



EAP Learners' Attitudes Toward Problem-Based Learning: A Fast-Track to Fourth Generation Universities

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Abstract

Problem-based Learning (PBL) is considered one of the instructional models of learning with many pedagogical advantages that can bridge the current traditional learning systems' gaps. It is a method of learning in which the students start with a problem rather than the input provided by the teacher. The current study set out to investigate the major underlying factors of PBL from the Iranian English for Academic Purposes (EAP) students' point of view. It also aimed at identifying their attitudes toward the different elements of PBL. The data were collected through a validated and piloted questionnaire based on Likert scale (Cronbach's Alpha of 0.73) from among 379 Iranian EAP university students (196 male and 183 female) from soft and hard science fields of studies. The results of Exploratory Factor Analysis (EFA) showed that the students considered four different factors, namely (1) Project-Based Learning, (2) Collaborative Learning, (3) Use of Technology in Learning, and (4) Autonomous Learning. Moreover, the results of descriptive statistics also indicated that the Iranian students had a generally positive attitude toward PBL and believed that it would assist them in the process of language learning. Our findings can hold important implications for EFL teachers and materials developers and remind them to consider the students' socio-cultural background and previous educational experiences and accordingly plan an apt curriculum based on the students' needs and preferences.

Keywords: PBL, EAP university students, attitude, questionnaire, Iran

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Introduction

With the turn of the third millennium, the higher education systems require profound metamorphosis to account for the society's needs. The outcomes of the first and second-generation universities are too insufficient to saturate the requirements of present-time societies. The third and fourth generation universities' missions lie beyond education and research and are mostly targeted toward promoting knowledge, entrepreneurship, and creation of value for the immediate society (Lukovics & Zuti, 2015). These universities have to develop human resources which are skillful, creative, self-directed, problem-solver, and entrepreneur. A review of the literature reveals the superiority and prominence of student-centered learning over the traditional educational procedures, as it will assist the students to be more responsible for their learning, collaborate with their classmates, be autonomous, and improve their critical thinking skills (Liu et al., 2020).

The current status of higher education in Iran also indicates a preference for student-centered learning in academia. This is mainly witnessed in EAP courses, where the learners' cooperation and involvement can greatly improve the learners' progress. This is of course in spite of the fact that a number of challenges from both learners' and teachers' perspectives are pinpointed in the literature on the status of EAP in Iran, namely lack of practice, students' low level of language proficiency, teacher-centered classes, students' negative attitudes toward English, language exposure, and availability of the material (Eslami, 2010; Eslami Rasekh & Simin, 2011; Farhady, Hazaveh, & Hedayati, 2010). These challenges are due to the fact that the dominant learning model in the universities in Iran is lecture-based which can give rise to sheer friction and resistance in the mechanism of developing trained people for the community that has been levelled up to match those expected from third and fourth generation universities. Addressing the aforesaid problems requires adopting an innovative educational system with a progressive pedagogical approach. PBL is one of the modern pedagogical models of learning with versatile competencies which can hopefully contribute effectively to the fulfilment of the universities' mission in Iran. Savery (2006) defines PBL, first introduced in 1960s, as "an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem" (p. 12). In PBL, the focus is on the active participation of the students in learning, their ability to solve problems and explain the reasons, as well as developing skills in analysis and doing research (Barrows, 2000; Hmelo-Silver, 2004). During the recent years, a growing number of researchers as well as educators have noticed PBL and its use in different disciplines. The main purpose of the current study is to explore the Iranian university EAP students' attitude toward PBL and examine its underlying factors.

The core concept of PBL is believed to have been rooted back to the time before the dawn of history (Wee & Kek, 2002) since they used to pursue the apprenticeship framework of learning and knowledge transmission from father/master to an apprentice. The modern scientific conceptualization of the term is related to Socrates's views in ancient Greek by defining it in his "dialogos" or

dialectical approach (Schmidt, 2012) and, more recently, in the 20th century, Dewey's (1938) model of experiential learning. The first higher education center that is believed to be the pioneer of PBL is McMaster university in Canada, which started a reform in its medical education programs since 1967 (Lee & Kwan, 2014; Servant-Miklos, Norman, & Schmidt, 2019). Other universities like Maastricht had also experienced reform using PBL.

PBL is considered one of the instructional models of learning in the new millennium with many pedagogical merits that can bridge the current traditional learning systems' gaps. PBL is a method of learning in which the students start with a problem rather than the input provided by the teacher. It is a learner-centered (Savery, 2006), self-directed (Barrows, 1996) method of learning in which students are involved in self-search activities and through collaboration with the peers in small groups (Springer, Stann, & Donovan, 1999) and the supervision of the teacher can solve the problem or investigate a raised case. Schmidt, Rotgans, and Yew (2019, p. 26) summarized six distinct characteristics of Problem Based Learning: (a) PBL starts with a problem, (b) the students are required to collaborate in some small groups, (c) the instructor provides supple guidance, (d) there are limited lectures from the instructors, (e) the educations and learning is student-centered, and (f) the students have enough time to self-study.

Although PBL has its genesis in medical education, a brief telescopic view of the literature in the last 30 years reveals that it is now widely used in different disciplines. Studies range from the fields of medical education (e.g., Abdelkarim, Schween, & Ford, 2018; Choi, Lindquist, & Song, 2014; Ungaretti, Thompson, Miller & Peterson, 2015), pure science (e.g., Klegeris & Hurren, 2011; Li & Tsai, 2018), mathematical competence (Juandi, 2021), and engineering (e.g., Arman, 2018; Orji & Ogbuanya, 2018), to language education (e.g., Aliyue, 2017; Bejarano Beltran, Perez, & Yucely, 2016; Coffin, 2013; Fonseca-Martínez, 2017; Shin & Azman, 2014). The topics under investigation are also varied. In the realm of education, excluding humanities and social sciences, such topics as comparing the PBL and the traditional lecture-based methods (Choi, Lindquist & Song, 2014; Orji & Ogbuanya, 2018; Wong & Day, 2009), the effect of PBL on problem-solving activities (e.g., Choi, Lindquist & Song, 2014; Klegeris & Hurren, 2011), the effect of PBL on critical thinking (e.g., Choi, Lindquist & Song, 2014), change on students' perception (e.g., Klegeris & Hurren, 2011), and students' and teachers' attitudes toward PBL (e.g., Abdelkarim, Schween, & Ford, 2018; Arman, 2018) have been the targets of investigation. It needs to be noted that majority of previous studies in the literature reported the positive impact of PBL among the students of different ability levels and grades (e.g., Guimarães & Lima, 2021; Hmelo-Silver, 2013; Liu et al., 2019; Liu et al., 2020; Merritt, Lee, Rillero, & Kinach, 2017; Nariman & Chrispeels, 2015)

