Project-Based Learning in Online Medical Classes: The Walkway to Learn the Medical English Language Efficiently

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Abstract- Since the outbreak of the COVID-19 pandemic, online education has gained more momentum. Despite its advantages, virtual learning has some drawbacks. To compensate for these shortcomings, the application of some innovative approaches has obtained more importance; one of them is Project-Based Learning (PBL). The present study aimed to investigate the effect of PBL on students' performance in a general English course. The participants were 55 Iranian freshmen medical students who registered in the General English Course at the Birjand University of Medical Sciences. They were selected based on convenience sampling. The classes were held virtually twice a week for 24 sessions during the spring semester of 2020. All the students in the class were asked to do a term project in the form of making English language videos about a medical topic. The recorded classes, observations, and semi-structured interviews with the students about the advantages of doing projects were the sources of data. The collected data were analyzed through thematic analysis and validated through member checking. The data analyses resulted in five main themes about the advantages of PBL in the areas of students' "autonomy," "engagement," "learning," "motivation," and "evaluation." PBL helped the students to be more autonomous and improved their engagement. Furthermore, it helped them learn new words about the diseases and improve their knowledge of their major. It also made the students more motivated and helped the teacher figure out how well they did during the term instead of just relying on the final exam.

Introduction

The need for applying technological advances and virtual learning during the COVID-19 pandemic has surged all over the world as all the classrooms everywhere were changed from face-to-face to online. Noticeably, this form of Emergency Remote Teaching (ERT) and learning seemed like the only solution to compensate for the gap in education due to the COVID-19 spread. Worthy of mentioning, ERT is a momentary shift in delivering teaching and learning virtually as the result of a crisis, and when the emergency condition abates, the format will return to normal (1). However, in these circumstances, online classes provided the students and teachers to master new ways of using technology for learning (2). The process of education is significantly benefited from the expansion of technology and the use of online classes, although it had some side effects on learning and teaching (3,4). Here, the stakeholders try to think of solutions to hold the online classes in more efficient ways to benefit both teachers and learners. The flexibility of access to the content anytime is of importance in online education (5). However, choosing the right teaching models is particularly challenging for teachers as they have to select ways that promote learning and encourage the students to learn far from the actual classrooms.

The use of pedagogical approaches such as Project-Based Learning (PBL) allows the learners to actively cooperate in the class and plan their learning in a real-life manner to solve problems that they face in learning (6). It also links the theories and methods that the students learn

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in class with their lives, especially in higher education (7). In an ethnographic study, Li and Wang (8) tried to explore the advantages of integrating PBL in EAP courses in China. The findings showed that the integration of PBL in EAP courses can improve students' academic English and their disciplinary identity. It can also boost students' autonomy and their interpersonal ability and team-working. However, despite its advantages, there were some challenges confronting the effective implementation of PBL in the Chinese context, including "English teachers' limited disciplinary knowledge, limited resources for conducting student-led research projects, and limited opportunities for the dissemination of the students research outcomes." In addition, PBL improves the students' motivation, content knowledge, and learning outcomes (9,10). In PBL, students have to regulate their own learning, which promotes self-regulated learning (11).

Based on Poonpon (12), PBL is both process and product-oriented. As PBL employs different skills such as problem-solving, creativity, autonomy, etc., together, the students' language competency and content knowledge are enhanced together (13). It also motivates and encourages the students to become more self-confident and independent in learning (14). Consequently, learning becomes fruitful, and the students are capable of planning and designing their learning (15,16).

Despite its importance and potential advantages, PBL has not been adequately addressed in teaching online General English courses at medical universities in Iran. Therefore, the present study aims at examining the effect of implementing PBL on students' performance in an online course.

Materials and Methods

The present study had a qualitative action-research design. To compensate for some of the shortcomings of online classes, the researcher asked students to do a term project in the form of making English language videos about a medical topic. The study was done at Birjand University of Medical Sciences (BUMS). The population of this study was the medical students at BUMS; among them, one class consisting of 55 freshmen (23 males and 32 females) medical students were selected. Based on the formulated research question in this study, the inclusion criteria were identified as the following: recruiting all medical students who registered in the General English Course at BUMS during the Spring semester of 2020. The participants were selected based on convenience sampling because this was the only class that the

researcher had to run the study. All of the students registered in a General English Language Course at BUMS, and their written consent for participation in the study was granted.

