PROBLEM-BASED LEARNING: A SOURCE OF LEARNING OPPORTUNITIES IN UNDERGRADUATE ENGLISH FOR SPECIFIC PURPOSES

Elizabeth, M. A., Zulida, A. K.
Faculty of Science, Technology & Human Development, Universiti Tun Hussein Onn Malaysia, 45600 Parit Raja, Batu Pahat, Johor, Malaysia
Tel: +607-4537939 E-mail: eliz@uthm.edu.my

Abstract

This paper reports on an investigation into Problem-Based Learning (PBL) on a first year undergraduate English for Specific Purposes (ESP) course in a Malaysian university. PBL described as small group collaborative learning is a pedagogical approach that assumes the centrality of real-world problems to learning. It is purported to empower learners by encouraging them to take a centre stage in learning and become independent self-directed learners. In this study, PBL was implemented in an ESP classroom consisting students from the Faculty of Technical and Vocational Education to enhance real world language skills. The research was a longitudinal, qualitative ethnography study of the implementation of PBL in one class over one semester. In particular, this paper focuses on student experiences of learning in a PBL environment. Data on the student experiences were gathered from classroom observation, interviews with students as well as lecturers and student reflective journals. Initial analysis reveals that students welcomed the PBL approach and the opportunity to take more responsibility for their learning. However, they did find PBL to be challenging, particularly in the initial phase when they were confronted with learning in a different mode. Further analysis discloses that students developed a new awareness of their learning through exposure to hands-on learning and ongoing reflection on their learning in the course. The paper further argues that the students’ experiences and positive attitude towards learning English confirms that PBL, though challenging, can indeed be a useful teaching strategy in the Malaysian or similar contexts.

Keywords: Problem-Based Learning, English for Specific Purposes, collaboration, group work, language learning, language development

1. INTRODUCTION

At present, we are progressing into the era of rapid developments on the knowledge economy and of instant changes on the technological information too. Thus, in order to meet the coming of the knowledge society and face such new challenges (Chao & Shao, 2005); traditional teaching and learning methods (lecture-based direct instruction) too, need to gear towards cultivating students’ diverse abilities. Positive classroom climate have been
recognized to be very beneficial for language learning. As such, a more innovative teaching and learning approach is desired in this circumstance. Of all innovative instructional approaches, problem-based learning (PBL) is one of the most exciting and powerful teaching/learning method that have appeared in the last 40 years and has perhaps attracted the most attention from educators in professional fields such as medicine, nursing, engineering and education.

In general, PBL is a method of instruction that uses triggers as a context for students to acquire problem solving skills and basic knowledge (Zhang, 2002). In contrast to traditional instruction, conducted in lecture format, PBL normally occurs within small discussion groups of students facilitated by a facilitator who seeks to withdraw her support and expertise gradually, while encouraging students to accept more responsibility as a key part of their learning experiences (Barrows, 1988; Barrows & Tamblyn, 1980; Hmelo-Silver & Barrows, 2006). Nonetheless, it is not about factual information, as PBL encourages active learning and self-directed learning, where students take responsibility for their own learning, as they identify what they already know about the problem, and then ascertains what they need to find out, what questions are relevant to their inquiry and what actions they need to take.

McMaster University adopted PBL for medical education in the 1960s, the first school to do so. As PBL gained recognition and credibility in medical education, allied health fields namely dental education (Branda,1990); environmental health (Gist,1992); nursing education (Glen,1995) and occupational therapy (Royeen,1995) have begun to use PBL in their educational programs as an entire curriculum or as an instructional strategy within a conventional curriculum too. In education, Bridges and Hallinger (1995) have applied a modified PBL approach to the preparation of school administrators, whereas, Casey and Howson (1993) have investigated the use of PBL approach in the education of preservice teachers.