Interestingly, humanities and social sciences were among the last disciplines which welcomed PBL pedagogy, and it was early 21st century when language education used the tenets (Ansarian & Lin, 2018). The literature on the English language learning mostly concerns the application of PBL in improving language skills / subskills (e.g., Abdullah & Tan, 2008; Aliyue, 2017; Fard & Vakili,

2018; Lin, 2017; Elizabeth & Zulida, 2012; Sy, Adnan, & Ardi, 2013, Othman & Shah, 2013; Shin & Azman, 2014), metacognition (e.g., Aliyue, 2017), learning anxiety (Hwang, Hsu, Lai, & Hsueh, 2017), social interaction (e.g., Bejarano Beltran, Perez, & Yucely, 2016), and learners' attitudes (e.g., Huang, 2012). In the past few years, few studies have dealt with the learning and teaching stakeholders' attitudes toward PBL. The distinguishing factor among the existing studies is that two out of them - Huang (2012) and Abdelkarim, Schween, & Ford (2018) - administered data collection instrument after the students' / faculty members' involvement in the PBL program to help restructure and renovate the existing programs while in the study by Arman (2018), the data were collected prior to the implementation of the PBL program to embed it into their educational framework. Huang (2012) administered a 16-item-interview related to students' perception, satisfaction, motivation, and learning achievements in PBL to 42 medical first-year university students' who experienced PBL in their English classes. The findings revealed mostly positive results in terms of students' four areas of research. Arman (2018), on the other hand, collected data using a 30-item survey collecting data on four areas of Using Computer and Internet in Education, Self-Directed Learning, Cooperative Learning Style, and Practical Skills in Electronics from a number of undergraduate electrical engineering students. The findings confirmed the positive attitude of the students toward the PBL program in the Analog Electronic course.

Moreover, in the study by Abdelkarim, Schween, and Ford (2018), 243 faculty members from six U.S. medical and dental schools answered a 10-item survey to compare their attitudes about PBL which resulted in a significant increase in the enthusiasm, engagement, and agreement with PBL program. Similarly, Dole, Bloom, and Doss (2017) also reported a boost in the students' motivation, autonomy, and involvement in the lesson. In another study, Ulger (2018) stated that due to the use of PBL, there was a significant increase in the creative thinking of seventeen undergraduate students from Turkey. In another study, Liu et al. (2020) explored the implementation of PBL in different schools in the U.S. and the data on attitudes toward PBL, the experienced challenges, and the used techniques were collected from twenty-five teachers through conducting a series of interviews. The results showed that overall, as a result of the increase in the learners' motivation and their rate of deep learning and critical thinking skills, the teachers favored PBL.

Although the benefits of PBL are acclaimed and acknowledged by numerous scholars in the literature, there is still a need for inspecting the students' attitudes, especially quantitative ones, toward the issue (Liu et al., 2020; Merritt, Lee, Rillero, & Kinach, 2017). This may of course be as a result of the experienced challenges in the implementation of PBL (Kim, Belland, & Axelrod, 2018). To the best of the researchers' knowledge, there is no published evidence for the development and implementation of the PBL program in universities in the context of Iran, let alone any empirical evidence regarding the psychological aspects of the PBL and attitude toward it. Therefore, in response to this niche in the literature this study is an attempt to examine the Iranian EAP students' attitudes toward the implementation of problem-based learning in the pedagogical framework of EAP students as a step forward to lay the foundation of a change in the educational

system in Iran's higher education institutions. Accordingly, the current study aims to answer the following research questions:

1. What factors are regarded by the Iranian EAP learners concerning the implementation of PBL?
2. What is the Iranian EAP learners' attitude toward PBL approach and its different mentioned factors?

Method

Participants

Two groups of participants took part in the current study. The first group were 40 Iranian university students who took part in the study's preliminary pilot phase on developing the questionnaire (22 male and 18 female). The second group of participants, as depicted in Table 1, were 379 university students (196 male participants and 183 female participants, with an average age of 23) studying EAP courses. This group took part in the main data collection phase of this study. They were from different fields of study (*hard science* like mechanical engineering, industrial engineering, civil engineering, accounting, and *soft science* like Persian literature, law, psychology, philosophy) and were selected through convenience sampling procedure. This group was requested to fill out the developed questionnaire on EFL Learners' attitudes toward problem-based learning (PBL) approach. Also, it needs to be noted that all of the participants were Iranian and native speakers of Persian.

Table 1

Demographic Information of the Main Participants of the Study

Variables	Categories	Frequency	Percentage
Major	Soft science	135	35.6%
	Hard science	244	64.4%
Grade	Freshman	293	77.30%
	Sophomore	49	12.92%
	Junior	29	7.65%
	Senior	8	2.11%
Gender	Male	196	51.7%
	Female	183	48.3%
Age	18-25	285	75.19%
	26-30	69	18.20%
	31-35	25	6.59%
Total		379	100%

Instrument

The main instrument used in this study is a researcher-developed 30-item-questionnaire. To generate the questionnaire items, the researchers studied an extensive review of the literature on PBL and came up with a relevant questionnaire (Arman, 2018), which was close to the purpose of this study. Some of the items were modified and localized to fit the EFL context and the related course in Iran. Consequently, the researchers translated the items into the participants' first language (Persian) to facilitate the process of data collection (Appendix A). Then, three experts in the field of Applied Linguistics and an expert in translation and 4 EFL teachers checked the questionnaire for clarity and intelligibility to ensure its content validity. Finally, it was piloted with 40 Iranian EFL university students to check the questionnaire's reliability. Accordingly, a Cornbrash's Alpha of 0.73 was reported, which is an acceptable rate (Pallant, 2010). The questionnaire included 30 items concerning the different aspects of PBL in general English courses at universities and was based on a five-point-Likert scale (ranging from "1 = strongly disagree" to "5 = strongly agree").

