Views of Turkish EFL teacher trainees toward technology-integrated PBL practices

Yasemin Kırkgöz [a,1,*], Burcu Turhan [b,2]

[a] Çukurova University, Balcalı, Çukurova Üniversitesi Rektörlüğü, 01330 Sarıçam/Adana, Turkey
[b] Hatay Mustafa Kemal University, Alahan, Hatay Cd. Tayfur Sökmen Kampüsü, 31060 Alahan-Antakya/Antakya/Hatay, Turkey
[1] ykirkgoz@gmail.com *; [2] burcu.oyp@gmail.com
* corresponding author

ARTICLE INFO

Article history
Received 24 February 2021
Revised 31 March 2021
Accepted 20 April 2021

Keywords
problem-based learning
teacher education
teacher trainees

ABSTRACT

Problem-Based Learning (PBL) is increasingly becoming popular in teacher education, just like the prevalence in the use of Modular Object Oriented Dynamic Learning Environment (Moodle) which is an instructional socio-constructivist online tool providing collaborative learning. PBL where learning occurs through real-life problem solving practices is also included in the constructivist approach. This study was designed as a mixed methods research in which English as Foreign Language (EFL) teacher trainees were involved in PBL through Moodle with the aim of solving problems related to language teaching and learning which they encountered at practicum schools. Participants were 93 EFL teacher trainees studying at a state university in Turkey. The study aimed to reveal the participants' views of their PBL experiences within the scope of a Materials Evaluation and Adaptation Course. Data were collected through questionnaires and interviews; and analyzed through descriptive statistics and content analysis consecutively. Results demonstrated that the teacher training activities delivered through PBL yielded promising benefits for EFL teacher trainees' professional development despite some minor flaws faced in the process. Thus, PBL can be considered as a useful method to deliver such courses offered in any branches of teacher education.

How to Cite: Kırkgöz, Y., & Turhan, B. (2021). Views of Turkish EFL teacher trainees toward technology-integrated PBL practices. *English Language Teaching Educational Journal, 4*(1), 74-86. 10.12928/eltej.v4i1.3748

1. Introduction

PBL was originally developed to promote competencies of medical students in clinical problem-solving (Barrows, 1983). In a more recent study with medical students, Stentoft (2019) showed that PBL improved students' competencies in medical research. Following advances in medical education, other professional fields have adopted PBL such as engineering education (e.g. Woods, 2021), business education (e.g. Buff, 2011), nursing education (e.g. Oja, 2011) and health education (e.g. Chagas, Faria, Mourato, Pereira & Santos, 2012), and so on. Over time, PBL has proved to be an effective instructional approach in teacher education (Kırkgöz, 2015; 2017; 2018). Edwards and Hammer (2006) state that teacher education is a field of training especially suited to educational objectives and techniques required in PBL. In their study, real-life problems for prospective early childhood and primary teachers were utilized, and factors creating a gap between theory and practice as well as possible solutions were investigated. Findings revealed that PBL can be implemented as a pedagogical adult teaching tool. In Kırkgöz's (2015) case study with prospective English teachers, the

most eye-catching benefit is that PBL closes the gap between theory and practice; and this in turn fosters prospective teachers' ability to identify real problems, generate solutions and use both theoretical and practical resources to support the solution. Avcı, Akıncı and Bakioğlu (2012) used real-life problem scenarios for developing prospective teachers' classroom management skills in their research and suggested that PBL was more efficient than other traditional methods. Reviewing other work on PBL (e.g. Borhan, 2014), it can be concluded that PBL experience within teacher education caters to opportunities for prospective teachers in terms of acquiring knowledge and skills through experiencing real-life problems.

In PBL, students work in groups to find solutions to complex problems (Ferreira & Trudel, 2012). The group members generally share a common goal, feel supported by their peers, value their learning, become more competent, and they are more successful to cope with learning challenges (Tan, Van der Molen & Schmidt, 2016). Furthermore, studies reveal that PBL has the potential to improve higher-order thinking skills, comprehension and application of knowledge along with learning attitudes and motivation (Jerzembek & Murphy, 2013). To achieve all these, students' ability to be self-directed in their learning is a pre-requisite for PBL, and teachers should ensure that students have this ability at an optimal level. If teachers and students are too novice to deal with responsibilities of such a learning environment, they may need to adjust their current learning styles/strategies (English & Kitsantas, 2013).

There are a great number of studies regarding PBL and students' learning outcomes. Walker et al. (2011) found that classroom teachers from rural school districts, who designed PBL activities in a professional development program, reported gains in terms of their knowledge, experience and confidence. In Pecore's (2013) case study concerning a week-long PBL professional development of two experienced and two novice high school teachers, teachers' level of beliefs in constructivist principles prior to attending the study impacted their extent of employing these principles to their PBL experiences. In a quantitative study by Wijnen et al. (2017), law teachers who had undergone a five-day professional development program pointed out that students learned more through the traditional teaching method and expressed dissatisfaction with PBL.

