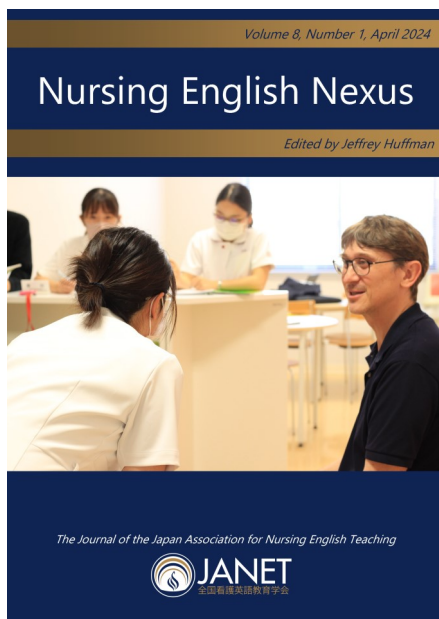


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## Problem-Based Learning Presentations with Healthcare Students: Opportunities and Challenges

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**Abstract:** *Problem-based learning (PBL) is "a teaching style that pushes students to become the drivers of their learning education" and "uses complex, real-world issues as the classroom's subject matter" (The Hun School of Princeton, 2020). PBL is not new in medical and healthcare education. According to Tadesse et al. (2022), PBL was first introduced at medical schools in Canada in the late 1960s. PBL for medical and healthcare students often refers to well-constructed problem-solving tasks based on real-life cases in hospitals. Ramadhani et al. (2019) argue that "PBL can improve critical thinking skills, foster student initiative, internal motivation to learn and can develop interpersonal relationships in group learning" (p. 217). On the other hand, Othman and Shah (2013) contend that the implementation of PBL in language education is "going at a snail-pace" (p. 125) because language learning is not considered a content subject. This report describes a PBL presentation project implemented with healthcare students.*

**Keywords:** problem-based learning, presentations, healthcare students, machine translation, eye contact

**About the Author:** Tomoyuki Kawashima is an associate professor at the Graduate School of Health Sciences, Gunma University. He taught English to high school students for 25 years. His research interests include pedagogical applications of World Englishes in English language teaching, affective factors in speaking English, and developing speaking and writing skills.

### Instructions

The PBL described in this paper was different from the conventional PBL for medical students. It was a series of group work tasks starting with discussions to identify a health-related issue, analyze the causes of the problem and the current measures, and propose alternative solutions. In the end, students made group presentations to share the outcomes of the group discussions with the entire class. This sequence of collaborative work is referred to as the PBL presentation in this paper. The activity had two objectives: To deepen students' understanding of medical and healthcare problems and suggest solutions by working together, and to develop language skills and attitudes to use English confidently.

The PBL presentation was done by 117 second-year college students majoring in nursing, laboratory sciences, physical therapy, and occupational therapy as part of a compulsory English course. After completing this course, students were expected to have mastered basic expressions in medicine and healthcare and to

have deepened their understanding of medical and healthcare problems and suggest solutions. The PBL presentation was done to achieve the course's second aim. Students were in three classes, and I met them once a week over 15 weeks. The PBL project continued for eleven weeks, and presentations were performed in weeks 10 and 11. One-third of the course hours, an equivalent of five 90-minute classes, were used for this activity.

Twenty minutes were spent on weekly group discussions for the first nine weeks. In the first week, students were divided into ten groups of three or four and had an orientation. Then, they were instructed to identify a health-related issue in Japan and propose new solutions. Each student was assigned one of the following four parts and was told to prepare the manuscript and slides for the part:

Part 1: Introduction of the problem (what is the problem, and why is it a serious problem?)

Part 2: Causes of the problem (why does

the problem occur?)

Part 3: Measures that have been taken so far and their shortcomings

Part 4: Proposals for new approaches to address the limitations

Moreover, to encourage students to look at the audience while presenting in class, the length of the script for each part was set to be 100 words, and the number of slides for each part was limited to two.

There were four kinds of take-home assignments. The script and slides were assigned as group tasks, and one student from each group completed and submitted the group’s manuscript and slides through Moodle. The remaining two tasks, which involved writing questions and keeping a record of oral reading practice (described below), required students to work individually. When the manuscripts of the ten groups were submitted, they were compiled into a single PDF file which was uploaded on Moodle. Students read the manuscripts of the other groups and created nine questions. For example, a student in charge of Part 2 in Group 5 made questions for Part 2 of all groups except for Group 5. The questions were collected via Google Forms. Later, I read all of the questions and selected three questions to be asked in class for each part of each group. The questions for each part were printed on a piece of paper and, at the start of class, handed to the students who made the questions (Figure 1). Therefore, students who gave presentations were unaware of the questions that would be asked after their presentation.