Data Collection and Analysis

The process of data collection and analysis in the current study was done in the following two phases:

Phase 1: Piloting (Small-Scale)

In the first phase of data collection, the developed PBL questionnaire was piloted. In order to do so, 40 university students, similar to the main participants of our study (22 male and 18 female participants, with an average age of 22), filled out the questionnaire. Their similarity was established based on their age level, field of study, degree, and gender. The questionnaires were all distributed in print form and were mostly gathered from the students at one of the universities in Tehran (Therefore care must be taken regarding the generalizability of the results) and in person. The collected data were later fed into SPSS, and the Cronbach's alpha was calculated to determine the reliability of the questionnaire.

Phase 2: Main Data Collection (Large-Scale)

In the second stage and in order to facilitate the process of data collection, the on-line version of the questionnaire was produced via Google Forms. Later, the questionnaire link was sent to the prospective participants through email, messaging on social networks (e.g., Telegram or WhatsApp), or in person. The data were collected both through the on-line and print form of the questionnaire, as in many cases the students were found in university classes. Also, the snowball sampling procedure was adopted, and the participants were kindly asked to share the questionnaire with their other classmates and friends. In this way, a total of 400 questionnaires were collected after nearly six months. However, we had to discard 21 questionnaires upon their large number of missing items. Consequently, 379 questionnaires went for the final analysis. In order to analyze the data, both descriptive and inferential statistics were utilized. To make sure of the construct

validity of the questionnaire as well as answering the first research question and discovering the factors of PBL in Iranian students' view, an Exploratory Factor Analysis (EFA) was run. Furthermore, to answer the second research question, descriptive statistics (frequencies and percentages) were reported.

Results

Findings: Research Question One

The first research question in this study was: *What factors are regarded by the Iranian EAP learners concerning the implementation of PBL?*

In order to answer this research question, exploratory factor analysis (EFA) was utilized to investigate the factor structure of students' attitude toward PBL questionnaire (30 items, in five-point Likert scale format), with the factor extraction method of principal axis factoring (PAF) and also *promax*, as a rotation method. The rationale behind using this factor extraction method, that is, PAF, was that it would yield a factor structure in which common variance was represented and unique variance, and error variance were removed (see Tabachnick & Fidell, 2013), with the ultimate goal being maximizing the extracted variance (i.e., representing the maximum amount of data in a questionnaire). Also, the *promax* rotation method was exploited given that moderate correlation coefficients were observed among the extracted factors in the factor correlation matrix.

The suitability of the data structure for EFA was checked before its administration. First, the normality assumption of the data was inspected by examining the item's skewness and kurtosis measures with all of them being between -2 and +2. Hence, according to Tabachnick and Fidell's (2013) recommendation, the data met the assumption of normality. Secondly, the Kaiser-Meyer-Olkin measure was utilized to test the sufficiency of sample size for EFA, and it was 0.87, far exceeding the recommended value of 0.6 (Field, 2009; Kaiser, 1970, 1974). Ultimately, Bartlett's test of Sphericity was $X^2(435) = 4218.23$, $p = .00$ (see Table 2), illustrating that the correlations' magnitudes between items were sufficiently large for using PAF accurately.

Table 2

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.870
Bartlett's Test of Sphericity	Approx. Chi-Square	4218.23
	Df	435
	Sig.	.00

Having conducted EFA along with PAF as its extraction method, we came up with a preliminary six-factor structure (see Table 3). It should also be said that *Kaiser Criterion* was our factor retention criterion alongside a parallel analysis (see

Plonsky & Gonulal, 2015). After inspecting the factor structure matrix more closely (see Table 4), we found that two factors were indicated by just two items. As has been recommended by Meyers, Gamst, and Guarino (2013), there is a need to have at least three items per factor for it not to be considered a weak factor, one which has a moderate influence on the factor structure (Briggs & MacCallum, 2003); consequently, those two factors (factors 5 and 6 with accompanying items of 3, 4, 6, 7, see Table 4) were removed from the analysis given that they were not sufficiently represented by the items, and hence this rendered a final four-factor solution explaining 41.35% of total common variance, with those four factors accounting for 23.03 %, 9.81%, 4.80%, and 3.71%, of that common variance, respectively.

Table 3

Total Variance Explained by the Four-Factor Solution

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	Variance	Cumulative %	Total	Variance	Cumulative %	Total
1	7.38	24.59	24.59	6.91	23.03	23.03	6.14
2	3.47	11.55	36.14	2.94	9.81	32.85	4.09
3	1.98	6.61	42.75	1.44	4.80	37.64	3.97
4	1.61	5.36	48.11	1.11	3.71	41.35	4.05
5	1.46	4.86	52.97	0.95	3.18	44.53	2.67
6	1.39	4.63	57.60	0.79	2.64	47.17	2.62

Based on these findings, the final “Attitude toward PBL Scale” included the following four components and their related items:

(1) Component 1: “Project-based Learning”, which accounted for 23.03% of the total variance. This factor includes 6 items (27, 25, 24, 26, 23, and 30; Cronbach’s Alpha of 0.89)

(2) Component 2: “Collaborative Learning”, which accounted for 9.81% of the total variance. This factor includes 7 items (9, 22, 13, 12, 11, 28, and 10; Cronbach’s Alpha of 0.83).

(3) Component 3: “Use of Technology in Learning”, which accounted for 4.80% of the total variance. This factor includes 5 items (21, 2, 1, 8, and 20; Cronbach’s Alpha of 0.73).

(4) Component 4: “Autonomous Learning”, which accounted for 3.71% of the total variance. This factor includes 6 items (14, 17, 16, 29, 19, and 15; Cronbach’s Alpha of 0.72).

It should be emphasized here that items 5 and 18 were removed from the factor structure because of their low coefficients (lower than the cutoff value of .47) and thus not fully represented by it (see Table 4 for more information on all six preliminary factors and their accompanying items).

