

Beyond Writing Skills

Lessons from a Collaborative Project-Based Learning Course

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課題解決に必要なライティングスキルとは ——課題解決型学習を通しての外国語教育より——

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Abstract: The swift evolution of technology, propelled by generative AI, has heightened concerns about job displacement. The World Economic Forum Forecast emphasizes skills such as learning strategies, collaboration, and creativity as pivotal for 2030 and beyond. Notably, engineers are expected to hone communication, intercultural competence, collaboration, problem-solving, and technical skills. To cultivate these competencies, many in higher education integrate Project-Based Learning (PBL), enabling students to apply theoretical knowledge practically. The initial study delved into the impact of integrating PBL within foreign-language learning, aiming to identify essential collaborative project skills. Here, Design Thinking was applied to effective teaching methods for curriculum integration. The core focus centers on a collaborative PBL course conducted in the 2023 academic year within a language-learning environment. This paper reports students' perceptions regarding the necessary skills for future competitiveness. Insights from the 2023 collaborative PBL course underscored the paramount importance of enhanced writing and integrative thinking skills. Specifically, students recognized the need for deeper comprehension and analytical abilities, rather than simply language skills needed for translation, to address unique situations effectively in the future

Keywords: writing skills, Project-Based Learning (PBL), Design Thinking

1. Introduction

Due to generative AI, the evolution of current technology is far more rapid than the evolution of traditional technology. Even before the pandemic, it was said that many jobs will be eliminated in the future due to the spread of AI, and it is now believed that this trend will continue. Jobs that are difficult to replace include those that require communication, such as medicine, education, and counseling, as well as those that require creativity, such as design, engineering, and management (Arnts et al., 2016). The report for the future skills in 2030 includes learning strategies, collaboration, creativity, and communication (Bakhshi et al., 2017). These overlap with the future of jobs report from the World Economic Forum (2023). For engineers, these comprise five categories: (1) communication skills, (2) intercultural competence, (3) collaboration skills which transcend narrow specialties, (4) problem-solving skills, and (5) technology skills (Donnelly & Fitzmaurice, 2005; Riemer, 2007; Samavedha & Gagupathi, 2008).

In order to acquire these skills, Project-Based Learning (PBL), in which students can apply knowledge from the classroom to practical situations, is implemented in higher education. PBL creates opportunities for students of various specialties to experience the process of identifying and solving problems collaboratively across disciplines. It is often used in engineering education as a framework for activities inside and outside of the classroom (Donnelly & Fitzmaurice, 2005). A previous study indicated that students in a PBL context exhibited more self-directed learning (Hung 2011), became more involved in the problem-solving process, and worked more as a team, which can increase students' motivation and problem-solving skills (Beckett, 2002; Roschelle & Teasley, 1995). In the Japanese education setting, PBL courses create an opportunity to apply subject-specific knowledge to practical situations (Aoki et al., 2009; Inoue & Kaneda, 2008; Kumeno et al., 2016). The aforementioned cases are mostly used in subject-specific settings, and they are still not commonly implemented in a foreign-language setting.

This study examines the effects of incorporating problem-solving projects into foreign-language learning for the acquisition of the skills mentioned above and identifies the skills that participants need in order to effectively carry out collaborative project activities. The study seeks effective teaching and evaluation methods for assessment in order to incorporate them into the curriculum. In this paper, the author will provide an overview of the collaborative PBL course in a language-course environment and report how it was conducted in the 2023 academic year, paying special attention to student perception of the problem-solving activities and the skillset deemed necessary to be competitive in the future.

2. Collaborative PBL Course Overview

2.1 Background

This course originally started as an extracurricular activity at the Kanazawa Institute of Technology (KIT) in 2013. The students engaged with local residents directly and responded to

issues discovered at the community level. The students designed and conducted resident interviews to find out non-Japanese residents' problems rather than relying on requests from the municipality. This means students utilized a bottom-up approach to solve these issues in order to improve the day-to-day life of foreign residents (Fujii et al., 2018).

Building on the experiences with this PLB extracurricular activity, KIT incorporated this PBL project into the English language curriculum from the 2017 academic year. Because the English Language Program is part of the Academic Foundations Programs, all students are required to take eight credits worth of English courses. A placement test is administered at the beginning of their freshman year, and students are divided into three groups according to their proficiency level. Table 1 illustrates the English courses, and A-C indicate the levels that students are placed into, with "C" being highest. Students are recommended to take the sequence of courses in their level, but they can choose any course from their second semester. Most students complete the English requirement by the end of their second year. The PBL course was implemented in the English Seminar class, since these courses comprise the highest level.

