English programs is a way to help both parties develop their specific disciplinary knowledge and English competency when the subject topics are popular and more general to the public.

Key words: General English, English writing, English for specific purpose, interdisciplinary collaboration.

INTRODUCTION

There are two purposes for conducting this research project: one is to help English program students learn some specific disciplinary knowledge and develop their English writing skills in general through participating into the group projects conducted by non-English program students. Another goal aims at helping non-English program students learn some disciplinary terminology in English.

The teacher/researcher presumes that English program students can learn how to describe specific subject topics in written texts legibly if they are able to comprehend the knowledge which is related to specific disciplinary fields. In contrast, non-English program students can be aware of some disciplinary terminology in disciplinary courses if they are asked to present specific projects in English versions. This may encourage them to explore knowledge of other subjects in English at a later time.

By means of carrying out the interdisciplinary and collaborative projects, English learning becomes more realistic and practical. English program students may not only broaden their disciplinary knowledge vision, they also may gain opportunities to practice how to transform the knowledge learned from their counterparts into written texts. Many media, such as TV news and newspapers in Taiwan constantly emphasize the importance of possessing a second specialty in a specific disciplinary field. Although, students need sufficient time and specific writing instruction to achieve satisfactory outcomes, by means of conducting the interdisciplinary project, students may hopefully further their disciplinary knowledge and English competency simultaneously.

In general, students attending the technological university in Taiwan are required to take an English course
at the first and/or second years of college. The course usually focuses on general purpose and, mostly, is offered by English teachers. Other than general English offering, some programs may take English as the medium of instruction and textbooks on certain disciplinary courses in English version so as to reinforce students’ English competency on specific subject matters. Other programs may conduct their disciplinary courses all in Chinese, depending on teachers’ requirements and students’ needs.

Relatively, English writing is one of required courses that English program students are required to take. Followed by the teacher’s instruction, students open the door and enter the writing world step by step. In this study, different from traditional general English learning fashions by sitting, taking notes, and receiving passively; based on students’ interest and their relevant specific programs, students were asked to conduct group projects after class. Fifty non-English program students from six different majors assigned at the same English class based on their English placement test, and eighteen English program students who were taking English writing class joined in this project.

Based on specific disciplinary categories, non-English program students were equally divided into two groups: control and experimental groups to examine the effects of English performance assisted by English program students. Each groups consisted of six different majors. Eighteen English program students were assigned to join experimental groups evenly. Students spent one semester to conduct their disciplinary group projects.

**LITERATURE REVIEW**

Advanced technology has made great strides towards improving human life. It also influences the purposes and requirements of English learning. In the past, English education in Taiwan mainly focused on general purpose uses. Therefore, English teachers would mainly concentrate on reinforcing EFL learners’ four basic skills (speaking, listening, reading, and writing). Currently, students are expected not only to possess general English proficiency, they also urgently need to learn their subject courses in English versions so that they can perform effectively in the international forum. Due to growing concerns about the ESP requirement and concerns for effectively meeting students’ needs, the contents English teachers must use in their classrooms are becoming increasingly diverse. For instance, they may have to help students who major in management fields improve the English terminology as it relates to management so that they can gain and use specific subject knowledge as it is presented in an English format.

In a similar example, students who major in Tourism will be required to know how to articulate the subject matters pertaining to that field in English. According to Widdowson (1998), an ESP program is designed to instruct students in the effective use of the language which serves to further their professional career.

In addition, John and Price-Machado (2001) gave the definition and characteristics of ESP that ESP be designed to meet the specific needs of specific learners. Then, how will English teachers help students reach that goal if the teachers lack specific professional knowledge pertaining to a given field or occupation? Chang (2010) stresses strongly that teachers who teach specific subject courses need to possess required professional certification so that they can serve as truly qualified teachers. Thus, while working with students on specific subject, EFL teachers should have broad based ESP certification. He emphasized that EFL teachers should address real life situations and orient their teaching to meet students’ needs. He also suggested that EFL teachers can form a team teaching mode with teachers from a variety of disciplinary areas in ESP programs.