Table 4

Structure Matrix of Factors and Items

	Factor					
	1	2	3	4	5	6
Item 27	.845					
Item 25	.823					
Item 24	.816					
Item 26	.801					
Item 23	.720					
Item 30	.605					
Item 9		.731				
Item 22		.703				
Item 13		.692				
Item 12		.665				
Item 11		.639				
Item 28		.544				
Item 10		.534				
Item 18						
Item 21			.634			
Item 2			.628			
item 1			.616			
Item 8			.576			
Item 20			.495			
Item 14				.704		
Item 17				.565		
Item 16				.548		
Item 29				.513		
Item 19				.479		
Item 15				.478		
Item 7					0.520	
Item 6					0.501	
Item 5						
Item 4						0.515
Item 3						0.678

Findings: Research Question Two

The second research question in this study was: *What is the Iranian EAP learners' attitude toward PBL approach and its different mentioned factors?*

In the following section and to answer the second research question, the descriptive statistics for the different items on the scale are presented in more details. As depicted in Table 5, six items were associated with the first factor (i.e., *Project-Based Learning*). It was observed that item 30 received the highest mean rating score ($M = 3.86$, $SD = 1.03$). Nearly 70% of the students agreed that projects would improve the learners' self-confidence to a great extent. With little difference, item 27 was placed in the second place in this factor with a mean rating score of 3.79 ($SD = .95$). Moreover, nearly half of the participants believed that project will improve their language self-assessment skills ($M = 3.66$, $SD = .98$), encourage their creativity ($M = 3.53$, $SD = 1.03$), and make them more responsible ($M = 3.44$, $SD = 1.08$).

Table 5

Descriptive Statistics of Factor 1, "Project-Based Learning" (N = 379)

Item	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	M	SD
30 English lesson projects in the class will help me improve my self-confidence.	3.4	7.1	19.5	39.8	30.1	3.86	1.03
27 Projects in the English class can assist me in mastering different language skills.	3.7	5.5	19.8	50.1	20.8	3.79	.95
26 Projects in the English class will encourage me to improve my English language self-assessment skills.	4.0	7.1	25.9	45.1	17.9	3.66	.98
25 Projects in the English class will encourage my creativity and help me enrich my practical skills.	4.5	9.5	32.7	35.6	17.7	3.53	1.03
24 English lesson projects will improve my sense of responsibility.	6.6	10.3	31.7	35.6	15.8	3.44	1.08
23 English projects will increase my interest in English language courses.	8.7	13.2	32.7	30.9	14.5	3.29	1.13

The least scored item in this section was item 23 ($M = 3.29$, $SD = 1.13$) on the questionnaire, which ascertained that projects would increase the learners' interest, agreed by less than half of the students. The descriptive statistics regarding

the six items related to the second factor, *Collaborative Learning*, are presented in Table 6. As can be seen, items 13 (M = 3.90, SD = .93) and 9 (M = 3.89, SD = 1.08) were the most highly scored one. It was found that nearly 70% of the participants agreed that they are in favor of group works and prefer language learning in cooperation with the other classmates.

Table 6

Descriptive Statistics of Factor 2, “Collaborative Learning” (N = 379)

Item	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	M	SD
13 When dealing with a problem in English learning, I like to cooperate with the other students.	2.1	7.4	13.7	51.7	25.1	3.90	.93
9 I prefer to learn English in a group with my classmates.	4.0	7.1	19.3	34.8	34.8	3.89	1.08
11 I am interested in doing group work to do a project with my friends.	5.8	10.3	18.7	40.1	25.1	3.68	1.12
12 It is a waste of time to study English with the other students in a group.	10.6	12.1	16.9	30.9	29.6	3.57	1.31
28 I like to work alone on my English lesson projects.	9.0	17.4	27.2	30.3	16.1	3.27	1.18
22 When learning English, I prefer individual studying to studying in a group.	17.4	20.1	19.8	26.9	15.8	3.04	1.34

By the same token, the results also indicated that the least scored items were items 28 (M = 3.27, SD = 1.18) and 22 (3.04, SD = 1.34), which stated that individual learning is prioritized over group learning. These items were agreed on by even less than half of the participants.

The third factor regarding the use of PBL was linked to the *Use of Technology in Learning*, which was comprised of five items. As displayed in Table 7, generally, the students were positively disposed toward the use of technology to learn English. Majority of the students (nearly 60%) agreed that the role of

computers in language learning could not be denied. Item 2, which denoted this belief, received the highest mean rating score in this section ($M = 3.59$, $SD = 1.07$). Interestingly, it was also observed that the Iranian EAP students advocated the reading on-line material and preferred it to the printed materials. In this regard, items 20 and 21 were agreed upon by 30% ($M = 3.40$, $SD = 1.14$) and 53% ($M = 3.33$, $SD = 1.14$) of the participants respectively. However, very few were interested in computerized simulation in language learning.

Table 7

Descriptive Statistics of Factor 3, "Use of Technology in Learning" (N = 379)

Item	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	M	SD
2 Computers should play more important roles in English language learning.	4.7	11.3	24.3	39.3	20.3	3.59	1.07
1 I am interested in using office applications (like MS-Word & Excel) and on-line courses based on educational platforms like Edmodo and Moodle in learning English.	8.7	11.6	33.2	30.3	16.1	3.48	1.04
20 I prefer to learn English using a computer instead of reading English language textbooks.	12.9	24.3	31.4	20.8	10.6	3.40	1.14
21 I enjoy reading on-line English texts in an English language lesson.	8.4	12.7	25.1	38.3	15.6	3.33	1.14
8 I am interested in computerized simulations in English lesson activities.	4.0	11.1	36.4	29.6	19.0	2.92	1.17

Concerning the last factor, *Autonomous Learning*, the detailed results are portrayed in Table 8. A close look at the table shows that generally, the students did not consider themselves autonomous, and this was evident in their views. Although they believed that they might be able to use some software to learn English (Item 29, $M = 3.37$, $SD = 1.08$; & Item 19, $M = 2.91$, $SD = 1.33$) or choose the right type of source material in the process of English learning (Item 16, $M = 3.19$, $SD = 1.18$), they stated that it would be better to learn English with the help of a teacher (Item 17, $M = 3.23$, $SD = 1.02$).