Table 1 *Language Program at Kanazawa Institute of Technology*

	1 st year Spring	1 st year Fall	2 nd year Spring	2 nd year Fall
A	English Topics 1	English Topics 2	English Topics 3	English Topics 4
B	English Topics 3	English Topics 4	English Topics 5	Business Communication 1
C	English Topics 5	Business Communication 1 Academic Reading 1 Writing Basics STEM English	Business Communication 2 Academic Reading 2 Academic Presentation English Seminar	Academic Reading 1 Writing Basics STEM English

2.2 Collaborative PBL course

In 2020, the intention was to have the course participants collaborate with international students in the Japanese Language Program (JLP). However, due to the pandemic, the JLP was cancelled, and in 2022 it was conducted online. In 2023, this collaborative PBL course was finally conducted in person.

For KIT students, the course met once a week (100 min./class) for 15 weeks in the Spring semester starting in April. The objectives of this course were to develop the skills for discovering problems in the local non-Japanese community and solve these problems, all while using English. Thirty-four students were registered into three classes (Class 1, 17 students; Class 2, 7 students; Class 3, 10 students) with one instructor per class.

The JLP is a six-week program consisting of Japanese language and culture courses. Twenty-nine participants from universities in the U.S. and the U.K. that have exchange agreements with KIT registered for the program. The culture courses consisted of a community project course and a

Japanese cultural experience course. The community project course is the collaborative PBL course (Table 2) under discussion. Because the summer intensive course started in June, JLP students joined this course from Week 9 (Table 3). They were divided into the above three KIT classes; 18 students from Japanese Communication 1 teamed up with 17 students from Class 1; five students from Japanese Communication 2 teamed up with seven Class 2 students; six students from Japanese Communication 3 teamed up with ten Class 3 students.

Table 2 Japanese Language Program Courses

Courses	Subject Name		Outline
Japanese Language	Japanese Communication 1 (Novice Level)		This course is an introductory course to help students develop all four basic skills of communication (speaking, listening, reading, and writing) in modern Japanese.
	Japanese Communication 2 (Novice-high to intermediate level)		This course aims to reinforce basic grammar through communication tasks and help students further develop the four basic skills.
	Japanese Communication 3 (Intermediate-high to advanced level)		This course aims to help students build on their previous knowledge and continue to broaden their knowledge of intermediate-high level grammar, vocabulary, and idioms as well as socio-cultural aspects of Japanese.
Japanese Culture	Japanese Seminar	*Japan Community Project	This is a collaborative Project Based Learning (PBL) course that aims to develop the skills to identify problems in the local community and to offer solutions. Students work in groups with KIT students.
		Essentially Japan	This course consists of 1) acquiring knowledge and 2) seeing that knowledge in action through field work. First, students learn about specific topics related to Ishikawa or Japan, such as working in Japan, Japanese society, religion, and architecture. Students visit relevant places to deepen the knowledge acquired in the classroom.

2.3 Integrating Design Thinking into the PBL course

The collaborative PBL course was based on the application of the Design Thinking approach (Brown, 2008). Design Thinking began with research on the application of designers' thinking to engineering and other fields. It has since been applied as a method to discover and solve various everyday problems based on an understanding of users and to propose concrete solutions from a creative viewpoint (Brown, 2008; Guaman-Quintanilla et al. 2018; Luka, 2020). Design Thinking is characterized by members from various fields working together on issues, empathizing with users and customers through research and interviews, integrating their own ideas with team members, and collaborating to propose creative solutions, which is reported to lead to the acquisition of the

communication skills and creativity described above (Balakrishnan, 2021; Khalaf et al., 2012; Linton & Klinton 2019; Matsushita et al., 2015).

The Design Thinking process is built on the following process: “Empathy,” “Define,” “Ideate,” “Prototype,” and “Test.” Table 3 illustrates the collaborative PBL course structure and activities in this study. In Week 1, the class had a hands-on activity to introduce the Design Thinking process. The lectures were given in English, and students were assigned homework assignments, such as watching videos in English before class, that introduced each Design Thinking process for the following week.

In the Empathy phase, students decided on their city of focus, as there are a few cities in the area where KIT is located. Groups were created based on their geographic focus, and students worked to narrow down their target demographic, such as foreign tourists, exchange students, or non-Japanese residents who work in the target cities. Students drafted questions in English and practiced interviewing as an in-class activity. Then, students went to observe their target demographic and conducted interviews in person or via Zoom in order to empathize with their subjects and identify their problems.