In addition to possessing professional certification, EFL teachers still have to take other aspects into account so that they can conduct their ESP programs effectively and appropriately. Many studies have demonstrated how ESP programs have been conducted. In the study, Liang (2007) described an ESP course for Leisure Management students. She used a variety of methods and materials to actively engage the students in the learning process. She pointed out that students not only had language achievement, they also gained better knowledge of their future professions and the local cultures.

Chaikul and Sugino (2008) provided some of the activities that were conducted in their English classes at a Fashion College and a Cadet School. The aim at the first was to enhance students’ speaking skills and to adequately serve their fashion interests. At the Cadet School, the students learned about appropriate technology and refugee problems in the world. They indicated that their students had positive attitude toward English language learning that was especially designed for them. Similar to the studies illustrated earlier in this study, by means of collaborating with students from English department, the researcher will attempt to help students improve their specific subject course knowledge and subject related English competency. Students will employ authentic materials or ideas to demonstrate their project performance as it relates to their specific field, in English.

Authenticity has been understood in general English learning programs as using authentic reading materials, but in ESP, authenticity requires far more than this. McDonough (1984) defines the term “authenticity” to include authentic language input, authentic tasks, and events. Belcher (2006) also advocated that ESP material design should include both authentic texts and tasks.

However, it may cause problems while employing the authentic texts. For instance, the less proficient English students may have difficulty in comprehending the contents described in the materials that are presented to them. And, some students may not have the background knowledge;
Therefore, the specialized contents are too difficult for them to learn. As a result, both instructors and students feel frustrated and discouraged.

Therefore, through a needs analysis (NA) process, teachers may have a well planned course to adequately fulfill students’ specific needs. More recently, task-based NAs are gaining attention (Gilabert, 2005; Long and Norris, 2000). In Taiwan, a large-scale project was undertaken by means of using NA process to design adequate courses for ESP. Tsou (2009) pointed out in her study that in 2007, National Cheng Kung University firstly established an ESP program to reform sophomore English.

In this study, in order to avoid the factor of uncertainty, basically, the students will provide the contents which they intend to learn and complete their projects collaboratively, and teacher will contribute her language skills when necessary. Moreover, in this study, the researcher will employ the project-based learning strategy to help students explore the specific disciplinary subjects and present them in English. Many researchers designed projects involving complex tasks, based on challenging questions or problems, that involved students in design, problem-solving, or decision making. In addition, they gave students the opportunity to work relatively autonomously over extended periods of time, which culminated in realistic products or presentations (Jones et al., 1997; Thomas et al., 1999; Stoller, 2007). By means of the project-based learning, hopefully, students can successfully integrate their general English skills to English for specific purpose uses.

The researcher attempted to realize the effects of collaborating English program students with non-English program students on disciplinary knowledge development, English competency reinforcement and English writing skills insights. This study sought to examine the following broad questions.

**Research questions**

- What did English program students learn on the interdisciplinary projects?
- What perspectives did English program students have upon the interdisciplinary projects?
- What did non-English program students learn through conducting group projects on specific subjects?
- What perspectives did non-English program students have upon the disciplinary projects demonstrated in English oral and written reports?

**METHODOLOGY**

This study adopted qualitative approaches so that the data were based on many sources. These included: pre and post open ended questionnaires, an in-progress survey, in-progress group discussion reports, and semi structured interview in order to triangulate the validity of the data analysis. This research project will use action research as a way of investigating how a general English class can be integrated into a class involving English for specific purpose.

Action research has been around for over 50 years. It was first developed in the social sciences (the sociologist, Kurt Lewin coined the term action research), and has been deployed in many diverse situations. It provided a boost to education practice in the 1960s and 1970s (cited from Bailey et al., 2001: 135). Mattingly (1991: 255) explained that “In action research, the ‘subjects’ are no longer subjects but rather find a way to become researchers of their own practice”.