Table 8

Descriptive Statistics of Factor 4, "Autonomous Learning" (N = 379)

	Item	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	M	SD
29	I can easily use different software to do my English lesson project.	9.8	19.3	29.6	30.6	10.8	3.37	1.08
17	I can never learn English without the help of a teacher and on my own.	18.2	24.5	20.1	23.0	14.2	3.23	1.20
16	I can locate different suitable sources for learning the English lesson.	5.3	16.1	29.8	33.8	15.0	3.19	1.18
15	I cannot choose my favorite topic in English language lessons.	8.4	18.7	36.7	17.7	18.5	3.13	1.07
14	I can learn new topics in the English language lessons on my own.	8.4	21.9	23.2	30.6	15.8	3.13	1.14
19	I can easily choose a required software for a specific purpose in English language lesson.	8.4	17.7	36.1	28.2	9.5	2.91	1.33

Discussion

The current study was conducted with the aim of exploring the factors that the Iranian EAP students considered with regard to the pros of PBL in universities and its associated factors. It also investigated the students' attitudes toward the different elements of PBL through a validated questionnaire. The results of the exploratory factor analysis revealed four different leading factors in the implementation of PBL among Iranian EAP students. The factors were (1) *Project-Based Learning*, (2) *Collaborative Learning*, (3) *Use of Technology in Learning*, and (4) *Autonomous Learning*. The findings also indicated that the Iranian students had a generally positive attitude toward PBL, which is in line with some previous studies (e.g., Albanese & Mitchell, 1993; Dochy, Segers, Van den Bossche, & Gijbels, 2003; Reynolds & Hancock, 2010). With regard to the extracted factors underlying PBL, the findings of the current study were in line with majority of the previous studies found in the literature. For instance, some analogous factors such as collaborative and student-centered learning, as well as the significant role of teachers in educating autonomous learners, were advocated by Hmelo-Silver (2004) and Schmidt, Van der Molen, Te Winkel, and Wijnen (2009) to be among the main features of PBL.

The results also showed that overall, the Iranian EAP students favored project-based learning, considered collaborations and group-works so effective, had a positive attitude toward using technology in learning a language, and did not

consider themselves very independent from the teacher in language learning. For instance, nearly 40% of the participants believed that doing projects in English class will increase their interests in learning. Our results appear to be in harmony with Klegeris and Hurren (2011) who also reported that the students in the University of British Columbia had a positive attitude toward PBL and also increased levels of motivation were observed among them. This fact can be of significant importance since most university instructors around the world have difficulties motivating undergraduate students and keeping them involved in learning (Fukuzawa & Boyd, 2016). Similarly, Wiznia et al. (2012) also claimed that PBL could lead to more class activity and learner engagement among 100 American medical students. Their results showed that there was more interaction among the students, learning level increased, and also the students were more inclined to spend more time on their studies. By contrast, the current study is incompatible with Pohan, Asmin, and Menanti (2020), who reported no significant difference in the motivation of students who underwent the PBL approach and those who were taught based on the traditional approach.

When justifying the results, what first comes to mind is the important role of personal differences and personality traits among different students. The significant role of personal differences in the internalization of PBL was previously acclaimed by Frambach, Driessen, Beh, and Van der Vleuten (2014). Park et al. (2012) also asserted that the role of personal differences might be even greater than cultural differences. With regard to the findings of the current study, it needs to be noted that the reported results suggested that roughly an equal number of participants showed for-and-against attitudes toward group-based or individual works in language learning. This issue does not seem to be a simple one, but a complex one in nature. Accordingly, Frambach, Driessen, Beh, and Van der Vleuten (2014) also reported similar findings and claimed that this may be due to the fact that “some societies may be defined as collectivistic in certain aspects, but as individualistic in others” (p. 1018).

The obtained results also indicated that majority of the students had a positive attitude toward using technology in language learning. This finding may be due to the age level of the students, as the participants in this study were all undergraduate students. It would seem natural to associate youth with technology, as nowadays it seems unthinkable to live without technology. In this day and age, technology has influenced young people and their lives from different perspectives, and Iranian youth would not be an exception. Based on the findings, it can be argued that young people are mostly searching for novelty and modernism, and this tendency is further reflected in their education. In fact, the education sector around the world is increasingly attached to the complex and evolving use of technology, in its various forms and especially in the domain of language education. This widespread use of technology in education generally, and more specifically English language learning, may be due the easier access to information, increased interest in language learning, a rise in possible interactions and collaborations among students, and also the economic benefits of using technology in language learning (e.g., the use of internet and access to millions of free source materials). The results of the

current study seem to be in harmony with Fukuzawa and Boyd (2016) who also reported that after using computers and on-line courses based on PBL, there was an increase in the motivation and engagement of the students in the lessons as well as increased levels of collaboration among the students.

Furthermore, as mentioned before, it was observed that the students were not autonomous and needed some assistance in learning English. They also claimed that the presence of a teacher is essential for the whole language learning to be fulfilled. It needs to be noted that although PBL can be applied to every educational setting, the leading role of culture should not be forgotten. Cultural differences among the students from various cultural backgrounds can have an impact on the whole process of PBL implementation (Wijnia, Loyens, & Rikers, 2019). The PBL approach is still new in Iran, and Iranian students are accustomed to the traditional teacher-centered, exam-focused instructional approach. A great number of not only language classes, but classes on different other topics are held based on the traditional approach. Students are mostly required to memorize a bunch of reading materials and very seldom are invited to challenge an issue critically. In the same line, Frambach, Driessen, Beh, and Van der Vleuten's (2014) study on 88 medical university students from different cultures also said that those students with traditional educational backgrounds (e.g., the countries in the Middle East) faced more challenges with PBL and did not take much part in critical discussions. The same results on the role of the students' culture were also reported by Al Kadri et al. (2011), Bridger (2007), as well as Leung, Ginns, and Kember (2008). Hung, Moallem, and Dabbagh (2019) also stressed the important role of social factors in the successful implementation of PBL.