A central, organizing premise of PBL is linking theoretical knowledge to practical application through the use of collaborative groups in which students are responsible for deciding what is to be learned. Collaborative learning is the basis of Vygotskian concepts that define learning as the social construction of knowledge. Acquiring new knowledge and restructuring existing knowledge emerge as individuals with differing viewpoints, experiences, and levels of knowledge about a topic engage in investigating, resolving, and ultimately creating a new, shared understanding of the topic through interaction with one another. A fundamental rationale for instructional approaches that promote cooperation between learners is that such approaches more closely approximate the ‘real world’ than traditional didactic strategies. That is, activities requiring cooperation among individuals reflect how tasks are usually accomplished in practice (Vygotsky, 1978) and as such language plays a key role.

The purpose of this paper which cuts across two different boundaries; Problem Based Learning (PBL) and Language Learning, thus, is to discuss insights gained about the use of PBL in English for Specific Purposes (ESP) language learning setting. Teaching and learning of all English language courses including ESP at University Tun Hussein Onn Malaysia (UTHM) have been didactic in nature: lecturers deliver formal lectures to transmit knowledge; students receive it passively and then reproduce accurately in examinations. This lecturer-centred teaching/learning approach may be easy for lecturers, but it does not provide an active learning environment, (Zhang, 2002) for the students, therefore, sometimes the learning outcomes and feedback from the students are not satisfactory. Furthermore, students’ skills valued by employers such as cooperation,
communication, problem defining and solving are often not emphasized in the traditional methods of teaching English.

Much research and evaluation have been conducted on PBL as a curricular and instructional innovation. For the most part, the research has investigated outcomes (e.g., comparisons of achievement outcome measures of students in PBL versus conventional curricula), the organizational and administrative tasks involved in implementing an innovative curriculum, and students’ information-gathering and study patterns. However, little research has been conducted on the underlying learning processes of PBL, specifically on language learning students’ perspectives of the process in relation to their learning, in collaborative groups.

2. METHODOLOGY

This paper drawn from a larger study with a primarily interpretive approach; referred to as qualitative studies take a semiotic approach; that is, one that focuses on the co-construction of meaning within a particular social setting (Davies, 1995; Hammersley, 1994; Holliday, 2002; Mason, 2002). Thus, qualitative ethnographic case study approach was used to obtain detailed pictures of the PBL phenomenon and language learning as the study aimed to investigate the process of PBL, as to how students learn and how they construct knowledge together. The major concern of the study was to identify factors in PBL classroom interaction that enabled (or constrained) English language use and development.

3. PARTICIPANTS

The participants of the study comprised students and lecturers from UTHM. The students were a class of 25 second semester undergraduates from the Faculty of Technical and Vocational Education enrolled in an ESP course; UMB 1052 Effective Communication who was involved in a PBL environment in its natural settings, whereas, the lecturers comprised a course lecturer and six other ESP lecturers.

4. DATA COLLECTION AND ANALYSIS

Since an essential procedure in ensuring rich description, as well as research credibility in qualitative research is to triangulate data, multiple sources and techniques of data collection methods were used. As the author brings into the study an ontological perspective which sees interactions, actions, and behaviours as central, classroom observation which is an established method for data collection in case study research (Miles & Huberman, 1994; Stake, 1995; Yin, 2003) was used. Twelve of the fourteen weeks of lessons were observed and video recorded, and this provided an emic perspective to excavate knowledge and data. Besides that, unstructured interviews with open-ended questions (Clough & Nutbrown, 2002; Holiday, 2002) conducted with the students, course lecturer and other ESP lecturers as another option of data collection allowed freedom of expressions and spontaneous reflections from them. All eleven interviews were audio recorded with permission. In addition, field notes, reflective journal entry data gathered from learners and author’s reflective diary were used to provide additional depth and verification for the data gathered from the classroom observations and interviews with the participants (learners & lecturers).