In addition, Nunan (1992: 229) claimed that action research has been characterized as “a form of self-reflective inquiry carried out by practitioners, aimed at solving problems, improving practice, or enhancing understanding". The subject course, titled General English, has been taught for years at the college where the researcher intends to undertake this study.

In general, students do not have satisfactory outcomes in their English performance. For example, it is difficult for most of them to pass the official English proficiency tests and earn the basic level certification. Many of them cannot even articulate completely the English title for their department. It seems that English learning is less meaningful to them. In contrast, English teachers are commonly accused by the administrators as not being able to help students improve English competency. As a consequence, teachers gradually lose their sense of accomplishment and may suffer a decrease in their enthusiasm for teaching. Thus, the researcher intends to use action research as a way to find a means to motivate students to learn English for specific purpose.

**Research site**

The research site is at a technological college which is located in the center of Taiwan. In this college, non-English program students are obliged to take the course titled, General English, for three consecutive semesters. It is a required two-credit-hour course and is divided into three levels namely; A, B, and C. Students took a placement test and then, were assigned in the certain class at the first semester. In this study, in addition to attending the regular English classes, students would work on their group projects with their team members after class. The research site is located inside the classroom, school library, computer laboratory, and a number of conference rooms.

**Participants**

In this study, participants will be drawn from two different
Table 1. The number of students in each group, departments and number of students.

<table>
<thead>
<tr>
<th>Department</th>
<th>Control groups</th>
<th>Experimental groups</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>2</td>
<td>HR (2) + AE (3)</td>
<td>5</td>
</tr>
<tr>
<td>MDM</td>
<td>4</td>
<td>MDM (6) + AE (3)</td>
<td>9</td>
</tr>
<tr>
<td>FM</td>
<td>3</td>
<td>FM (3) + AE (3)</td>
<td>6</td>
</tr>
<tr>
<td>IM</td>
<td>5</td>
<td>IM (6) + AE (3)</td>
<td>9</td>
</tr>
<tr>
<td>DMD</td>
<td>5</td>
<td>DMD (6) + AE (3)</td>
<td>9</td>
</tr>
<tr>
<td>INT</td>
<td>3</td>
<td>INT (5) + AE (3)</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td></td>
<td>46</td>
</tr>
</tbody>
</table>

In order to realize the extent of English competency integrated with English program students, the participants were divided into two groups: control and experimental groups. Each group contained 6 subgroups which were subsequently divided on the basis of the department; that is, students from the same department were placed in the same group. In the meantime, 18 students from an English program (Applied English, AE) were enrolled in the course of English Writing and were joined by 6 individual experimental groups.

The English major students were all sophomores who had been in the same class since they entered the English program. They had taken the course of General English which was offered by the English program in their freshman year and most of them had earned good grades. They were allowed to form their own groups by themselves and were asked to limit their teams to three members. Then, they were assigned into six different groups which consisted of non-English program students assigned at random. The arrangement of the groups is illustrated in Table 1.

In order to explore the effects of disciplinary terminology learning and English writing skills reinforcement through the collaboration with English and non-English program students, the data sources collected were from two divisions: English and non-English programs. Students were asked to complete pre and post open ended survey questionnaires.

In the process of conducting the projects for specific purpose through the interdisciplinary collaboration, non-English program students were the key characters and students from the English program were in the minor position. Because of different learning goals, the contents of pre and post questionnaires given to English and non-English program students were different. While group projects were conducted in the halfway, non-English program students particularly were asked to complete an in-progress survey to examine their projects involved with/without English program students.

In addition, all participants had to submit two in-progress group discussion texts and have one face-to-face conference with the researcher.

Feedback comments and final essay conducted by English program students

In the initial open ended questionnaire, students pointed out the possible means of assisting disciplinary program students to achieve their projects in English version and the group discussion atmosphere they experienced.

In addition, it also included the problems they had and the expectation for the interdisciplinary collaboration. The students were asked to respond to all questions in Chinese so that they could give their opinions freely and fully. At the end of the semester, students were asked to write a one-paragraph statement to describe the features of the projects they joined, the specific knowledge they learned, and their perspectives upon the interdisciplinary program.