**Figure 1**  
*Example of a student’s questions to other groups*

Name	Group	Part	Question to Group 6	Question to Group 8
****	Group 2	Part 3	Q1 What is the implementation rate of online treatment by the elderly	Q2 Are robots also used to communicate with patients?

The fourth assignment was to practice reading the manuscript. Each student read his or her part of the script aloud at least five times and submitted a record of their practice. For proof of practice, Google’s voice typing tool was used. Students opened a new document in their Google Drive and selected “voice typing” from the Tool Bar. They started reading their script aloud after changing the language from Japanese to English. Then, students compared what was transcribed by the AI with the original script and highlighted the discrepancies in color. Finally, they downloaded the Google document as a PDF file and submitted it via Moodle (Figure 2).

**Figure 2**  
*Example of an AI transcription of a student reading a script*

五回目(5<sup>th</sup> Trial)  
 Not ghosts we explain the way for the loss of care worker. First have you ever heard about the number of carrots now there are two point one 1 million carats in Japan in the future we need two points 8 million can record after 20 years it's what terrible problem so we have to try to improve the present situation second we have a basic balloon so learn about can't work this plant is to accept our negative feelings about our work always so it's a chance to know about the way to take care of someone at the plan for instance we know about the safe and easy way to move someone's body and also we know about the streets event next year but we still have the problem about care work so we have to try to solve that problem but can't work

Regarding grading, 35 points of the 100-point semester grade were allotted to the PBL presentation. The evaluation was further divided into take-home assignments and the final presentation. The presentation script and slides (5 points), the preparation of questions (5 points), and the oral reading practice record (10 points) made up 20 points of the assignment. In addition, 15 points were allocated to the presentation, which included eye contact (5 points), speed (5 points), pronunciation (3 points), and responses to questions (2 points). Only a small number of

points were assigned to question responses because it was unclear to what extent students could answer questions spontaneously.

The following was the evaluation process. I stood at the back of the classroom and monitored how long students looked at the audience during their presentations. Those who continued to read the script or look at the screen were penalized for lack of eye contact. For speed, I judged whether the delivery was at a comfortable pace for the audience with appropriate pauses. Students who read manuscripts tended to speak too fast. The evaluation of pronunciation was based on the intelligibility of speech. Finally, the number of questions appropriately answered was used to determine the grade for the response to questions. Following the presentation, each student answered two or three questions from the floor, depending on the time available.

At the end of the semester, a questionnaire designed to elicit feedback on the activity (see Appendix) was given online through Moodle. I informed the students that their questionnaire data would be anonymized and used for research purposes, and gained their consent to do so.

### Opportunities and Challenges for Teachers

The PBL presentation sought to enhance student awareness of health-related issues by allowing students to research causes, analyze current measures, and present alternative solutions. Of the 117 students, 103 students answered the post-instruction questionnaire, with the response rate being 88.0%. Over 90% stated that they gained "a great deal" (26.2%) or "a certain amount" (63.1%) of insight into medical and health problems and were able to present their answers. This shows that the first learning goal of gaining a greater understanding of medical and healthcare problems and proposing solutions was achieved.

Student growth in terms of English language learning, which was the second learning objective, was also noted. I taught two-thirds of the

students ( $n = 81$ ) over two semesters, and they experienced the PBL presentation in both semesters. What was particularly impressive was their progress in responding to questions after their presentations. Though the maximum possible score was 2 points, a paired-sample t-test revealed that the grades improved significantly from the first semester ( $M = 1.44$ ,  $SD = .49$ ) to the second semester ( $M = 1.68$ ,  $SD = .51$ ,  $t(80) = -3.818$ ,  $p < .001$ ). It presented a medium-sized effect ( $r = .39$ ). The higher evaluation in the second semester demonstrates that students were better prepared for possible questions, and that they managed the situation better in the second semester.

Despite these favorable results, I identified three areas that warrant further intervention to optimize the effects of the instruction: the selection of a problem, the preparation of the presentation script, and eye contact during presentations. As for the first limitation of selecting a problem, when I first conducted the PBL presentation, I did not confine the health-related issues to Japan. As a result, seven groups out of 30 selected problems that were too difficult to permit student participation in the problem-solving process, such as hunger in Ethiopia or the global healthcare gap. This lack of engagement led to shallow discussions concluding that additional donations would solve the problem. What is critical for the PBL presentation, in my opinion, is whether the presentation gives the audience a concrete sense of the feasibility of new solutions and, as a consequence, a shared sense of the prospect of solving an existing problem. Based on that experience, when I instructed the PBL presentation for the second time, I limited health-related problems to ones occurring in Japan and told students to choose a problem relevant to college students.