That may be the reason behind Hallinger and Lu's (2012) emphasis on the need to adapt PBL teaching materials and resources to the students' sociocultural living context. It also needs to be pointed out that PBL is a developing process, and the students may gain differently in the various stages of the PBL implementation. Frambach, Driessen, Beh, and Van der Vleuten (2014) also reported that the students' discussion skills and self-confidence level improved during the term. Likewise, the non-Western students finally could adapt themselves to the student-centered approach. Consequently, although the student-centered approach in PBL may confront the academia in some contexts with some hurdles, there is hope that the students of any personal or cultural backgrounds can successfully adapt to the PBL approach and there is no limitation in this regard.

Conclusion

The present study highlights the attitudes and perceptions of Iranian EAP students toward the principles of PBL. The results from a validated and piloted questionnaire from 379 Iranian university EAP students indicated that the participants generally favored PBL and considered it helpful and beneficial to their language learning experience. To put it differently, the students stated that problem-based learning would be much useful as collaboration and team-work among the students can increase learning. They also believed that the academia is supposed to use more

technology in language pedagogy. Finally, they considered themselves very much dependent on the teacher in the learning process.

It is argued that it would not be possible to run one ideal and perfect version of PBL (Wijnia, Loyens, & Rikers, 2019) due to its multifaceted nature. Therefore, care must be taken into account when applying PBL in a specific context. Teachers first need to decide on the type of knowledge the students are to acquire and also consider the students' socio-cultural background and previous educational experiences and accordingly plan an apt curriculum based on the students' needs and preferences. Also, another point to bear in mind is that, any reform will take some time to be established. Switching to a problem-based learning approach in a country which has mainly experienced traditional, teacher-centered pedagogical systems would not be an easy task. It may take some time for both the teachers and the students to adapt fully to this novel educational structure, and this itself further calls for more effort and attention from the stakeholders in the domain of education. To put it another way, teachers need to first be made aware of the underlying principles and theoretical foundations of PBL and later be trained on its successful application in the classrooms. The writers would argue that a successful translation of the theoretical knowledge on PBL into a real and practical application of its rules in the classrooms is in need of more attention. In this regard, holding some workshops and training programs stressing the significance of PBL and its accurate practice in classrooms can be beneficial. Furthermore, the educational material (in this case, English textbooks), also need to be adjusted to this shift from teacher-centered and lecture-based teaching methods to more student-centered ones.

In fact, it goes without saying that for having a better implementation of PBL in the classrooms, teachers need to first be completely prepared and equipped with the necessary materials and methods to handle the procedure successfully. In this regard and as mentioned before, the call for more attention to the issue of teacher education regarding the main tenets of PBL comes to the fore. Forthcoming research may explore the existence of PBL paradigms in teacher education courses along with the teacher educators' attitude toward PBL in teacher education courses. Also, there is a paucity of research on the impact of different cultural backgrounds on the learners' appreciation of PBL. This, itself, can be another line of research. Moreover, the present study was only limited to EAP undergraduate university students. Another significant avenue for research could be the examination of attitudes toward and perceptions of PBL among the students of lower (high school students) or higher educational levels (graduate levels).

References

Abdelkarim, A., Schween, D., & Ford, T. (2018). Attitudes towards problem-based learning of faculty members at 12 US medical and dental schools: A

- comparative study. *Journal of dental education*, 82(2), 144-151.
<https://doi.org/10.21815/JDE.018.019>
- Abdullah, M. H., & Tan, B. H. (2008). Wired together: Collaborative problem-based language learning in an online forum. *Malaysia Journal of ELT Research*, 4, 54-71. <http://journals.melta.org.my/index.php/majer/article/view/202>
- Albanese, M., & Mitchell, S. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine*, 68(1), 52-81. Retrieved from http://journals.lww.com/academicmedicine/Abstract/1993/01000/Problem-based_Learning__A_Review_of_Literature_on.20.aspx.
- Aliyue, M. M. (2017). *The effect of problem-based learning on metacognition and writing performance of Nigerian undergraduates*. (Unpublished doctoral thesis). University Putra Malaysia, Malaysia.
- Al Kadri, H. M., Al-Moamary, M. S., Magzoub, M. E., Roberts, C., & Van der Vleuten, C. P. M. (2011). Students' perceptions of the impact of assessment on approaches to learning: A comparison between two medical schools with similar curricula. *International Journal of Medical Education*, 2(1), 44-52.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4205515/>
- Ansarian, L., & Lin, T. M. (2018). *Problem-based language learning and teaching: An innovative approach to learn a new language*. Singapore: Springer.
- Arman, A. M. (2018). Students' attitudes toward problem based learning – Analog electronic course in the electrical engineering programs in PPU case study. *Journal of e-Learning and Higher Education*, 3(14), 1-19.
- Barrows, H. S. (1996). Problem-based learning in medicine and beyond: A brief overview. *New Directions for Teaching and Learning*, 68, 3-12.
- Barrows, H. S. (2000). *Problem-based learning applied to medical education*. Illinois: Southern Illinois University Press.
- Bejarano Beltran, D. P., Perez, G., & Yucely, D. (2016). *Using problem-based learning approach to experience values from a different perspective in the EFL classroom*. (Unpublished PhD dissertation). Corporación Universitaria Minuto de Dios, Spain.
- Bridger, J. (2007). From passive to active learners: The lived experience of nurses in a specialist nephrology nursing education programme. *Journal of Workplace Learning*, 19(2), 78-91.
- Briggs, N. E., & MacCallum, R. C. (2003). Recovery of weak common factors by maximum likelihood and ordinary least squares estimation. *Multivariate Behavioral Research*, 38(1), 25-56.