Regardless of its prevalence and benefits, framing effective PBL problems may be time-consuming and requires intensive research (Ribeiro, 2011). Relatedly, this can create stress on teachers and cause their motivation toward teaching through PBL to decrease. Besides,-developing students' self-directed learning skills (Hung, 2011) and classroom management (Ribeiro, 2011) can be challenging issues in PBL. In order to minimize those disadvantages, combining Moodle with face-to-face meetings during PBL practices may be logical since Moodle allows learners to use various interactive module activities such as assignments, chat, exam, forum, survey, quiz, wiki and so on. Zainuddin, Idrus and Jamal (2016) proposed that postgraduate Malaysian students prefer to use news, forum and assignment tools of Moodle, the most. In Paschalis's (2017) study including collaborative project-based learning via Moodle at the department of Electrical and Computer Engineering, results indicate such benefits as a better level of collaboration, cognitive performance of Greek students and guidance role of teachers. Likewise, Alario-Hoyos et al. (2015) found that Spanish students' grades and motivation in the Introduction to Computer Networks course improved significantly in the collaborative distance learning environment compared to face–to–face instructions. In that sense, PBL and Moodle seem to be consistent in terms of enhancing both collaboration and learning gains.

For higher education, the meta-synthesis of the meta-analytical research on the effectiveness of PBL put emphasis on the fact that PBL is more effective than lecture-based instruction regarding long-term retention and skills development (Strobel & Barneveld, 2009). For this reason, PBL-oriented teacher education practices should be added into the curricula of foreign language teacher education programs so that teacher trainees could gain sustainable knowledge and skills in their profession. Besides, it is crucial to integrate online learning/teaching environments like Moodle into PBL-led teacher education practices so that teacher educators and trainees could benefit from activities of teacher training combining PBL and Moodle because professional development is critical for teachers adopting new roles and competencies in online teaching environments (Adnan, 2017). In light of these, the motive of this study is the belief that incorporating PBL in a teacher education course could give teacher trainees an idea on how to teach a lesson through PBL and Moodle. Hence, this study contributes to the relevant literature on the use of PBL in teacher education and the reactions of teacher trainees to the practices conducted through PBL. Accordingly, the study revolves around this research

question: What are the views of Turkish EFL teacher trainees about technology-integrated PBL practices?

2. Method

2.1. Research Design

This mixed methods study was conducted in the "Materials Evaluation and Adaptation Course" offered in the last year of study in an English language teacher education program in Turkey. EFL teacher trainees took the course during 14 weeks, when they concurrently participated in real teaching experiences in practicum schools. In the first three weeks, they were provided with theoretical knowledge on evaluation/adaptation of language teaching materials through teacher-led lectures accompanied by some practical experiences in materials evaluation. In the following weeks, an online PBL application through Moodle was fulfilled. The use of Moodle was assumed to be fruitful because it could make the course more interactive which would provide the trainees with the ability to communicate at any time and place. In practical terms, Moodle was the learning management system which both the tutor and the trainees had experience in using. Participants worked in groups of four during the process. Trainee groups were self-selected providing 23 groups of four and one group of five, each of which worked on two different problems throughout the whole process. Two of the sample problems undertaken by the trainees are outlined below:

> *"During our observations, we noticed that the high school students who had elementary proficiency level in English were having difficulties understanding what to do in a variety of activities in the English textbook used in the lesson. They were complaining that they could not understand the instructions. So we decided to take a closer look. Instructions were highly complicated for an elementary level class. Some of them were also not clear. We want to focus on this problem and offer some solutions."*

> *"From our observation of the students in the secondary school Class 6/A, we realized that students were having a hard time using grammar correctly even though they had just learned it. We thought that it was about the lack of exercises. But when we took a closer look, we concluded that there were not any practice stage exercises in the English textbook. The book lacked the practice stage of the learning methodology and went straight into the production stage. Thus, the students had trouble making sentences. We would like to focus on solving this problem and with our group members prepare some communicative grammar practicing activities and observe their effect on the students' using grammar communicatively."*

First, participants were informed about the steps that they should take weekly. Each group brainstormed about the identified problem related to language teaching materials which they identified through their observation in schools, and prepared a report about the generating issues such as new concepts, ideas and resources on the way to solving the problem at hand. Afterwards, group members constructed tentative solutions collaboratively. The solutions were shared and discussed via forums available in Moodle so that all trainees could gain insights on each other's work and give feedback. This was followed by the employment of research to collect and analyse data. After discussing research findings, each group implemented their solutions to real problems in practicum schools. Within this period, the tutor, the first author of this study, continued to give ongoing feedback to the participants via Moodle. At the end, groups wrote their PBL practices and presented them to their peers. Namely, the process was experienced through textual communication via Moodle in an asynchronous way. That is, participants and the tutor had the chance to interact at different times when it best suited the schedules of both the tutor and the participants.