The videos were examined and summarised via a video mapping spree. Identified episodes of the classroom interaction and all interviews were transcribed in full and verbatim using the Transana program for video analysis (Fassnacht & Woods, 2006). In doing so, anonymity was upheld to comply with both data protection regulations and participants’ identity on ethical grounds. The study further took the form of description, analysis and
interpretation in terms of the organization and presentation of the data, in order to produce a layered account. Nevertheless, analysis is a particularly problematic area for research within naturalistic/ethnographic framework (Hammersley, 1995) as methods of analysis are not transparent as the quantitative data (Punch, 1998). Though the data are presented as objectively as possible, the findings of the investigation, like those of most qualitative studies, are open to multiple interpretations (Wolcott, 1994). Furthermore, the resulting conclusions are clearly limited to this particular ‘sending context’ (Lincoln & Guba, 1985); in turn, the reader is invited to evaluate their ‘transferability’ to his/her own ‘receiving context’.

5. DISCUSSIONS

The initial findings illustrated that the PBL approach cum environment offered both linguistic and affective benefits in the ESP class (Anthony, 2008a; 2008b). It stimulated communication and generated substantial discussion on a variety of natural learning issues, resulting in constant use of English for academic and social interaction. In reference to that thus, this paper presents the key issue of the study; what and how ESP students learn via PBL beginning with the learning process, self-directed independent learning and then gradually making a link between the key features of PBL and key elements of language learning.

5.1 The Learning Process

The PBL learning cycle begins with the presentation of a problem and ends with student reflection. From the beginning, students question the facilitator to obtain additional problem information and they also gather facts by doing research (Torp and Sage, 2002). In this study, students performed searches to determine what encompasses a community project. At several points during their problem solving, students typically paused to reflect on the information they have collected so far, generated questions about that info, and assumed underlying means that might help explain the information further. The students also identified concepts they need to learn more about in order to solve the problem known as the learning issues. From time to time, they for instance kept checking on things like budget, poster, letter and brochure constantly to ensure everything was in balance and running smoothly for the success of the project as a culmination of the given trigger.

The students then set out independently to research the learning issues they have chosen after cracking the problem with their existing knowledge. They then got together again after a couple of days to share what they have learnt, reconsidered they assumptions and/or generated new assumptions in light of their new learning. As proven from the study data, when completing the task, the students deliberately reflected on the problem to abstract the lessons learned about the problem, their self-directed learning and collaborative problem-solving process.

While working through the problems, it was evident that students use whiteboards/flipcharts to record their budding ideas. Figure 1 shows an example of how the ESP students used the whiteboard/flipchart while determining the causes related to the safety of Proton Car. The whiteboard, divided into four columns, as one can see, known as the FILA TABLE facilitated problem solving. The Facts column contained information that the students gathered from the trigger such as what the problem was, who was involved and where it occurred. The Ideas column kept track of their developing assumptions about solutions, such as “do not have quality materials; increase inspection before car is launched; drivers’ bad attitude and lack of driving lessons”. Then the students place their questions for further study into the
Learning issue column. In this example, students identified issues related to the safety of Proton Cars and causes of road accidents: “how to increase the inspection; did drivers get enough experience to drive on the real road; and how bad is the drivers’ attitude?” Finally, they used the Action plan column to keep track of plans for resolving the problem or obtaining additional information such as calling a government agency. These four columns or rather the FILA TABLE provided scaffolding communicating the problem-solving process in PBL (Hmelo & Guzdial, 1996). Simultaneously it was recorded on a word document as evident of the progressive learning process for future reference and discussion.

Figure 1: The Use of White Board during the Trigger Analysis

What we see here is that, in the process of analyzing the trigger, the FILA TABLE and whiteboard served as a focus for negotiation of the problem and as a forum for students to co-construct knowledge. The whiteboard helped students to externalize their problem solving and allowed them to focus on more difficult aspects of the problem-solving process. It further provided a model of a systematic approach to problem solving. In addition, supported student planning and monitoring as they identified what needed to be recorded on or later removed from the board.