The statement for instructing students to do the composition is illustrated as: Please describe what specific knowledge you have learned from the interdisciplinary program and what do you think about it. One-paragraph writing was the goal for the beginning writers to aim for. By means of conducting a collaborative interdisciplinary project, students were required to probe specific disciplines and put their learning into words. This demonstrated in time that the students had made many grammatical mistakes in their writing texts, but that the contents of their responses were stated fluently and comprehensibly. This indicated that students in general were capable of organizing their thinking into English written texts.

Survey questionnaires conducted by Non-English program students

Three kinds of open ended questionnaires were used as an
Table 2. The titles of group projects.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Project</th>
<th>Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>Control groups</td>
<td>Experimental groups</td>
</tr>
<tr>
<td>MDM</td>
<td>Creative thinking</td>
<td>Educational training</td>
</tr>
<tr>
<td>FM</td>
<td>Box store</td>
<td>Green marketing</td>
</tr>
<tr>
<td>IM</td>
<td>Router</td>
<td>Computers assembling</td>
</tr>
<tr>
<td>DMD</td>
<td>Figure design</td>
<td>Picasso’s paintings</td>
</tr>
<tr>
<td>INT</td>
<td>Cloud computing</td>
<td>Wire shark</td>
</tr>
</tbody>
</table>

instrument to gain information: pre-, in progress, and post survey questionnaires which were conducted at the first meeting, in the mid, and at the final meeting of the class. The contents of the questionnaires mainly focused on realizing the prior experiences on general English learning, perspectives upon disciplinary courses with English version texts, reflections upon integrating English into specific disciplinary uses, and feedback about collaborating with students from the English department.

In-progress group discussion reports

There were twelve groups in total conducting their projects simultaneously after class. In order to realize their work progress, all groups had to hold group discussions and send their minutes to the researcher through the e-mail. Thus, she would know what topics students were planning to do and how they would share the work items with their group members. When the projects were conducted in the halfway, again, another group discussion minutes had to be sent to the researcher.

Face-to-face conferencing

In order to present the entire picture of carrying out English for specific purposes and developing disciplinary knowledge, the researcher conducted interviews with administrators, assistants, teachers, and students who were involved in this study. By means of making phone calls, conducting online interviews, and face to face interviewing, the researcher acquired all the required data.

Titles of the projects conducted by groups

Non-English program students were encouraged to conduct the projects that were interesting and related to one specific course they were/had taking/taken in their department. They were divided into two categories: experimental and control groups. And, English program students would join the experimental one. There were twelve projects conducted by six departments. The titles of individual projects are illustrated in Table 2.

Procedures of conducting the study

In contrast to the traditional learning style, students as passive learning receivers and non-English program students were asked to conduct group projects in which they were asked to design a practical and useful project based on their specific disciplinary demands.

At the very first meeting, the participants were given a clear instruction on how to meet the requirements for the general English course. They not only had their regular general English class, in particular, they also had to conduct group projects with specific disciplinary purpose after class. In addition to completing pre and post survey questionnaires, conducting in-progress group discussions, and interviewing, as the project was approaching to its end, non-English program students were asked to give an oral presentation in English by groups, in order to examine what extent their English achieved and share their works with one another. Oppose to presenting their outcomes through oral and visual demonstrations in English, individual English program students were asked to write an English essay to describe their understanding on specific disciplinary they participated in.

RESULTS AND DISCUSSION

It was the first time for English major students to conduct the interdisciplinary project. The researcher presumed that if students could compose a comprehensible writing text about what the specific project which they participated was, it indicated that students not only learned the English writing skills; most importantly, they were also aware of certain disciplinary knowledge.

In contrast, in the process of conducting the projects and presenting them in English version assisted with or without English program students, non-English program students were expected to learn useful and practical English for specific disciplinary purposes. In this, what extent would students learn? And, how did they perceive this kind of learning fashion? In addition, what benefits could they gain
through the collaborative projects?