- Choi, E., Lindquist, R., & Song, Y. (2014). Effect of problem-based learning vs. traditional lecture on Korean nursing students' critical thinking, problem-solving, and self-directed learning. *Nurse Education Today*, 34(1), 52-56. <https://doi.org/10.1016/j.nedt.2013.02.012>
- Coffin, P. (2013). The impact of the implementation of the PBL for EFL interdisciplinary study in a local Thai context. *PBL across Cultures* (Proceedings from the 4th International Research Symposium on PBL 2013, Kuala Lumpur, Universiti Teknologi Malaysia), 191-197.
- Dewey, J. (1938). *Experience and education*. New York: Touchstone.
- Dochy, F., Segers, M., Van den Bossche, P., & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instruction*, 13(5), 533-568. *Doi: 10.1016/S0959-4752(02)00025-7*.
- Dole, S., Bloom, L., & Doss, K. K. (2017). Engaged learning: Impact of PBL and PjBL with elementary and middle grade students. *Interdisciplinary Journal of Problem-Based Learning*, 11(2), 9.
- Elizabeth, M. A., & Zulida, A. K. (2012). Problem-based learning: A source of learning opportunities in undergraduate English for specific purposes. *The International Journal of Social Sciences*, 3(1), 47-56.
- Eslami, Z. R. (2010). Teachers' voice vs. students' voice: A need analysis approach to English for academic purposes (EAP) in Iran. *English Language Teaching*, 3(1), 3-11. <https://eric.ed.gov/?id=EJ1081411>
- Eslami Rasekh, A., & Simin, S. (2011). Teaching English for specific purposes: A no man's land area of activity: Investigating ESP courses administrated in Iranian universities. *Online Journal for Teacher*, 32. <http://www.esp-world.info>
- Fard, E. E., & Vakili, A. (2018). The Effect of problem-based learning on Iranian EFL learners' vocabulary learning. *Journal of Asia TEFL*, 15(1), 208-218. *DOI:10.18823/asiatefl.2018.15.1.15.208*
- Farhady, H., Sajadi Hazaveh, F., & Hedayati, H. (2010). Reflection on foreign language education in Iran. *TESL-EJ*, 13(4), 1-18. <https://eric.ed.gov/?id=EJ898203>
- Field, A. (2009). *Discovering statistics using SPSS: Introducing statistical method*. Thousand Oaks, CA: Sage Publications.
- Fonseca Martínez, R. (2017). *An attempt to increase student talking time through task-based interaction among basic level language learners at ICPNA, Cajamarca branch (Master's thesis)*. Universidad de Piura, Peru. <https://hdl.handle.net/11042/2646>

- Frambach, J. M., Driessen, E. W., Beh, P., & Van der Vleuten, C. P. (2014). Quiet or questioning? Students' discussion behaviors in student-centered education across cultures. *Studies in Higher Education*, 39(6), 1001-1021. <https://doi.org/10.1080/03075079.2012.754865>
- Fukuzawa, Sh., & Boyd, C. (2016). Student engagement in a large classroom: Using technology to generate a hybridized problem-based learning experience in a large first year undergraduate class. *The Canadian Journal for the Scholarship of Teaching and Learning*, 7(1), 1-14. <http://dx.doi.org/10.5206/cjsotl-rcacea.2016.1.7>
- Guimarães, L., & Lima, R. (2021). Changes in teaching and learning practice in an undergraduate logistics and transportation course using problem-based learning. *Journal of University Teaching & Learning Practice*, 18(3), 1-12.
- Hallinger, P., & Lu, J. (2012). Overcoming the Walmart Syndrome: Adapting problem-based management education in East Asia. *Interdisciplinary Journal of Problem-Based Learning*, 6(1), 16-42. <https://doi.org/10.7771/1541-5015.1311>
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235-266. <https://doi.org/10.1023/B:EDPR.0000034022.16470.f3>
- Hmelo-Silver, C. E. (2013). Creating a learning space in problem-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 7(1), 24-39. <https://doi.org/10.7771/1541-5015.1334>
- Huang, K. S. (2012). A study on the incorporation of problem-based learning (PBL) in a university freshman English class. *The Journal of International Management Studies*, 7(2), 125-134. DOI:10.18823/asiatefl.2018.15.1.15.208
- Hung, W., Moallem, M., & Dabbagh, N. (2019). Social foundations of problem-based learning. In M. Moallem, W. Hung, & N. Dabbagh (Eds.), *The Wiley handbook of problem-based learning*, (pp. 51-79). Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Hwang, G. J., Hsu, T. C., Lai, C. L., & Hsueh, C. J. (2017). Interaction of problem-based gaming and learning anxiety in language students' English listening performance and progressive behavioral patterns. *Computers & Education*, 106, 26-42. <https://doi.org/10.1016/j.compedu.2016.11.010>
- Juandi, D. (2021, January). Heterogeneity of problem-based learning outcomes for improving mathematical competence: A systematic literature review. *Journal of Physics: Conference Series*, 1722(1), 012108. IOP Publishing.
- Kaiser, H. F. (1970). A second generation little jiffy. *Psychometrika*, 35(4), 401-415.

- Kaiser, H. F. (1974). A computational starting point for Rao's canonical factor analysis: Implications for computerized procedures. *Educational and Psychological Measurement*, 34, 691-692.
- Kim, N. J., Belland, B. R., & Axelrod, D. (2018). Scaffolding for optimal challenge in K-12 problem-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 13(1), 1-23. <https://doi.org/10.7771/1541-5015.1712>
- Klegeris, A., & Hurren, H. (2011). Impact of problem-based learning in a large classroom setting: Student perception and problem-solving skills. *Advances in physiology education*, 35(4), 408-415. <https://doi.org/10.1152/advan.00046.2011>
- Lee, K. Y., & Kwan, C. Y. (2014). *PBL: What is it? The use of problem-based learning in medical education*. McMaster University. http://fhs.mcmaster.ca/mdprog/pbl_what.html
- Leung, D. Y. P., Ginns, P., & Kember, D. (2008). Examining the cultural specificity of approaches to learning in universities in Hong Kong and Sydney. *Journal of Cross-Cultural Psychology*, 39(3), 251-266.
- Li, H. C., & Tsai, T. L. (2018). Investigating teacher pedagogical changes when implementing problem-based learning in a year 5 mathematics classroom in Taiwan. *The Asia-Pacific Education Researcher*, 27(5), 355-364.
- Lin, L. F. (2017). Impacts of the problem-based learning pedagogy on English learners' reading comprehension, strategy use, and active learning attitudes. *Journal of Education and Training Studies*, 5(6), 109-125. <https://eric.ed.gov/?id=EJ1141432>
- Liu, M., Liu, S., Pan, Z., Zou, W., & Li, C. (2019). Examining science learning and attitude by at-risk students after they used a multimedia-enriched problem-based learning environment. *Interdisciplinary Journal of Problem-Based Learning*, 13(1), 6-19. <https://doi.org/10.7771/1541-5015.1752>
- Liu, M., Shi, Y., Pan, Z., Li, C., Pan, X., & Lopez, F. (2020). Examining middle school teachers' implementation of a technology-enriched problem-based learning program: Motivational factors, challenges, and strategies. *Journal of Research on Technology in Education*, 52(2), 1-17. DOI: 10.1080/15391523.2020.1768183
- Lukovics, M., & Zuti, B. (2015). New functions of universities in century XXI towards "fourth generation" universities. *Journal Transition Studies Review*, 22(2), 33-48. <https://doi.org/10.14665/1614-4007-22-2-003>
- Merritt, J., Lee, M. Y., Rillero, P., & Kinach, B. M. (2017). Problem-based learning in K-8 mathematics and science education: A literature review. *Interdisciplinary Journal of Problem-Based Learning*, 11(2), 1-12. <https://doi.org/10.7771/1541-5015.1674>