Before the current study, a face-to-face PBL course was offered in the previous year following the steps outlined above (See Kırkgöz, 2015 for details). After the successful implementation of PBL in that course, this study was implemented integrating technology so that the course could be more effective. In fact, what makes this study different is that all aforementioned processes were followed through Moodle as an online learning tool and a teaching platform used subsequent to a few face-to-face meetings at the outset. To summarize, the ultimate aim was to improve the efficacy of the course through PBL rather than learning how to apply PBL in language teaching. For the related literature,

the study is assumed to open a new road to understanding how PBL-led teacher education courses increases the opportunities to make real-life-like learning practices.

2.2. Participants

Participants of the study comprised 93 EFL teacher trainees (22 males, 71 females) at a state university in Turkey. Their ages ranged from 21 to 24. All were senior students and completed methodology courses such as Teaching English to Young Learners, Approaches in Language Teaching, Teaching Language Skills and so on. The rationale for involving those students was that they had sufficient knowledge in language teaching methodologies. Thus, they would be able to become familiar with PBL more professionally although they did not have any PBL experience beforehand. They just knew the theory and steps of PBL and were expected to put their theoretical knowledge into practice. In fact, all the trainees who were enrolled in the Materials Evaluation and Adaptation course at the time of the study gave consent for the participation in the research. For ethical considerations, participants were announced that they would be involved in a scientific study and informed of the study procedures and what they were expected to perform during the study.

2.3. Data Collection Tools

The data were gathered through a written questionnaire composed of 6-point Likert-type questions from strongly disagree (1) to strongly agree (6) and interviews. There were 29 Likert-type questions categorized under three sub-sections. Section A (14 questions) investigated participants' opinions about PBL in general. Section B (12 questions) aimed to find out benefits of participating in a PBL-led course. Section C (3 questions) covered participants' responses to the question "Why should PBL be a part of other courses?" Regarding interviews, there were 10 questions associated with feelings toward PBL (e.g. How do you feel about being a part of such PBL practices?), knowledge/skills gained during this process (e.g. Do you believe that you have gained any skills or knowledge as a result of such PBL practices?), difficulties encountered (e.g. Are there any challenges you have experienced during the PBL practices? If yes, what are those challenges?), and the use of Moodle (e.g. Are there any advantages or disadvantages of using Moodle during the PBL practices?). Questionnaire items and interview questions were formulated in the light of the relevant literature (See Kırkgöz, 2017). A small-scale piloting was conducted to check the appropriateness and understandability of the interview questions. To ensure reliability of the quantitative data, questionnaire items were exposed to a reliability test via SPSS and Cronbach's Alpha Coefficient was found to be .90, indicating that all items yielded reliable results.

2.4. Data Analysis Techniques

As the data collection tools provided quantitative and qualitative data, both statistical and content analysis techniques were employed. For the analysis of quantitative data emerging from Likert-type questions ranging from 1(strongly disagree) to 5(strongly agree), descriptive statistics such as mean and standard deviations (SD) were utilized. The qualitative data obtained from audio-recorded interviews were transcribed verbatim and analysed through content analysis performed by the authors of this study. The qualitative data analysis continued with the division of the text into segments of information which were labelled with appropriate codes for the sake of data reduction; and the determined codes were collapsed into themes (Creswell, 2012). Both researchers analyzed the whole qualitative data individually to unravel relevant themes inductively through repeated examination and comparison of the raw data. Afterwards, ambiguous categories were clarified through joint discussion for the sake of inter-rater reliability. Each participant was coded as "P1, P2, and P3…"

3. Findings and Discussion

3.1. Results from the Close-ended Questions

The results concerning general opinions about the PBL practices are presented in Table 1.

Table 1. Opinions in Relation to PBL in General

Section A	Mean	SD
A4. The PBL project enabled me to develop a deeper understanding of the topic I studied.	4.44	1.80
A12. Focusing on real problems made the PBL course more relevant to my interests.	4.39	1.66
A6. The PBL project was helpful.	4.36	1.74
A10. PBL was a very helpful learning experience for my future work in research and teaching profession.	4.31	1.78
A8. With this PBL project, I learned more information about my research topic since it is more real-life related.	4.35	1.76
A11. PBL gave me a real world experience.	4.35	1.69
A5. I liked doing research in a structured manner during the PBL course.	4.32	1.55
A14. I learned from each other via Moodle during group works.	4.27	1.62
A3. The PBL course provided peer and group interactions useful to me in completing the tasks.	4.22	1.85
A9. I learned greater understanding and experience with group interactions in Moodle.	4.12	1.70
A2. The PBL course required more effort on my part than other courses.	4.07	1.54
A13. I found the PBL course via Moodle interesting.	4.03	1.58
A1. The PBL course required more of my time than the other courses.	4.04	1.42
A7. The PBL course was frustrating.	3.25	1.77

As can be inferred from Table 1, most of the items had similar mean scores except for Item 7 which had the lowest mean score indicating that the majority of the participants were of the opinion that PBL was not frustrating; rather, it was helpful, especially for their profession and future work in research. With regard to other items in Section A, they had an average mean score out of 6 because all items except for Item 7 had mean scores between 4.03 and 4.44. That is, most of the participants agreed moderately or slightly with the items. In other words, they had positive opinions about PBL in general. For instance, they believed that PBL was beneficial for group interactions as it enabled them to make structured research and develop deeper understanding. This might be because PBL was found to be real-life related. Moreover, most of the participants thought that PBL was relevant to their interest and via Moodle, it was even more interesting. Despite these, a great deal of participants supported the idea that PBL required more time and effort. Additionally, benefits of PBL were investigated, and results are shown in Table 2.