**Research questions exploration**

The following question will be discussed based on the final essays conducted by English program students.

**Research question 1**

What did English program students learn on the interdisciplinary projects? The following excerpts were quoted directly from students’ writing texts:

- “I learnt a lot of specialized terms which is about green environmental protection and also make lots of friends from other department; I promote my English skill.” (The project discussed about Green Marketing).
- “I understood the restaurant and how they train the staffs. On completion of the report, I thought of working in the community. I have to go through a period of long training.” (The project discussed about Educational Training).
- “After I cooperate with them, I learnt a lot about Picasso. They use their skills to draw Picasso’s pictures and also used computer hardware to finish their pictures. It is a great experience for us to learn what proper noun they use such as, layer, cutting line, and Gaussian blur etc” (The project discussed about Picasso’s Paintings).
- “I learned some basic information in computer with my partner such as: essential equipment in computer, equipment function, how to select high quality outfit and the importance of CPU in computer.” (The project discussed about Computer Assembling).
- “I learned a lot from interdisciplinary program, such as, proper nouns of computer and learnt how to be in concert with others.” (The project discussed about Wire Shark).

Among the six projects students were engaged in, three of them were described comprehensively and specifically by individual group members. The topics of the projects were about green marketing, educational training, and Picasso’s paintings. In the writing texts, they not only illustrated the specific terminology, they also explained what the subject topic was about. In contrast, the other three projects were not expressed understandably. Three writing texts could not even identify which project the writers were involved in and the topics of three projects were about computer assembling, Wire Shark, and stock analysis. One student kept complaining how boring and difficult the project was, but did not reveal the project she was engaged in. Another student would list several terminologies related to the topic but could not explain what functions the specific subject would generate.

Based on the level of comprehensibility presented on the writing texts, it indicated that some factors affected the extent students learned about the disciplinary knowledge. When the topics were popular, interesting, or easy to be understood to the general public, students could achieve their writing tasks smoothly.

In addition, the collaborative relationship with the counterparts and industrious attitudes towards the group projects were also important factors. For instance, one student indicated that she had no ideas about the meanings of Picasso’s paintings and how her counterparts made the duplicated one with specific software. She claimed that she knew them better after having group discussions with her counterparts. However, if the topic were too difficult to understand, students not only lost interest to learn, they also could not describe what it was in their writing. The topic about the stock analysis was one of such examples.

In addition, it seems that students from the liberal arts program have difficulties in being aware of the specific knowledge about computer science. Therefore, even though they indicated that they had learned specific terminologies, they could not explain how to assemble the computers with those complicated parts.

Students who participated in different groups resulted in different outcomes on their disciplinary recognition. In addition to gaining different levels of knowledge, the perspectives upon the interdisciplinary project would influence their interest and understanding of the projects. The question illustrated about the perspectives English program students had will be revealed based on their pre and post open ended questionnaire, in-progress group discussion minutes, and final essays.

**Research question 2**

What perspectives did English program students have upon the interdisciplinary projects? What factors would influence students’ perspectives upon the interdisciplinary collaboration? Most students had positive opinions on the interdisciplinary collaboration and indicated that they had learned a lot and “enrich” their knowledge by joining the project.

Also, by means of assisting non-program students to complete their project in English version, many English program students indicated that they could know how far their English could reach on disciplinary fields and believed that they could improve their English competency. However, several students indicated that they did not like it and doubted it would help them explore the disciplinary knowledge. For example, three students who participated in the project involved in stock analysis presented different responses about their accomplishments. One claimed, “We all think we do not learn anything about this activity, because we do not understand what they want to talk about.”

However, another student indicated that “we are responsible for translation. In the process of translation, I understand what they are doing.” The third student said, “After using the dictionary, I had a little bit knowledge of what they said. I also learnt how to analyze the stocks and
realized their technical terms." However, in her writing text, she also implied that "I hope next semester teacher do not request we do this again, this is too difficult." Thus, it indicated that some students might not get interested in conducting the interdisciplinary projects no matter what benefits they might gain.