The class was held online through Adobe Connect Software for 24 sessions, twice a week during the Spring semester of 2020. At the beginning of the course, semi-structured written interviews were conducted with 55 students to investigate their perception of the effects of doing projects during the term. Then, they were asked to choose a medical topic, preferably a disease that they or one of their relatives had had before, and then search about it and design videos. The teacher-researcher was in close contact with the students in the class and, after the time of the class, answered students' questions and guided them in the process of doing the projects. After the treatment and at the end of the semester, written interviews were conducted with 55 students. In addition, oral interviews were conducted with 20 students to examine their ideas about the effect of implementing PBL on their performance. The oral interviews were also conducted in Adobe Connect Software. The duration of each interview was around ten minutes.

The recorded classes, observations, and semi-structured interviews with the students about the effects of doing projects were the sources of data. The collected data were analyzed through thematic analysis. To check the validity of the data, first, the transcribed data were analyzed by the author and two outside researchers. Then, emerging themes were discussed, and the final themes were agreed upon. The inter-coder reliability was estimated as 0.87. Finally, the extracted themes were returned to the interviewees for validation.

Results

Generally, the data analyses resulted in five main themes about the advantages of PBL in the areas of students' "autonomy," "engagement," "learning," "motivation," and "evaluation." Each theme is explained in more detail in this section.

Autonomy

One of the main advantages of implementing PBL was its contribution to the students' autonomy. Nowadays, with a plethora of online resources, students can learn the English language by themselves if they know how to learn it. To do the projects successfully, the students needed to search for the related materials online, read or listen to them, and find the meanings of the words that they did not know. The instructor also helped the

students in the class to find the relevant websites and materials, so they could do their projects independently. They worked on their projects outside of the class as well. They could even continue using the online sources after their final exam. Knowing about the online sources and the way that they can be used for language learning was advantageous for the students as the famous proverb says, "If you give a man a fish, you feed him for a day. If you teach a man to fish, you feed him for a lifetime."

In this regard, one student said, "I did not know anything about PBL at the start of this semester. But when you explained different aspects of PBL and how a project can be conducted successfully, I needed to refer to some online resources to find relevant information. So, I needed to study, understand, and summarize the materials so they could be suitable for my project. During this process, I asked you and my friends for help as I did not have much knowledge about the English language and the available online sources. So, I think now I know how to find relevant information and work on my language outside of class. With the help of you and my classmates, I know many websites, applications, and materials that can be used independently". Another student maintained that "although doing projects was difficult, it made us autonomous learners because we did the project independently by using the online resources. Now, I can continue learning the language by using the online sources to improve my proficiency".

Engagement

One of the main drawbacks of online education is the paucity of students' engagement in-class activities. This problem can be even worse in General English courses considering the large class size. In this course, 55 students registered, and it was very difficult for the instructor to engage all students in the class activities. Students' distraction in online classes by other social media platforms, their reluctance to turn on their webcams, and the poor internet connectivity in some areas could also exacerbate this issue. Doing projects could compensate partially for this problem as students were engaged in doing the projects. They needed to report the progress of their projects and ask their questions. Therefore, implementing PBL could not only engage students in the classroom activities but also help them to be involved in the procedure outside of the classroom.

One student said, "in our course, as you know, students have different language proficiency levels as there was no placement test for enrolling in the course. So, when the instructor asked a question, usually, students having more advanced language proficiency raised their

hands and talked or wrote in the chat box, but other students were almost silent. However, for doing the projects, we needed to work on them outside the class and also talk about their development inside the class and ask our questions. So, we were active in the class". Another student said that "for doing our projects, we needed to be active both inside and outside of the class."

Learning

In this study, the students were asked to choose a topic about medical sciences, preferably about a disease that they or one of their relatives had. As the projects were in the English language, in order to do them, the students needed to study intensively about the topic, listen to authentic audio-visual materials and then paraphrase and summarize them. This process helped students to learn not only many medical-related words and collocations but also helped them to develop their knowledge of their own field of study.