Table 2. Benefits of PBL

Section B	Mean	SD
B3. I improved critical and analytical thinking skills thanks to PBL.	5.32	0.82
B11. I improved research skills during the PBL course.	5.31	0.87
B12. I learned how to analyze and organize information collected from various sources during the PBL course.	5.37	0.88
B5. PBL helped me think deeper about the topic I studied.	5.27	0.93
B2. I learned how to apply information to solve a real world problem about teaching English.	5.22	0.87
B4. I improved to think independently during the PBL course.	5.20	0.89
B6. I improved self-learning during the PBL course.	5.18	1.05
B7. I learned how to cooperate with friends via Moodle.	5.13	1.13
B10. I improved academic skills (project writing, reading, etc.) during the PBL course.	5.13	0.97
B1. I improved identifying realistic problems relevant to my teaching.	5.10	0.86
B8. I improved communication skills in general.	4.94	1.06
B9. I improved how to resolve disagreements in the group and reach consensus.	4.88	1.22

Based on Table 2, it is clear that the most remarkable items which have the highest mean scores are B2, B3, B5, B11 and B12, demonstrated that participants believed that PBL was beneficial mainly because it provided them the opportunity to apply knowledge, to improve thinking and research skills and to analyse or organize information. Concerning the lowest mean scores which belong to the items

B8 and B9, benefits such as improvement of communication and teamwork skills might not be as significant as other benefits mentioned above. Yet, all of the mean scores can be accepted as considerably high; thereof, a great deal of participants were in consensus on the benefits of PBL in identifying and solving real problems; improving thinking, teamwork and self-learning skills, communication and academic skills and so forth.

Lastly, Table 3 displays participants' views on whether PBL should be a part of other courses.

Table 3. Responses to the Question "Why should PBL be a part of other courses?"

Section C	Mean	SD
C1. It definitely helps with getting out of midterm and final exams and follow different ways of learning.	5.04	0.94
C2. With more real-life related PBL experiences, we as students can learn more and relate it to our own life experiences.	5.19	0.92
C3. It helps us to use in-class information we learn outside of class.	5.37	0.89

According to Table 3, most of the participants were of the opinion that PBL could be a part of other courses because it required them to follow different ways of learning such as establishing relations to one's own life or making use of information in real life. That is, PBL could be beneficial in terms of making content more real-life like and concrete. Participants also believed that PBL helped them get rid of standard evaluation techniques such as mid-term and final examinations, which possibly create anxiety.

Table 4 sheds light on the overall results for each section in the questionnaire.

Table 4. Total Results of Sections in the Questionnaire

Total Results	Mean	SD
Section A (PBL in general)	4.15	1.32
Section B (Benefits of participating in PBL)	5.17	0.71
Section C (Should PBL be a part of other courses?)	5.20	0.78
Overall	4.70	0.71

Table 4 shows that Section B and C have approximately the same mean and standard deviation scores, which means participants mostly agreed with items in those sections. To clarify, they generally had the opinion that being a part of a PBL practice enabled them to gain various benefits; for this reason, they thought that PBL should be a part of other courses. As for Section A, it has a lower mean score when compared to other sections; however, it still has an average mean score. Namely, participants agreed with items in this section, but their agreement level was not as high as with items in other sections.

3.2. Interview Results

Responses of 88 participants to 10 interview questions were subjected to inductive content analysis, and four primary themes emerged. These themes were organized under the headings of "Feelings toward PBL, Knowledge and Skills Gained through PBL, Difficulties Faced during PBL and The Use of Moodle during PBL".