In addition to the levels of difficulty, other factors also influenced their perspectives upon the collaborative project. One student indicated that it was her first time to work with 'strangers.' Another uttered, "I do not really like to do this, and our time is very difficult to match each other; and I do not like this work, it is not interesting to me at all." Thus, stranger-like partnership and time consuming were factors that would influence English program students on processing their collaborative projects.

Interestingly, opposed to the feedback about no more interdisciplinary collaboration, one student indicated that "next time I hope we could cooperate with other department to realize more about specific knowledge to them." And, another student pointed out that "we hope we can have similar activities next time. Maybe it is taking a lot of time, but we can learn many things." In her text, she reflected that she had a wonderful time to cooperate with people from specific disciplinary subject. Although, she was not familiar with it, she enjoyed learning from her counterparts.

In conclusion, although, English students appeared positive and had negative opinions about the fashion of interdisciplinary collaboration, all of them devoted themselves to assisting their counterparts to resolve English problems. As a matter of fact, in the process of attempting to figure out specific proper terms, it may be helpful for English program students to develop their knowledge about subject matters. In contrast to English program students learning of specific disciplinary subjects, what non-program students learnt about specific subject topics were related to their majors through the group collaboration. The following two questions will be discussed based on students’ feedback from their pre, in-progress and post surveys.

Research question 3

What perspectives did non-English program students have upon the disciplinary projects demonstrated in English oral and written reports? At the first meeting, students were stressful and nervous when they learnt that they required conducting group projects and had a final oral presentation in English. It is true that it was a giant challenge for non-English program students to commit such a tough task while they used to take English class in a silent way, that is, they just sit in the class to receive the lesson passively. They had rare opportunities to practice their English orally. They doubted that they could achieve the designated task successfully. However, all students unquestionably completed their English oral presentation on time. They indicated in their feedback that they felt a great sense of accomplishment to
complete a group project which they thought they could not do at the beginning. In the process of translating their texts from Chinese into English, they claimed that they had learnt a lot of English terminologies which they were unaware of before. It was very difficult for them to conduct the translation at the beginning; however, it became easier afterward.

In addition, they could better understand the English texts while they were searching for the information in the Internet. Most students agreed that the projects presented in English fashion could help them improve their English because they needed to search for the answers in person. Thus, the actions of ‘digging in’ would leave in their minds and have deeper memory on it. Would it be different on English performance between the control and experimental groups?

In this study, all groups successfully completed their projects in English. Thus, would they have better performance assisted by English program students? How about the groups without English support? When students were asked if English program students could make the projects in English easier? Most students in the experimental groups gave positive opinions. Only the group conducting the computer assembling denied the assistance provided by English program students. At this point, it seems that it was correspondent with its counterpart group. However, two other groups conducted the topics about stock analysis and wire shark, they had opposite opinions on English contribution given by English program students. Interestingly, while non-English program students appreciated the support from their counterparts; in contrast, English program students thought they could not give help because it was too difficult for them to understand specific subject topics.

In addition, for those control groups, most students also believed that they could do better on their English performance if they could gain assistance from English program students. However, fewer students thought that they could learn relevant English through constantly checking the information and having group discussion by themselves.

Overall, the statement quoted from one English major student, “through this collaboration, we can learn the contents of their disciplinary subjects, and I will know what level my English competency is and how far I can help them. In addition, we can make some new friends.” I may conclude that the interdisciplinary collaboration help students pay more concerns on their English performance for specific purposes. It also provides the opportunity for English and non-English program students to communicate with each other.

**CONCLUSIONS**

It was the first time for both program students to experience this kind of collaboration since they entered the college. Students faced great challenge to conduct the group projects related to specific disciplinary fields. No matter how hard it was, it can be concluded as, “it is too hard to learn this lesson, but I must do my best on it” quoted from a student’s feedback. All students accomplished their tasks successfully; in addition, many of them indicated that they had learnt a lot.