- Meyers, L. S., Gamst, G. C., & Guarino, A. J. (2013). *Performing data analysis using IBM SPSS*. John Wiley & Sons.
- Nariman, N., & Chrispeels, J. (2015). PBL in the era of reform standards: Challenges and benefits perceived by teachers in one elementary school. *Interdisciplinary Journal of Problem-Based Learning*, 10(1), 1-15. <https://doi.org/10.7771/1541-5015.1521>
- Orji, C. T., & Ogbuanya, T. C. (2018). Assessing the effectiveness of problem-based and lecture-based learning environments on students' achievements in electronic works. *International Journal of Electrical Engineering Education*, 55(4), 334-353.
- Othman, N., & Shah, M. I. A. (2013). Problem-based learning in the English language classroom. *English Language Teaching*, 6(3), 125-134.
- Pallant, J. (2007). *SPSS survival manual: A step by step guide to data analysis using SPSS for Windows (3rd ed.)*. England: McGraw Hill.
- Park, H. S., Levine, T. R., Weber, R., Lee, H. E., Terra, L. I., Botero, I. C., Bessarabova, E., Guan, X., Shearman, S. M., & Wilson, M. S. (2012). Individual and cultural variations indirect communication style. *International Journal of Intercultural Relations*, 36(2), 179-187. <https://doi.org/10.1016/j.ijintrel.2011.12.010>
- Plonsky, L., & Gonulal, T. (2015). Methodological synthesis in quantitative L2 research: A review of reviews and a case study of exploratory factor analysis. *Language Learning*, 65(S1), 9-36.
- Pohan, A. M., Asmin, A., & Menanti, A. (2020). The effect of problem based learning and learning motivation of Mathematical problem solving skills of class 5 students at SDN 0407 Mondang. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, 3(1), 531-539.
- Reynolds, J. M., & Hancock, D. R. (2010). Problem-based learning in a higher education environmental biotechnology course. *Innovations in Education and Teaching International*, 47(2), 175-186. DOI: 10.1080/14703291003718919
- Savery, J. R. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1), 5-15. <https://doi.org/10.7771/1541-5015.1002>
- Schmidt, H. G. (2012). A brief history of problem-based learning. In G. O'Grady, E. Yew, & K. P. L. Goh (Eds.), *One-day, one-problem: An approach to problem-based learning* (pp. 21-40). Singapore: Springer.
- Schmidt, H. G., Van der Molen, H. T., Te Winkel, W. W. R., & Wijnen, W. H. F. W. (2009). Constructivist, problem-based learning does work: A meta-

analysis of curricular comparisons involving a single medical school. *Educational Psychologist*, 44(4), 227-249.

<https://doi.org/10.1080/00461520903213592>

- Schmidt, H. G., Rotgans, J. I., & Yew, E. H. J. (2019). Cognitive constructivist foundations of problem-based learning. In M. Moallem, W. Hung, & N. Dabbagh (Eds.), *The Wiley Handbook of Problem-Based Learning* (pp. 25-50). Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Servant-Miklos, V. F. C., Norman, G. R., & Schmidt, H. G. (2019). A short intellectual history of problem-based learning. In M. Moallem, W. Hung, & N. Dabbagh (Eds.), *The Wiley handbook of problem-based learning* (pp. 3-24). Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Shin, L. K., & Azman, N. (2014). Problem-based learning in English for a second language classroom: Students' perspectives. *International Journal of Learning*, 18(6), 109-126.
- Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research*, 69(1), 21-51.
- Sy, R., Adnan, A., & Ardi, H. (2013). The effect of problem based learning strategy toward students' speaking ability at the first grade of SMAN 1 Enam Lingkungan. *Journal of English Language Teaching*, 2(1), 314-323. <https://doi.org/10.24036/jelt.v2i1.2619>
- Tabachnick, B. T., & Fidell, L. S. (2013). *Using multivariate statistics*. Boston: Allyn and Bacon.
- Ulger, K. (2018). The effect of problem-based learning on the creative thinking and critical thinking disposition of students in visual arts education. *Interdisciplinary Journal of Problem-Based Learning*, 12(1), 10-21.
- Ungaretti, T., Thompson, K. R., Miller, A., & Peterson, T. O. (2015). Problem-based learning: Lessons from medical education and challenges for management education. *Academy of Management Learning & Education*, 14(2), 173-186. <https://doi.org/10.5465/amle.2013.0245>
- Wee, L. K. N., & Kek, M. Y. C. A. (2002). *Authentic problem-based learning: Rewriting business education*. Singapore: Prentice Hall.
- Wijnia, L., Loyens, S. M., & Rikers, R. M. (2019). The problem-based learning process: An overview of different models. In M. Moallem, W. Hung, & N. Dabbagh (Eds.), *The Wiley handbook of problem-based learning* (pp. 273-295). Hoboken, NJ: Wiley.
- Wiznia, D., Korom, R., Marzuk, P., Safdieh, J., & Grafstein, B. (2012). PBL 2.0: Enhancing problem-based learning through increased student participation. *Medical education online*, 17(1), 173-175. <https://doi.org/10.3402/meo.v17i0.17375>

Wong, K. K. H., & Day, J. R. (2009). A comparative study of problem-based and lecture-based learning in junior secondary school science. *Research in Science Education*, 39(5), 625-642.

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