1) 3.2.1. Feelings toward PBL

Feelings regarding PBL experiences were categorized under two sub-headings as in Table 5. Table 5 illustrates feelings about oneself and the PBL experience. Feeling good about PBL was the most cited point (f:25), as understood from the excerpts below:

> *"I feel good about taking this PBL course because I learnt many things, and also how to overcome real problems that I faced in the classroom and in daily life."* (P59)

> *"I feel pretty good to be a part of the PBL practice since it was highly real-life related and gave chances to use what we learnt in real life environment."* (P30)

Table 5. Feelings toward PBL

Feelings about oneself	f	Feelings about the experience	f
Good	25	Useful	21
Happy	9	Helpful	8
Joyful	8	Difficult	5
Independent	3	Effective	4
Confident	2	Interesting	4
Lucky	1	Necessary	1

Following this, participants were also of the opinion that PBL was useful (f:21). One of the participants gives details about this issue in the excerpt below:

> *"I feel that PBL was really useful because I could do academic work on my own. We were asked to prepare an academic work and we could achieve it successfully."* (P33)

Apart from this, participants felt happy (f:9) and joyful (f:8) about PBL, as implied in the excerpt below:

> *"I feel satisfied and happy because I learnt deep information about my research topic, and taking part in PBL was very enjoyable."* (P25)

The PBL experience was found to be helpful (f:8), effective (f:4), interesting (f:4) and necessary (f:1). One of the participants mentions all these in the following excerpt:

> *"We were free in choosing our topic and totally independent. Therefore, it was really effective in encouraging us to use our creativity, and it was an interesting experience for me."* (P55)

The only negative feeling about PBL was that it could be difficult (f:5) for some participants, as illustrated in the excerpt below:

> "*It is a bit difficult but I learnt many things about my profession."* (P77)

Among the least referred feelings, there were feelings such as being independent (f:3), confident (f:2) and lucky (f:1). As to the course, the least frequent feeling is that the course was necessary (f:1). All these show that feelings toward PBL were positive for the great majority of participants.

> *"Research was very hard for me but a real-life like practice made me feel that I could rely on myself. Also, group work improved my responsibility. That is, I was lucky in that sense."* (P12)

> *"We feel more independent and confident. We can do research thoroughly because there is no time limit. Also, we learnt more and better."* (P1)

2) Knowledge and skills gained through PBL

Regarding knowledge and skills gained, Table 6 represents what is learnt in consequence of the course:

Table 6. Knowledge and Skills Gained through PBL

I learn how to	f	I learn how to	f
Make research	35	Regulate self-learning	5
Solve real-life like problems	23	Make observations	4
Work in groups	22	Make evaluations	3
Think critically	11	Make implementations	2
Acquire academic skills	8	Learn in different ways	2
Organize information	7	Acquire different teaching skills	2
Communicate effectively	6	Be independent	1
Analyze the data at hand	5	Take responsibility	1

Table 6 illustrates that the most frequent knowledge/skills gained thanks to PBL are conducting research (f:35), solving real-life problems (f:23) and working in groups (f:22). The following excerpts point to these issues:

> *"I learnt focusing on real problems and how to solve them. I learnt how to solve disagreements in the group. In addition, this practice enabled me to develop deeper understanding by making research."* (P22)

> *"I improved research skills because I studied a real problem and searched for information about it. The practice also provided group interaction."* (P17)

Following this, thinking critically (f:11) is another highly cited skill by the participants, as indicated in the excerpt below:

> *"I became more creative with PBL because I learnt how to think critically."* (P 13)

Regarding the rest of the skills and knowledge, improvement of academic skills (f:8), organizing information (f:7), effective communication (f:6), data analysis (f:5), regulating self-learning (f:5), making observation (f:4), evaluation (f:3) and implementation (f:2), being familiar with new learning (f:2) and teaching ways (f:2) can be mentioned.

> *"I learnt how a good group interaction should be. I also became familiar with research skills. I learnt different ways to organize and analyse information."* (P13)

> *"I experienced a student-centered teaching because we had a chance to enhance different learning and teaching ways. We evaluated what we observed and made implementations."* (P48)

Even though learning how to study independently and take responsibility were the ones referred to only once, they were worth mentioning because such a PBL practice required participants to share responsibilities and do their own task independently, and these helped participants work individually and collaboratively. The excerpt below indicates this:

> *"We all had a different responsibility in the course, first we studied independently and then we shared what we learnt with each other."* (P51)

3) Difficulties faced during PBL

Along with the fruitful aspects of PBL, some difficulties were revealed as listed in Table 7.

Table 7. Difficulties Experienced during PBL

Difficulties	f
*No difficulty at all	34
Working in groups	22
Technological problems	17
Consuming much time	8
Getting feedback	3
Data analysis	2
Conducting questionnaires	2
Making observation	1
Making much effort	1

Table 7 summarizes difficulties encountered during PBL; however, a great number of the participants agreed on the fact that they did not experience any difficulties (f:34). The following two excerpts are the indicators of this:

> *"I did not face any problem or difficulty."* (P24)

> *"I did not face important difficulties. Even if I faced, I would solve them with the help of my friends and teacher."* (P19)

Apart from this, the most problematic situation (f:22) was linked to working in groups, as expressed in the following excerpt:

> *"Of course, it required more effort so we tried to work harder and because of group works, we faced some difficulties. For example, it was hard to come together with group members."* (P71)

Another noteworthy difficulty was associated with technological problems (f:17 in total), such as the use of Moodle (f:9), Internet disconnection (f:5), using blogs (f:1), and computer-related problems (f:2). In relation to this, one of the participants reported:

> *"Usually, we experienced some technological problems. For example, my internet connection broke down. Trying to solve such problems might be irritating."* (P66)

Consuming so much time (f:8) was another difficulty. Moreover, participants might have difficulty in receiving detailed feedback, most probably because PBL was conducted through Moodle:

> *"The practice caused me to spend most of my time. Analysing and organizing information were a little bit frustrating and we received limited feedback. Using Moodle was sometimes difficult."* (P26)

Data analysis, conducting questionnaires, making observations and making much effort were among the other cited difficulties. Furthermore, one participant brought a new dimension to the issue, as expressed in the excerpt below:

> *"We had always been educated in traditional teacher-centered classes. The difficulty was that we engaged in something entirely different from our previous learning experiences."* (P48)

4) The use of Moodle during PBL

Participants' views upon the use of Moodle during the process are reported in Table 8.

Table 8. Opinions in Relation to the Use of Moodle

Positive Opinions	f	Negative Opinions	f
Useful	42	Complicated, difficult, confusing	10
Being glad	10	Problematic because of Internet	2
Time saving	7	Not enjoyable	1
Makes the learning easier	5	Not useful	1
Practical	3	Not sufficient	1
Good if it is taught	1		
Independent work	1		
Interesting	1		
Better understanding	1		
Total	71		15

As understood from Table 8, in terms of positive opinions, the participants primarily described the use of Moodle in the PBL practice as useful (f:42). Using Moodle in the PBL practice made participants glad (f:10). Following excerpts explain this:

> *"I think using Moodle is very useful for both students and teachers. You can do your task in a short time and you can take feedback quickly."* (P88)

> *"It is a useful method because all of us come together at any time; we can fulfil our responsibilities with the help of feedback."* (P45)

> *"I am glad about using Moodle. We could see each other's studies. We have learned a lot from each other's mistakes."* (P73)

Apart from these positive opinions, participants also believed that integration of Moodle in PBL was time-saving (f:7), made learning easier (f:5) and practical (f:3). Among positive opinions cited only once, participants thought that Moodle was interesting and provided independent learning opportunities and better understanding.

"It was useful; we did not spend much time to show our project to the teacher." (P12)

"It is quite practical as it gave us a chance to reach group members at the same time." (P30)

In terms of negative opinions, a number of participants (f:10) claimed that the use of Moodle was initially complicated, difficult or confusing:

"First, it was difficult to use it but I learnt how to use it in a short time." (P15)

"At first, it was a bit confusing but as the time passed, I liked it." (P13)

Besides the aforementioned, there were a few participants stating that integration of Moodle was problematic because of Internet problems. They also proposed that Moodle was not useful, enjoyable and sufficient:

"Internet disconnections were creating problems for us." (P46)

"It is not always easy to be online. Instead of Moodle, we could meet face-to-face to share feedback." (P36)

3.3. Discussion

Major findings revealed that participants believed that they reached a deeper understanding of the topic they studied by means of PBL. Based on the interview results, it is clear that this was because the participants had opportunities to solve authentic problems relevant to their interest. Participants also remarked that PBL should be a part of other courses because practical activities based on realistic problems helped them learn in different ways and, and it enabled them to relate their in-class experiences to real-life situations. In that sense, PBL has proved to be an effective instructional approach in education (Kırkgöz, 2015; 2017). PBL can be a logical instructional approach in educating teachers to be capable of putting forward diverse perspectives. By experiencing real-life problems during teacher education programs, prospective teachers become able to transfer knowledge and skills to their professional lives (Borhan, 2014).

It is obvious that PBL was helpful for research skills of EFL teacher trainees, especially for analyzing and organizing information. A similar conclusion was drawn by Stentoft (2019) who claimed that PBL might foster medical students' research skills and competencies. In addition, participants considered that they developed critical and analytical thinking skills. As a result, teacher trainees who experience such PBL practices will hopefully be one step ahead of their colleagues in terms of professional and personal development. Moreover, participants could learn from each other while working in groups, and how to resolve disagreements within the group. That is, language learning and teaching should be examined in a social basis, and group work appears to be effective in helping participants deal with social matters. However, participants indicated that they developed self-learning skills, which shows that doing academic work individually or being autonomous are among the other benefits of PBL as well as they learnt how to strengthen collaboration among them.

Participants mostly stated that there was no difficulty in PBL practices although they listed some obstacles about PBL experiences. To exemplify, working in groups, technological problems, consuming much time and receiving limited feedback created challenges in the process. Among those reported obstacles, consuming much time was found to be one of the disadvantages that may be experienced while trying to frame effective PBL problems by Ribeiro (2011) who also mentioned the necessity of intensive research in order to formulate those problems. Based on these, PBL applications cannot be asserted to be without deficiencies and may result in inefficient outcomes if the implementation is not progressed as it should be. For this reason, in PBL applications, group works should be well-designed, technological equipment should be controlled, regular and ongoing feedback should be given, and sufficient time should be set to reach maximum success.