After collecting the information in the Empathy phase, students categorized the data using an “Empathy Map” to gain insight about their subjects’ activities and emotions (Saso, 2015). Students also researched more about what they learned from their interviews and visited related facilities, such as the various city halls or tourist-information desks. Building on this information, students created a persona. This is a method of visualizing imaginary residents based on the characteristics of the target from information obtained through interviews and observation (Saso, 2015). In the Define phase, students analysed all data and listed the issues the target demographic faced to define the real problem.

At this point, JLP students joined the class, and KIT students shared their information and presented their progress. In addition to the class time, the class had icebreaker activities in Week 9. In the Ideation phase, both KIT and JLP students collaborated to come up with solutions. They discussed the best ways to solve the uncovered problems and worked together on prototypes. In the Prototype process, quick prototypes are created and improved into a form that can actually be used. Unlike corporate prototyping, in this process many prototypes were created at an earlier stage after the idea was conceived, without spending money. This allowed the process of refining and improving ideas over and over again while receiving direct feedback from the target demographic and the municipalities and created an environment in which the idea was co-created with them. Finally, the Test phase allowed the process of refinement and improvement of ideas to be repeated many times, while receiving direct feedback, before arriving at the finished solution.

Table 3 *The collaborative PBL course structure and activities.*

	Design Thinking Process	Activities
Week 1	Orientation Design Thinking Workshop	Learning the basics of Design Thinking in a workshop
Weeks 2-6	Empathy	Project planning Observing in the field and conducting interviews
Week 7-8	Define	Organizing and analysing data Defining real problems
Week 9 (Week 1) *	Mid-term presentation	Reporting progress
	(Design Thinking Workshop) Icebreaker activity	(Learning the basics of Design Thinking) EFL and JLP students meet their group members Reporting their progress to the group members
Week 10-11 (Week 2-3) *	Ideation	Brainstorming and finding solutions
Weeks 12-13 (Weeks 4-5) *	Prototyping and testing	Creating prototypes Testing prototypes, getting feedback, and revising prototypes
Week 14 (6) *	Final presentation	Presenting results
Week 15	Reflection	Submitting the final product

*Weeks in parentheses indicate the JFL course.

3. Report from the course

The collaborative PBL course consisted of three classes. JLP students were divided into three classes and teamed up with KIT students to create 12 groups total (Class 1, six groups; Class 2, two groups; Class 3, four groups). The following report will focus on one of the groups in Class 1. Class 1 was the largest of the three classes, with six groups. Five groups targeted foreign tourists, due to KIT's proximity to a famous tourist area, and one group targeted residents who live in the city where KIT is located. The chosen group was the only one that focused on residents. The group consisted of five students; two KIT students and three JLP students, among whom two were from the US and one was from the UK.

The present study used a wide range of materials to identify skills for collaborative projects, including sets of assignments, presentations, final products, self-reflections, and observation by the instructors.

3.1 Language skills needed for problem solving

One approach to identify skills needed for collaborative projects was the use of self-reflections. The reflection sheet was divided into three sections: language, culture, and others. Each section had things participants learned and necessary skills as perceived by the students themselves. Both KIT

and JLP students completed the reflection sheet at the end of the course.

In terms of language skills, KIT students mentioned they learned conversation skills and felt speaking and listening skills were important throughout the course. This course was an English-language course for KIT students and was conducted in English. For JLP students, this course was part of the culture course, so they were not required to use Japanese for group work. When JLP students joined their group, KIT students needed to communicate with them in English. Also, JLP students had not yet joined the course during the first phase, so KIT students needed to conduct interviews with the residents on their own, without the assistance of native English speakers. The goal was for students to improve their empathy and cross-cultural understanding by having them experience the process of discovering the residents' issues. Brown (2008) listed "empathy" as one of the crucial elements in a successful Design Thinking process because this phase determines the direction of a project. Empathy is cognitively knowing another person's thoughts or sharing another person's feelings while maintaining the distinction between self and others (Umeda, 2014). To identify issues that the target demographic is facing, empathizing with people and learning from their insights is vital. Although KIT students understood this, they felt it was difficult to achieve with their English-proficiency level. On the other hand, JLP students who joined from the Ideation phase indicated that it was reading and writing skills that were necessary to solve the problem they worked on.

KIT students discovered a few problems faced by residents, such as transportation and language issues, through the interview process. The collaborative group decided to focus on language-related problems, especially an important resident registry document that must be filed when people move to the city, *jumin idotodoke*. Students started on the translated version of the form. Between KIT and JLP students, they faced many difficulties in translating the form, quickly realizing that a simply translating the document wouldn't work.

