THE EFFECT OF PROBLEM-BASED LEARNING ON UNDERSTANDINGRESEARCH IN SECOND LANGUAGE AMONG ENGLISH LANGUAGE TEACHING M.A. STUDENTS

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ABSTRACT

This mixed-mode research investigated the effect of problem-based learning on understanding research among English language teaching students at M.A. level at Tabriz Payame Noor University in Iran. 36 M.A. students took part in the study. 18 students went through a traditional lecture-based course as the control group, and 18 students went througha problem-based learning coursein a different class as the experimental group. After carrying out the experiment, a questionnaire designed by the researcher was given to the students to find out how they felt about the new approach.

The analysis of data after 5 weeks of treatment proved that problem-based learning can be considered as a more effective approach to enhance students' understanding ofresearch in terms of identifying variables of the study, formulating research questions, and designing the study. Also, the results gained from the questionnaire showed that the students had a very positive attitude toward problem-based approach, since they found the method less stressful, more cooperative and more effective.

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Introduction

There would undoubtedly be no scholar in any discipline to admit that understanding research is unnecessary for scaffolding science. That is why, a considerable amount of effort is made to prepare good researchers in higher educational systems, especially post graduate students, regardless of the disciplines in which they study.

English language teaching (ELT), as a discipline which has undergone drastic changes in the second half of the 20th century, owes a lot to research and researchers, as before the advent of research and valid statistical measures to define classroom outcomes and learners behavior, the discipline was merely an idiosyncratic and anecdotal one (Brown, 2007, p. vii). Thus, it is very important to train versatile researchers to further develop ELT.

Although the issue of research is vital to the ongoing success of ELT, many ELT students are facing problems which hamper their success in research. First of all, as mentioned by Wallace (1991, p. 21), not all students have complete understanding of the materials covered in articles studied by them (depending on their processing types e.g. deep active, surface active, deep passive, surface passive). As for ELT students who study in a second language medium, the chances of understanding the articles are even less, whereas understanding plays a crucial role in research. Besides, research requires active students who do not look at the phenomena in an impartial way, but not all students are active, as students learning styles and strategies varies among individuals.Thus, it is very important to adopt an approach to teaching research to ELT students which can both enhance students understanding andget them involved in the research process actively.

The main concern of the researcher in this study is to find an appropriate approach to teach ELT students how to plan successful research projects. In order to do so, the researcher, examined problem-based approach as a possibility that could help enhance students' researchabilities; namely, identifying variables, formulating research questions, and designing research. There are several reasons for this choice. First of all,research, in its basic form, is trying to find answers to questions. In fact, the starting point of research is a problem. In problem-based approach, it is also stated that the starting point for learning should be a problem, a query, or a puzzle that the learner wishes to solve (Bound, 1985, p.13). Also, deep understanding of the

research variables and design is essential for researchers. Problem-based learning, as mentioned by Larsson (2001, p.2)argues that PBL accords with Blooms constructivist approach by aiming at enhancing learners' comprehension, questioning and critical thinking abilities. On the other hand, a very important issue with regard to research in second language is teamwork and communicative skills; researchers usually need to deal with great number of participants. The following quote by Woods et. al (1996) can tell how research in second language and problem-based learning converge in this regard:

> one of the most innovative developments in the education in the past 30 years. In PBL, the problem drives the learning. Instead of lecturing, we give the students a problem to solve. For that problem, small groups of students identify what they know already and what they need to know, set learning goals and make learning contracts with the group members (1-4). Each student learns the knowledge independently and then returns to the group to teach others that knowledge. The group uses that knowledge to solve the problem. The group reflects and elaborates on that knowledge. (p.60)

Another reason why problem-based learning can help enhance research ability in post graduate students of ELT is that students in PBL classrooms find learning more motivating, engaging and satisfying (Hmelo-Silver,2004). This can help post graduate students who find the research course a difficult one. Also PBL's success in teaching discrete skills such as problem finding (Gallagher, Stepien, &Rosenthal, 1992), rules of argumentation (Belland, Glazewski, & Richardson, 2008),experimental method (Feng, VanTassel-Baska, Quek, Bai, & O'Neill, 2005), collaboration and peer tutoring and metacognition (Shamir, Zion, & Spector-Levi, 2008) shows that PBL has already been successful in delivering educations in areas which are very close to research or are parts of it.