Moodle was found to be useful by participants and they felt glad about using it. The most cited benefit of Moodle was that it was time-saving. On the contrary, there were few participants stating that Moodle was complicated and confusing. In parallel with this, So and Kim (2009) alleged that teacher trainees benefited from the technology-enhanced PBL course though they had several difficulties in applying knowledge into a technology-integrated PBL lesson. Despite some threats such as low student motivation, limited instructional time, lack of establishing collaboration, weak

questioning techniques (Pecore, 2013), PBL practices can be more fruitful with technology integration as revealed in the current study.

4. Conclusion

The objective of the study is to determine prospective teachers' opinions and evaluations about PBL through Moodle in a teacher education course. Findings suggest that PBL is useful in a number of aspects such as becoming familiar with steps of research, working in groups, developing autonomy, solving real-life problems and having deeper understanding of theory. At this point, it should be noted that PBL is not a panacea, but motivating and interesting because trainees themselves choose the topic and materials. Moreover, the sense of solving a real problem in a real language classroom may be considered as a triggering force for the trainees to be more eager to complete their PBL practices. The typical and traditional way of delivering the Materials Evaluation and Adaptation course would be to ask trainees to select an English textbook and make theoretical analysis on it in terms of the design of its content, sequence of the activities, and the language skills developed and so on. Yet, such a procedure can only enhance the theoretical knowledge without any opportunity to engage in practice in authentic environments or to receive peer support. For this reason, the preference of PBL in teacher education courses, as in the present study, may provide the trainees with the opportunity to gain more than theoretical knowledge. Namely, they can have the chance to put their theoretical knowledge into practice by solving authentic problems in collaboration with their peers under the guidance of their teacher educator. Most importantly, the fact that the trainees identify and solve the problems themselves in PBL may arouse the feeling of self-confidence by realizing that they are able to reflect all knowledge they have learnt in methodology courses upon practices in real classrooms. Another dimension of the study is the integration of Moodle into PBL, which helped participants gain awareness about new information technologies. For this reason, we recommend that a balance between conventional and technology-integrated instruction should be built. That is, face-to-face instruction and the use of online tools in teacher education courses could be equated in order to maximize one's advantages and to minimize the other's disadvantages.

As an implication, any branch of knowledge can be adjusted to PBL despite the fact that the problems may differ among disciplines. PBL can be adapted in any teacher education course with ease and this makes it practical for tutors to implement PBL at tertiary level. Therefore, PBL should be an indispensable part of teacher education programs. This is also confirmed by this study because participants believed that PBL should be a part of other courses in their department. Regarding limitations, the current study is only concerned with senior students' PBL experiences, and data were elicited solely from questionnaires and interviews. In a further study, freshman, sophomore or junior students could be involved, and different data collection tools could be utilized to triangulate the data. The greatest limitations can be attributed to technological problems. To overcome this, before such implementations, one needs to ensure that every participant possesses quality technological gadgets such as phones, tablets or laptops and Internet connection. Considering the positive impacts of this study, future research could be geared toward educating teachers on the way to teaching languages by means of PBL.

Declaration

Author contribution : The first author is in charge of resources, methodology, data curation, writing, review, editing, investigation, conceptualization, validation, supervision. The second author is in charge of formal analysis, validation, methodology, investigation, writing original draft, writing, review and editing.
Funding statement : The research is funded under no research project.
Conflict of interest : The author declares no conflict of interest.
Additional information : No additional information is available for this paper.

REFERENCES

Adnan, M. (2017). Professional development in the transition to online teaching: The voice of entrant online instructors. ReCALL, 30(1), 88-111. https://doi.org/10.1017/S0958344017000106

Alario-Hoyos, C., Gomez-Sanchez, E., Bote-Lorenzo, M. L., Asensio-Perez, J. I., Vega-Gorgojo, G., & Ruiz-Calleja, A. (2015). From face-to-face to distance LMS-mediated collaborative learning situations with GLUE! Computer Applications in Engineering Education, 23(4), 527-536. https://doi.org/10.1002/cae.21623

Avcı, S., Akıncı, T., & Bakioğlu, A. (2012). Using real life problems for developing prospective teachers' classroom management skills. Çukurova University Faculty of Education Journal, 41(2), 18-28.

Barrows, H. S. (1983). Problem-based, self-directed learning. Journal of the American Medical Association,250,3077-308. https://doi.org/10.1001/jama.1983.03340220045031

Borhan, M. T. (2014). Problem based learning (PBL) in teacher education: a review of the effect of PBL on pre-service teachers' knowledge and skills. European Journal of Educational Sciences (EJES), 76-87. https://doi.org/10.19044/ejes.v1no1a9

Buff, C. L. (2011). Learning and mission in action: Implementing problem based service learning in the consumer behavior classroom. International Journal of Business Research, 11(5), 123-130.