One student said, "I am really interested in the medical sciences, but so far, we did not have the chance to go to a hospital. However, by watching authentic videos, I could obtain some information about the hospital, doctor-patient conversations, etc. I think I did not learn just new English words and collocations, but I also learned much information about my major". Another student observed that "to gather information about my project, I watched many online videos that help me know more about the disease as well as the language."

Motivation

Another advantageous point of using PBL that the students referred to were the fact that it improved their motivation for learning. Since the projects were about students' majors, they could relate to the topic and pursue it more carefully. They could both learn the language and add to their knowledge of medical sciences. In addition, the instructor's and classmates' comments and feedback encouraged them to work more.

As one of the students said, "By doing a project about diabetes, I could learn many new English language words, and also I could improve my knowledge about this disease. As one of my relatives has diabetes, I always wanted to know more about this disease. Doing this project provided an opportunity for me to expand my knowledge about this disease by referring to some English language lectures and articles. Now I can share what I learned from this project with others". Another student said, "In the process of collecting information for the project, I understood the importance of knowing the English language. Because our projects needed to be in

the English language, I could find many authentic materials about my topic. I figured out that if I want to be up-to-date with the latest development in my field, I need to know the English language, which is the international language of sciences and technology".

Evaluation

One of the main shortcomings of online classes is students' testing and evaluation. The fact that students' cheating is much easier in virtual classes can make the results of the evaluation unfair. Therefore, many teachers try to refer to multiple sources of evaluation instead of a one-shot test at the end of the term. One of the methods that can be done to assess students during the term is by asking them to do a project. As the projects are evaluated regularly in the class and at the end of the semester, they can be trusted as the original task done by the students, and part of the final score be assigned to the project. Using different methods for students' evaluation can add to the validity of evaluation as well.

The students concur with the idea that using projects as one source for students' evaluation can add to the fairness of the evaluation. One student said, "apart from the fact that we learned many things from the projects, the fact that you assigned some scores for the project that were counted in our final evaluation was a very good decision. I think what we did during the term in a long period of time and was checked several times in the class can be a reliable source for evaluation". Another student believed that "online assessment is not very reliable. Sometimes we may have a poor internet connection. Also, to prevent cheating, usually, the time of the test is very limited, so we may not be able to have a good performance. So referring to other sources can result in a fairer evaluation".

Discussion

This study aimed to investigate the effect of implementing PBL on medical students' performance in the General English course. The findings indicated that doing projects can be advantageous in five main areas. It helped the students to be more autonomous in their learning and improved their engagement in classroom activities both inside and outside of the class. Furthermore, it helped them learn new words about the diseases and improve their knowledge of their major as they worked on topics related to medical sciences. It also improved the students' motivation for learning and increased the validity and fairness of students' evaluations. Besides, it helped the instructor to figure out

how well they did during the term instead of just relying on the final exam.

The findings of this study are in line with the previous studies conducted in different contexts providing support for the beneficial effects of using PBL (8-16). For example, in China, Li and Wang (8) found that the integration of PBL in English for academic purposes courses can improve students' learning, autonomy, and team-working.

The limitations of online classes in the areas of teacherstudent interactions, large class size, especially in General English courses at the Iranian universities, and the problems in students' evaluations can even add to the importance of implementing PBL to compensate for some of these drawbacks.

However, teachers may face some challenges in implementing PBL in online classes. One problem is the students' perspective on the General English language course. Some students in the Iranian context do not consider this course as an important course compared with other specialized courses that they have. Therefore, it seemed challenging at the beginning to convince the students to do a term project for this course. In addition, the heterogeneity of students' language proficiency levels and limited time of instruction can cause further challenges for implementing PBL in online classes in the Iranian context.

The study had some limitations. Firstly, the participants were not selected randomly, so the findings cannot be generalized to other contexts. In addition, in some sessions, a few students had a poor internet connection, and therefore they needed to listen to the recorded files of the class sessions.

Considering the advantages of PBL, it is suggested that other researchers incorporate this approach into their teaching in other contexts or in teaching other courses and share their findings. Examining the effects of students' gender and other personal characteristics on their perception of PBL could be another area for further research.

Acknowledgments

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