Key words

Problem based learning (PBL), English language teaching (ELT), research variables, research questions, research design

Statement of the Problem

Writing thesis is a daunting task for many ELT students at M.A. level in Iran. Most of the students have not published any papers before, and have no experience of designing research. Although there English is mostly good, they find it difficult to distinguish between different types of variables and to formulate research questions.

Besides, since the educational system in Iran deals with a great number of students at the same time, the students have to take courses which are purely lecture-based and it leaves very little time to solve individual students' problems regarding their thesis.

Significance of the Study

If it proves that PBL is a more effective approach in teaching research to M.A students of ELT, the educational system can apply this mode of teaching to the curricula. Besides, it can help reduce the time and energy spent in the class and provide a better base for further research by the students.

Applying PBL to research classes can enhance the spirit of team work among the students which is an inseparable part of any successful research.In addition, the stress and pressure on students will be reduced.

Research Questions

Q1: Does applying problem-based approach to researchclasses enhance English language teaching M.A. students understanding of research variables?

Q2: Does applying problem-based approach to researchclasses enhance English language teaching M.A. students ability to formulate research questions?

Q3: Does applying problem-based approach to research classes enhance English language teaching M.A. students ability to design research?

Q4: what is the attitude of Iranian M.A. students studying English language teaching towards problem-based learning approach?

Research Hypothesis

The study is based on the following null hypotheses:

H01: Applying problem-based approach to research classesdoes not enhance English language teaching M.A. students'understanding of research variables.

H02: Applying problem-based approach to research classes does not enhance English language teaching M.A. students'ability to formulate research questions.

H03: Applying problem-based approach to research classes does not enhance English language teaching M.A. students' ability to design research.

H4: Iranian M.A. students studying English language teaching have a positive attitude towards problem-based learning approach.

Review of the Literature

PBL started as a reform in education in Canada in 1970's. Although it was used basically within medicine and business, it soon gained popularity in other academic disciplines such as biology and physics and to a lesser degree in history and geography (J. Larsson et.al 2001). The underlying assumption of PBL as stated by John Evans was "to stay away from the standard building-block structure, where a lot of content is shoved down the throats of the students, which they do not retain anyway and adopt a system where students are actively involved in the learning process." (Robert &kwan, 1997, p. 149)

Since 1970 up to now PBL has been vastly used in different parts of the world quite far from Canada such as Australia, Bahrain, Brazil, Switzerland, and Nigeria. Parallel to the application of PBL, investigations have been carried out to find out how successful this approach has been. One of the most recent ones, for example, was carried out by Virginie F.C. Servant and Eleanor F.A Dewar (2015) to investigate PBL tutorship in medical and engineering programs in Malaysia claiming Malaysia to be the first county in Asia to take PBL and PBL to have worked quite successfully there.

Major Trends in PBL

There are two major trends in PBL trend. The first and probably the most important one is whether the learners in a PBL setting learn as much as learners in traditional instruction settings. According to (Davis, Oh, Anderson, Gruppen, &Nairn, 1994; Gallagher &Stepien, 1996; Goodnough& Cashion, 2003) Current research has demonstrated that children and young adult learners in PBL classrooms can learn at least as much as other students if the problems in case there have been careful construction of the lesson around content.