Chagas, I., Faria, C., Mourato, D., Pereira, G., & Santos, A. (2012). Problem based learning in an online course of health education. European Journal of Open, Distance and E-Learning, Retrieved from http://www.eurodl.org/index.php?article=505

Creswell, J. W. (2012). Educational research: Planning, conducting and evaluating quantitative and qualitative research. (4th ed.). Boston, MA: Pearson.

Edwards, S., & Hammer, M. (2006). Laura's story: Using problem based learning in early childhood and primary teacher education. Teaching and Teacher Education, 22(4), 465-477. https://doi.org/10.1016/j.tate.2005.11.010

English, M. C., & Kitsantas, A. (2013). Supporting student self-regulated learning in problem- and project-based learning. Interdisciplinary Journal of Problem-Based Learning, 7(2), 128-150. https://doi.org/10.7771/1541-5015.1339

Ferreira, M. M., & Trudel, A. R. (2012). The impact of problem-based learning (PBL) on student attitudes toward science, problem-solving skills, and sense of community in the classroom. Journal of Classroom Interaction, 47(1), 23-30.

Hung, W. (2011). Theory to reality: A few issues in implementing problem-based learning. Educational Technology Research and Development, 59(4), 529-552. https://doi.org/10.1007/s11423-011-9198-1

Jerzembek, G., & Murphy, S. (2013). A narrative review of problem-based learning with school-aged children: Implementation and outcomes. Educational Review, 65(2), 206-218. https://doi.org/10.1080/00131911.2012.659655

Kırkgöz, Y. (2015). Designing and implementing an innovative problem-based teacher education course. American Journal of Educational Science, 1(5), 229-239.

Kırkgöz, Y. (2017). Working the problem: Finding solutions to student dissatisfaction in EAP for engineering. In Stewart, T. (Eds.), Voices from the TESOL classroom: Participant inquiries in higher education classes (pp. 17-26). TESOL International Association: Alexandria, Virginia.

Kırkgöz, Y. (2018). Problem-based learning in a teacher education program: A study of learning outcomes. In Genç, Z. S. (Ed.) Updating perspectives on English language teaching and teacher education (pp 79-92). Bern: Peter Lang.

Oja, K. J. (2011). Using problem-based learning in the clinical setting to improve nursing students' critical thinking: an evidence review. Journal of Nursing Education 50(3), 145-151. https://doi.org/10.3928/01484834-20101230-10

Paschalis, G. (2017). A compound LAMS-MOODLE environment to support collaborative project-based learning: A case study with the group investigation method. Turkish Online Journal of Distance Education,18(2),134-150. https://doi.org/10.17718/tojde.306565

Pecore, J. L. (2013). Beyond beliefs: Teachers adapting problem-based learning to preexisting systems of practice. The Interdisciplinary Journal of Problem-Based Learning, 7(2), 7-33. https://doi.org/10.7771/1541-5015.1359

Ribeiro, L. R. C. (2011). The pros and cons of problem-based learning from the teachers' standpoint. Journal of University Teaching and Learning Practice, 8(1), 4.

So, H. J., & Kim, B. (2009). Learning about problem based learning: Student teachers integrating technology, pedagogy and content knowledge. Australasian Journal of Educational Technology, 25(1), 101-116. https://doi.org/10.14742/ajet.1183

Stentoft, D. (2019). Problem based projects in medical education: Extending PBL practices and broadening learning perspectives. Advances in Health Sciences Education, 24, 959-969. https://doi.org/10.1007/s10459-019-09917-1

Strobel, J., & van Barneveld, A. (2009). When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. Interdisciplinary Journal of Problem-Based Learning, 3(1), 44-58. https://doi.org/10.7771/1541-5015.1046

Tan, C. P., Van der Molen, H. T., & Schmidt, H. G. (2016). To what extent does problem-based learning contribute to students' professional identity development? Teaching and Teacher Education, 54, 54-64. https://doi.org/10.1016/j.tate.2015.11.009

Walker, A., Recker, M., Robertshaw, M. B., Osen, J., Leary, H., Ye, L. & Sellers, L. (2011). Integrating technology and problem-based learning: A mixed methods study of two teacher professional development designs. Interdisciplinary Journal of Problem-based Learning, 5(2), 70-94. https://doi.org/10.7771/1541-5015.1255

Wijnen, M., Loyens, S. M., Smeets, G., Kroeze, M. J., & Van der Molen, H. T. (2017). Students' and teachers' experiences with the implementation of problem-based learning at a university law school. Interdisciplinary Journal of Problem- Based Learning, 11(2). https://doi.org/10.7771/1541-5015.1681

Woods, D. (2012). PBL: An evaluation of the effectiveness of authentic problem-based learning (aPBL). Chemical Engineering Education, 46(2), 135-144.

Zainuddin, N., Idrus, R. M., & Jamal, A. F. M. (2016). Moodle as an ODL teaching tool: A perspective of students and academics. The Electronic Journal of e-Learning, 14(4), 282-290.