The second challenge was the preparation of presentation scripts using machine translation. According to the post-instruction survey (Q4),

40.8% of the 103 respondents stated that they used automated translation to prepare their scripts. Unfortunately, machine translation may outperform student abilities, and the software often creates more complicated sentences than students could come up with on their own. As a result, the use of machine translation can have a negative impact on student presentations. I observed that some students were unable to use the machine translation results selectively, and they became completely dependent on the AI tool. These students ended up reading their scripts blindly, with little consideration for maintaining eye contact with the audience. Machine translation is already available to students, whether teachers allow it or not. Therefore, teachers must exercise greater care to ensure that its usage does not hamper the long-term development of students' language abilities.

Jolley and Mimone (2022) provide a useful summary of research on this topic over the last 30 years. Though they do not propose particular pedagogical approaches to reduce teachers' dilemmas, they help teachers understand how students use machine translation (MT) tools, how teachers and students think about MT, how MT use may influence language acquisition, and how teachers should respond to student MT use. Moreover, Noguchi (2023) describes a presentation task that allows students to prepare presentation manuscripts in Japanese and then produce both their own and MT translations, in order for students to learn how to use MT effectively and with greater understanding. Considering the steady progress of MT and teachers' and students' reactions documented in these publications, it seems more appropriate for teachers today to guide students on how to use MT effectively and ethically rather than to prohibit them from using it.

The third challenge was eye contact during presentations, an issue not confined to PBL presentations. Despite my constant reminders, I

found that keeping students' eyes off their scripts during presentations was difficult. The current instruction limited the script's length to 100 words and the number of slides to two for each student. In addition, script reading practice was added as a take-home assignment. However, other functions, such as the PowerPoint presenter view option, tempted students to read the script. Teachers may have different opinions on how much eye contact students should make during presentations. One thing is certain, however, that without the teacher's firm guidance, more and more students misinterpret that a presentation is about making a draft, using machine translation, and simply reading it.

Increased practice is one technique for reducing student reliance on the script. Shimo (2011) introduced the "simultaneous presentations" method, in which students practice presentations repeatedly with different partners. One student makes a presentation, and the other listens to it. The listening student then gives feedback to the presenter, and they switch roles. Following that, one student switches seats while the other remains in the same seat. Simultaneous presentations can also be held in small groups.

### Conclusion

The aim of this article was to share with the teaching community the opportunities and challenges of a PBL-based instruction sequence consisting of collaborative learning and presentation. It was designed to raise awareness of health-related issues and inspire students to see themselves as key problem-solving agents. Furthermore, preparing and reading English presentation scripts can help students enhance their English skills and readiness to answer questions. However, there are some pitfalls that teachers need to consider to maximize the impact of their instruction. I hope my experience and the pedagogical tips reported here may help teachers who attempt similar activities with healthcare students.

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## Appendix

### Questionnaire (Original Japanese)

Q1. 協働を通して医療や健康に関する問題について考察を深め、解決法を発信できるようになりましたか。次の選択肢から1つ選んでください。

1. 大いに医療や健康に関する問題について考察を深め、解決法を発信できるようになった。
2. ある程度医療や健康に関する問題について考察を深め、解決法を発信できるようになった。
3. あまり医療や健康に関する問題について考察したり、解決法を発信することができなかった。
4. 全く医療や健康に関する問題について考察したり、解決法を発信することができなかった。

Q2. 課題を決める時に、一番重視したことは何ですか。

Q3. 最終的に選んだ課題は何でしたか。

Q4. あなたは原稿作成のために、自動翻訳を利用しましたか。

1. はい
2. いいえ

### Questionnaire (Japanese translation)

Q1. Through this collaboration, were you able to consider medical and health issues more deeply and present solutions?

Select one of the following choices.

1. I gained a great deal of insight into medical and health issues and was able to present solutions.
2. I gained a certain amount of insight and was able to present solutions.
3. I was not able to give much thought to or present solutions to medical and health issues.
4. I was not at all able to deepen my consideration or present solutions to medical and health issues.

Q2. What was the most important thing when you chose an issue?

Q3. What was the issue you finally chose?

Q4. Did you use automated translation to prepare your script?

1. Yes.
2. No.