The second inquiry is whether the learners can learn discrete learning skills through PBL curriculum. Findings support PBL as a method of teaching many different kinds of skills including problem finding (Gallagher, Stepien, &Rosenthal, 1992), rules of argumentation (Belland, Glazewski, & Richardson, 2008), experimental method (Feng, VanTassel-Baska, Quek, Bai, & O'Neill, 2005), collaboration and peer tutoring and metacognition (Shamir, Zion, & Spector-Levi, 2008). The strongest and most consistent finding in this branch of research is that students in PBL classrooms find learning more motivating, engaging, and satisfying (Hmelo-Silver, 2004)

Learners' experience in PBL leads to achievement as evidenced in structural equation models where student engagement contributes both directly and indirectly to achievement (Schmidt &Moust, 1995). At least part of this achievement seems to be the situational interest aroused by the problem itself. The problem engages the student, arouses interest, and the child learns as a result of being intrigued (Schmidt, Rotgans, & Yew, 2011).

Why PBL

Application of PBL to different principles is not without reason. In general, it has been proved that the learners enjoy being actively involved in a learning process (Antepohl&Herzig, 1999). It means that the learners have active participation which can in turn reduce the pressure of intensive traditional teaching methods and help with the workload of the educational system. On the other hand, studies carried out on the performance of the learners educated in PBL classes' shows that they have better long term retention of knowledge, although they may not perform as good as other learners who took a traditional class in some tests such as multiple choice tests (Norman & Schmidt, 1992).

PBL tries to create a real life situation in which the learners are involved in a meaningful learning process. Unfortunately, memorization is a common occurrence in traditional programs which offers no solutions to the learners' real life problems. In addition, it is the learners who formulate the problem and generate ideas to solve the problem. Thus, the learners will have increased self-direction in terms of resources (Vernon & Blake, 1993), and they become better information seekers than traditional learners. Also, when problem are engaged, higher levels of comprehension and skill development occur (Albanese & Mitchell, 1993).

Furthermore, social interaction which is an inseparable component of language learning and learning through the languageis fostered in collaborative group works carried out in PBL classes. Hence, the learners' interpersonal skills are improved (Bernstein et al., 1995; Vernon, 1995).

Larsson(2001) in the article " problem-based learning a possible approach to language education" argues that PBL accords with Blooms constructivist approach by aiming at enhancing learners' comprehension, questioning and critical thinking abilities, all of which are essential for language learning. He also mentions that language is a tool when learning not a subject of it. This fact reveals a difficulty in regard with PBL and language learning. Since for formulating a problem the learners need some raw facts which come through language. Now if language is to be formulated as a problem, the learners may lack raw facts to generate ideas and find solutions. Also, situating PBL into EFL or ESL settings is a very important issue. Abdullah and Hayati (1998) argue that "PBL can situate language learning by posing problems like those found in real life and which are relevant to the learners' situations." That is why, formulating problems in EFL and ESL setting are difficult. In fact, it requires a lot of artistry on the side of the instructor to guide the learners to obvious real situations.

J. Mathews-Aydinli (2000) argues administrators need to fulfill a supportive role as initiators of PBL or by assisting the instructors who aim at using PBL in language learning classrooms. In fact PBL can seem to be costly in the eyes of the administrators as in lecture-based teaching the instructor as the lecturer can deal with a great number of learners at the same time since interactions are low and as long as there are seats more learners can attend the class. But PBL requires group work which means high amount of interaction and that is why one

instructor cannot deal with many learners at the same time which means more instructors are going to be needed

Methodology

After diagnosing the problem M.A. ELT students had with regard to understanding research, the study was designed by the researcher to see if problem-based learning could enhance M.A. English language teaching students' ability to understand the variables, formulating research questions and designing research.