**Implications**

In the process of conducting the group projects, some topics conducted by specific groups were too difficult for English program students to comprehend. Thus, it declined students’ interest in exploring specific knowledge. In this, some subject topics were not suitable to be done through the interdisciplinary cooperation, such as the topics related to computer science and finance. However, those students who joined the groups about the popular issues in society, such as green marketing and educational training, could complete understandable and readable essays. It points out that the topic nature is one of the decisive factors to determine the level of achievement on disciplinary knowledge pursuing and writing skill development while conducting the interdisciplinary collaboration.

Not only were English program students lack of specific disciplinary knowledge, the teacher/researcher also had the similar problem. Then, was she qualified to offer ESP courses? Or, if it is appropriate for her to instruct non-program students’ specific disciplinary knowledge in English? In other words, what are the roles of English teachers in the ESP class? All groups in this study reflected that they gained deeper comprehension on their topics than before under the autonomous learning fashion. Meanwhile, the teacher/researcher could gain specific knowledge which she might not have opportunities to get involved before and after by means of face-to-face conference and final oral presentation supplemented by reading the texts composed by English program students.

It is quite correspondence with the Chinese saying that “teaching and learning promote and enhance each other.” Following the teacher’s guidance, students conduct the specific projects in person. Both the teacher and students gained knowledge through the process of learning by doing it. Furthermore, although students gained a lot of knowledge and experiences that they did not have before, they also had a lot of complaints about the heavy workload while comparing with their peers taking the same courses offered by other teachers. It seems that many students did not appreciate their teachers to provide this unique opportunity for them to reinforce their competency. Thus, while designating heavy work for students to conduct, the teacher/researcher takes the risk of obtaining an unsatisfactory evaluation given by the students at the end of the semester.
Based on most students’ positive reflections on English and specific knowledge learning, however, it is important for English teachers to take the interdisciplinary project-based learning technique in their classes. While conducting interdisciplinary group projects, all groups encountered similar problems. The participants who joined in this project were all sophomore students and had heavy course work to deal with.

In addition, many of them had part-time jobs after school. Therefore, it became problematic for group members to find a mutual available time to have discussions. In order to get rid of this problem, they would adopt the technological devices, such as sending text messages through cell phones, taking MSN messengers, and sending e-mail messages to carry out their project. Although, they completed their task finally, many of them felt annoyed with the time consuming work.

In addition, many English program students indicated that they had no background knowledge about the project collaborated with their counterpart groups; thus, they did not know how to help their counterparts. They were not sure if their translation was correct or not. At this point, many non-English program students also indicated that they were suffering from the translation task.

However, in order to achieve their projects in time and successfully, they kept asking their teachers questions and searching for the answers on the Internet. Thus, although, English was the most challenging task students encountered, through reinforcing the problem solving skills, most students from English and non-English programs indicated that they not only had learned specific disciplinary knowledge they did not know or were not familiar with before; they also improved their English on specific purposes.

Limitations of the study

While conducting this study, certain problems surfaced. They included the small sampling numbers and many different disciplinary subjects were also involved.

Two different sources, English and non-English majors, joined in this study and there were only 68 students in total. Thus, the findings revealed in this study may not be generalized directly to other disciplinary areas. However, the success of this study can inspire English teachers on how to conduct their ESP classes. As noted previously, it was the first time for students to conduct the ESP project. Not only does it challenge students’ problem solving skills and disciplinary knowledge development, it also gives English teachers an opportunity to examine appropriate approaches used in ESP programs.

There were six different disciplinary areas engaged in the non-English programs. As such, it was hard for the teacher/researcher to take all of the different problems and opinions proposed by the students. In addition, because too many different topics were presented in the class, it was hard for students with specific disciplinary backgrounds to cross the line to explore other irrelevant fields. They usually focused on those proposed by their peers from the same programs. Thus, each disciplinary group could only gain limited professional knowledge as it related to their field in this study.

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