Besides that, the analyzing process helped support knowledge constructions as students were guided through their learning and problem-solving process. As students began to discuss a problem with a raw understanding, they in fact, activated their prior knowledge, which helped prepare them for learning (Schmidt et.al., 1989). It also facilitated the social construction of knowledge as students worked in small group using their inquiry skills to solve given real-world problems. For example, these ESP students learnt in the context of authentic work related communication problems, using the inquiry and discourse skills of communication. As students generated assumptions and defended them to others in their group, they publicly articulated their current state of understanding, enhanced knowledge construction and set the
stage for future learning (Anthony, 2009). In doing so, it was found that students became engaged in the learning process based on their initial understanding and maximized the ample opportunity created to use the English language, unlike in the lecture-based lessons.

Triggers used in the course inspired and allowed students to visit key concepts in a number of problems across the entire course (Hmelo-Silver, 2000) and thus this strengthen the understanding and mastery of the concepts which tend to be the fundamental gist of the curriculum. For example, each student in this study was obliged to explaining and justifying her solution/assumption to the other members and to listen to as opposed to hearing the others reason. Thus, they had opportunities to clarify or revise their own understanding, both when they gave justifications and also when they listened to the other members clarifications, and attempted to develop a structure in which both their own constructions and the others rationalizations made sense. Thus, it was likely that these raised their confidence level besides strengthening knowledge and understanding in future tasks, which involved the concepts, either in theory or practice. The students became more confident as time went by as by then, they knew what meeting was all about, how to prepare for, engage in and chair one. In addition, write the minutes, agenda, etc.

Another notable observation that leads to an assumption is that the small group structure in this student-centred approach helped distribute the cognitive load among members of the group. Taking advantage of group members’ distributed expertise and level of language proficiency in this mixed ability context, allowed the entire group to tackle the trigger/problem. On the contrary, under normal circumstances, it would be too difficult and challenging for each student to handle alone the problem as homework at the end of a lesson, in a teacher-centred class. The notion of distributed expertise in this PBL course is relevant because as the students divided the learning issues, and engaged in self-directed independent learning, discussed in detail, in the following section, they became ‘experts’ in the particular topics assigned or responsible for as they searched and sourced them particularly well. They felt proud and to certain extend, honoured too to be in that position; provider of knowledge and not the receiver, as of in a regular teacher-centred class.

Furthermore, research too suggests that the small group discussions and debate in PBL sessions enhances problem solving and higher order thinking and promotes shared knowledge construction (Blumenfield et.al., 1996; Brown, 1995; Vye et. al., 1997). On the whole, the PBL learning process which revolves around small-group problem solving, gives rise to opportunities for learning that do not typically occur in the traditional lecturer-centred classrooms. It further incorporates both independent learning as well as team working as its key supporting features.

5.2 Self-directed Independent Learning

The development of independent self-directed learning skills is seen as a major goal of PBL (Barrows, 1986). It was evident that learner independence was fostered during the study. Prior to the Effective Communication session, student participants in the study context were not accustomed to working independently in class just as argued by Liu (1998) that students from certain culture are passive learners and require a strong teacher-authority figure, who is the transmitter of knowledge. Ho, et al. 2001, echo in part this concern when they state that Asian students lack passion for what they study, they expect the teachers to tell them exactly what to read and assign clearly defined tasks. In short, it articulates that in such culture, students are not encouraged to be self-directed learners. This was especially true in this study, in Dr. Ben’s initial classes. The students were not doing anything
individual, everything was lecturer directed.

There is some interaction (not voluntary though). Dr. Ben had to point to a particular student ... there seem to be more facilitator talk than student talks despite the fact that there was interaction – very bare minimum. (Field Notes, January 7).