Participants

The participants for this study were randomly chosen among 40 M.A students who were taking the proposal writing course on the spring of 2015. Nelson homogeneity test was given to the students to make sure only advanced students with good English proficiency are chosen for the study. Nelson test consists of 50 items designed to homogenize English students based on the results. Except for 4 students, the rest scored 44 and above which shows the students were all at advanced level. 4 students' with their English proficiency below the advanced level took the course, but were not considered in data analysis. The table below shows the descriptive data of the participants:

Table 1: Participants descriptive data

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FEMALE	29	80.6	80.6	80.6
	MALE	7	19.4	19.4	100.0
	Total	36	100.0	100.0	

Among 36 participants who took part in this study, there are 7 male and 29 female participants. The participants were divided into two groups; namely, experimental group (N=18)

and the control group(N=18). The control group took 15 hours of class in the traditional lecture-based mode, whereas the experimental group took 15 hours of education, but with regard to PBL.

Instruments

As already mentioned, Nelson homogeneity test was used in orderto homogenize the participants.

A video projector was used in both experimental group class (PBL) and the control group class (traditional lecture-based class).

The book 'second language research' written by Mackey and Gass was introduced to the participants in both groups as a self-study course book.

A final test designed by course professor was given to the participants after the course of the study (appendix1).

A questionnaire designed by the researcher was given to the students to check their attitude towards problem-based learning approach. (appendix 2)

Procedure

36 participants who took part in the study were divided into 2 classes. Each class took 15 hours of research course in 5 sessions during 5 weeks. In the control group class, the professor of the course used a projector to explain the structure of research. He also showed examples of researchconducted by other students to the participants. As homework he asked the students to complete one or two parts of their proposal for each session and to bring it for the following session. There was no team work and peer correction involved.

The control class schedule is shown below:

Table 2: control group class schedule

session	teach	Homework	activity
1	Overall format/ title section	Find a topic for your M.A thesis	--
2	Introduction section Background/	Write the background for the next session	Topics checked, corrected or rejected
3	Key words/objectives, significance, problem statements	Write the problem statement, objectives of the study and significance of the study	Background of the study was checked
4	Review of the literature+ methodology section	Write review of literature and methodology for next session	the problem statement, objectives of the study and significance of the study checked
5	referencing	Write the references/ hand in proposals after two weeks	Write review of literature and methodology for next session checked

Before the beginning of the course in the experimental group, the professor asked the participant to follow the procedure presented by him to get the most out of the course. He explained that he wants them to diagnose the problem, analyze the problem, and evaluate their findings in group. He also asked the participants to: 1. Try to be as cooperative as possible 2. Generate ideas 3. Discuss ideas with group members 4. Ask the professor their questions after their own effort 5. Write on final answer on the paper as the team's answer. The participants then were divided into 6 groups with the professor being a member of each and every group.

The teacher each session, introduce brief history of a few problems that existed in imaginary classes. The participants were supposed to identify the problem,choose variables, write the research topic, formulate the research questions and design the study. The participants in the experimental group covered 22 research topics this way. They were also asked to write their own proposal session by session as their homework.

After the course of the study and according to the fact that the course had no achievement test at the end and only the students' proposals were evaluated by the professor, the course

professor designed a test similar to the situations the participants faced in the classroom.The test included 3 tasks. In each taskthe participants were asked to 1. Identify the research variables; namely, independent, dependent 2. Write the possible research questions 3. Operationalize the underlying construct by designing the study.

The papers were then collected and scored by two different raters. An inter rater reliabilitytest (Fleiss' Kappa) was used to gauge the reliability of the scores given by the raters. The result showed a high degree of reliability(Fleiss' Kappa= 0.9)

At the end of the treatment course, the questionnaire was given to the students and the results were analyzed.

Data Analysis

The mean score of the data accumulated through the test given to the participants was compared using t-test. It means that in case of identification of research variables, formulation of research questions and research designs, the mean score of the students' marks (out of 9 for identification of variables and formulation of research questions, and out of 3 for research design) were compared. The tables below are based on the test given to the participants and their responses. Table 3 refers to participants' identification of variables in the study. Table 4refers to participants' research question formulation and table 5 refers to the research designs.

Table 3: answer to research variable identification

	control_group_variables	experimental_group_variables
Mean	3.4444	7.0000
N	18	18
S.D	.51131	.48507

The table above shows the mean score of the participants in identifying the variables in the research topics. In general there were 9 variables to be identified in the test. The participants

should have been able to mention independent and dependent variables in the test. As can be seen in the table the mean score of the control group participants is 3.4 out of 9 and the mean score for experimental group participants is 7 out of 9. Thus, the participants in the experimental group showed a better performance in terms of identifying research variables.

Table 4: research questions formulation

	controlgroup_RQ	experimental_group_RQ
Mean	4.3889	8.0000
N	18	18
Std. Deviation	.50163	.48507

The participants were also supposed to formulate 9 research questions for the 3 questions mentioned in the test. As can be seen in the table, the control group participants' mean score is 4.3 out of 9, whereas the experimental groups mean score is 8 out of 9. Thus the experimental group participants did much better in identifying and formulating research questions.

Table 5: research design

	control_group_reseach_design	experimental_group_research_design
Mean	1.3333	2.2778
N	18	18
Std. Deviation	.48507	.46089

The participants were asked to design the research suitable for the given topics. As the mean scores show in the table above, the participants in the experimental group were more successful in designing the research studies (M=2.27 out of 3). The participants in the control group, however, were less successful (M= 1.33 out of 3).

Conclusion/Discussion

The findings of the study clearly show that applying PBL to proposal writing courses can be more beneficial than traditional lecture-based approach to teaching proposal writing. Not only does it help students understand research variables better, but also they can formulate research questions and design the studymore successfully.

Many studies ; namely, (Hmelo-Silver, 2004; Hung et al., 2007; Loyens, Kirschner, &Paas, 2012; Schmidt, Rotgans, & Yew, 2011; Schmidt, van der Molen, teWinkel, &Wijnen, 2009) have shown positive relationship between PBL and improvement of professional, social and problem solving effects. The findings of the current study not only accords with the aforementioned papers but also add that PBL can improve English language teaching studentsunderstanding of research.

In addition, the students' responses to the questionnaire prove that 90% of the students find problem-based learning a more suitable approach for teaching research. All of the students find it very cooperative. 90% of the students mentioned that the approach is less stressful, and almost all of the students agreed that the issues mentioned in the problem-based class were more related to real issues faced in research which inturn, proves the construct validity of the course.

Appendix 1: final test:

Read the descriptions and: 1. Identify the research variables 2. Formulate research questions and 3 design the study.

1. A class has low proficiency in reading comprehension. The teacher thinks scanning and skimming skills might help increase students reading proficiency. Also, the teacher wants to know which of the mentioned items are more effective.

2. A class has shown reacted differently in terms of focused and unfocused written corrective feedback. The teacher needs to know which mode of correction suits her class better.

3. The students in a class have shown signs of error while producing consonant clusters in words such as "bland, skirt, green" by adding vowels in the middle of the consonant clusters. The teacher doubts that it might be related to either 'native language transfer' or 'transfer of training effect'.

Appendix 2: questionnaire

	0%	25%	50%	75%	100%
1. Understanding research problem is easier through giving a problem scenario.					
2. The problem-based class is less stressful.					
3. The problem-based class is more interesting.					
4. Less distance between the professor and the students is felt in the problem-based class.					
5. Remembering what I learned in the problem-based class is easier.					
6. The problems posed in the problem-based class were real research issues.					
7. The problem-based class broadened my view on research.					
8. The problem-based class helped me understand					

research procedures.					
9. I found the group-work in the class helpful.					
10. I prefer problem-based classes for other subjects as well.					
11. I think the tutor should lecture alongside problem-based classes.					
12. The problem-based class helps build mutual trust and relationships in the class.					
13. I believe understand in the problem-based classes is easier then lecture-based classes.					
14. In general, I found problem-based classes more effective than lecture-based classes.					

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