Part of the student dependence upon the lecturer could be related to their academic experience in schools and partly due to their experience in their other classes here in UTHM, where lessons are still pretty much lecturer-centred with students be inclined to sit back and wait to be ‘spoon-fed’ literally. All, if not most of these students have progressed through a traditional education system where knowledge is taught through lectures. However, what emerged after the first couple of weeks after PBL approach in place was that high level of independence and self-direction on the part of the participating students. The lack of student self-sufficiency changed, and these students began to show progressive or rather drastic changes for some in terms of their attitude towards learning generally and language learning in particular. Students became more independent in the computer lab as well as in the classroom. By the end of the third week, students were turning on computers and working on their own even before the lecturer arrived to class. At the end of week six, notions of lecturer authority were challenged and students explored new roles on their own. One outstanding example was the ‘community project passion’ sometime into the ninth week as recorded by the author:

On 3 March, Dr. Ben was a little late due to a prior official management engagement. He was almost fifteen minutes late for class. The students started up the computers, desk tops and some lap
tops and began working loudly in respective groups. They got onto Google and started searching for all sorts of info. Helping each other along, they worked on their community project assignment. Some were even using the opportunity engaging in and finishing previous blackboard discussions. The students did not seem bothered with my presence there, and they were still going on and on when Dr. Ben arrived. They did not care to stop but ignored his entry. There were none of the usual greetings. Dr. Ben and I stood in the back of the class for a moment watching with amazement. It seemed that they had dropped all notions of lecturer as a figure of authority. The students continued and kept going until Dr. Ben called several times for them to pause and listen to what he has got to say... (Field Notes, March 3)

The new independent roles students were exploring were only partly due to the facility and familiarity they had gained on computers and laboratory. They were also becoming more independent in the classroom. Teamwork organization, the FILA TABLE and the project being underway seem to have played a role in the new independence. Dr. Ben had been facilitating student problem-solving and group members were helping one another. In addition, the students were familiar with their project goals now and they were able to pick up on lessons from previous classes and had become accustomed to the PBL class routine. There is no doubt at all that through the PBL approach employed in the ESP classroom under study, students have ended engaged in independent self-directed learning. In the course of this study, it was evident that the students had analyzed the problems, find solutions, organized visits and
arranged appointments and conducted interviews involving personal staff at a different level of social status, using appropriate communication protocols to obtain information in order to solve given trigger, leading to completion of mission or rather assignment undertaken. It is also apparent that the students managed their own learning which included planning, monitoring, problem-solving and finding solutions to the problem. In so doing, they had learnt from shared knowledge and accumulated expertise by their own study and research just as real practitioners do.

6. CONCLUSION

Class transcripts and learner reflective journals also indicate that students frequently used their group as a tool for English learning as they taught and asked questions to each other. They helped each other pronounce, spell and write English words. In the process of analyzing given trigger, they discussed rather vaguely English vocabulary, grammar and how to look up words in the dictionary. The success of student groups in enabling learning and increasing learner confidence combined with overwhelmingly positive attitudes students had towards PBL group work all suggest that students developed effective team working skills in PBL after all. They learned to work together, to organize them and tend to have developed the strategy of using team roles. They successfully found ways of working together despite having to adapt to the differed and challenging teaching and learning approach.

The ESP students learn English and content knowledge via the process of problem-solving, which is consolidated by team-working and independent self-directed learning to a certain extent. This was what feared lacking in the lecturer-centred classes where students particularly in this study context waited to be pushed around previously. Subsequently, this effective engagement of the students has fostered the learning of language through use manifested via the active engagement and use of language in the PBL classroom.

Dr. Elizabeth, M. A senior lecturer and the head of languages and communication at the Faculty of Science, Technology and Human Development, University Tun Hussein Onn Malaysia (UTHM) teaches undergraduate English for Specific Purposes (ESP) and postgraduate English for Academic Purposes (EAP) courses. She has worked as a primary school teacher and teacher educator prior to this. Her research interests include second language acquisition and use, classroom interaction, student-centred learning, independent learning and learner autonomy, Problem-Based Learning (PBL) and ESL pedagogy in L2 development. [eliz@uthm.edu.my]

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