The document was a piece of paper with many sections. It was hard to understand which sections to fill out and which sections were for administrative use. The group applied "design ethnography" (Stickdorn & Schneider 2012) to deepen their understanding of the situation in question by visiting city hall and learning how city hall employees communicated with foreign residents. The group's final product was a manual for foreign resident with instructions on how to fill out this document. It included translations and explanations, as well as a Western and Japanese calendar comparison chart for filling out the birthday section with the appropriate year.

In this case, writing skills were not simply translating from Japanese into English. Students needed to apply "integrative thinking" skills and "not only rely on analytical process but also exhibit the ability to see all of the salient – and sometimes contradictory – aspects of a confounding problem and create novel solutions that go beyond and dramatically improve on existing alternatives (Brown 2008)." It was apparent from the student's reflections that, while they felt writing skills were important, they were not sufficient for problem-solving. To arrive at a suitable

solution, students needed to explore and interrogate the problem more deeply than the initial straightforward attempt. While this is something that could be explained in class, because every situation has a unique set of challenges, the author believes it is only through practical application, such as the PBL approach, that students can understand this experientially.

4. Pedagogical Implications

This project yielded a number of challenges as well as pedagogical implications which will be outlined here. The groups successfully designed their products. Through this course, they not only improved their language skills, but they also experienced an actual collaborative problem-solving process.

KIT students mentioned that they felt encouraged to use English throughout the course. One commented that they were surprised at how actively JLP students communicated with them, and this entire experience motivated them further to learn English. They also became more aware of issues faced by non-Japanese people in their daily lives in Japan.

The Design Thinking process highlights that writing skills in a multilingual context extend beyond mere translation. Students were tasked with creating a comprehensive manual, emphasizing the importance of contextual understanding, cultural nuances, and precise language use. The process underscores that effective writing is intertwined with integrative thinking. It is not just about linguistic accuracy, but also about synthesizing information, considering multiple perspectives, and creating innovative solutions to complex problems.

While writing is a fundamental skill, the activity suggests its limitations in isolation. Merely translating or writing without integrating critical thinking may not address the depth and complexity of real-world challenges. Students recognized that writing skills, though crucial, were not the sole determinants of successful problem solving. The collaborative PBL course emphasizes that effective writing often necessitates a deeper understanding and exploration of the subject matter. It's not about surface-level descriptions, but about probing, questioning, and delving into intricacies to provide comprehensive and effective content. While classroom instruction provides foundational knowledge, the true essence of mastering complex writing tasks is grasped through practical, experiential methods like the collaborative PBL course. Such hands-on experiences allow students to confront real-world challenges, reinforcing the importance of robust writing skills coupled with critical thinking. The course accentuates that in today's diverse and complex contexts, writing skills demand more than linguistic proficiency. They require depth, integrative thinking, and practical application to address multifaceted challenges effectively.

Beyond language skills, one KIT student also commented that it "was very meaningful to learn about Design Thinking and it was very stimulating to learn about this, as it diversifies the way we look at things." This comment highlights the impact of the Design Thinking approach. One JLP student also noted: "I thought the project was very cool and allowed us to examine problems

and solutions in a fun way. I'm glad I got to interact with the Japanese students, because it made for a new and interesting experience." Students also reflected on the satisfaction of having real-world effects: "The project was very interactive, which was nice. It was also nice knowing that our work could genuinely help others." However, one JLP student commented that some international members did more than others. This student felt particular students had more work than other members did, underscoring this perennial challenge of group work. For KIT students, their groups were decided according to their chosen cities of focus. However, for JLP students who joined this course in Week 9, the instructor assigned groups randomly. Also, at the time when all groups worked on their own tasks, it was challenging to monitor and facilitate the entire class. These points need to be improved upon from the standpoint of the instructor.

Evaluations used integrated performance assessments via presentations and assignments for the KIT students because this was, technically, a language course. On the other hand, for JLP students this course was part of their culture course, so the assessment materials were different and are still being developed at this time. This situation is not ideal, and the assessment protocols will require further modification in concert with the evolution of this curriculum.

Lastly, there is the issue of timing. Because the JLP program usually starts in June, when students from the US and UK have summer vacation, they end up joining in the middle of the Design Thinking process. Different school calendars across countries make it difficult to stick to the same schedule, but it would be ideal if both cohorts can all work together from the beginning of the process.

5. Conclusion

This paper provided an overview of the collaborative PBL course in a language-course setting. Through the collaborative PBL course conducted in academic year 2023, the student group highlighted in this study felt they needed listening skills to empathize with and gain insights from their target demographic. Also, international students included reading and writing skills with integrative thinking. Their final product indicated writing skills had to go beyond translating skills and needed to be based on deeper understanding and analyzing the unique situation in order to arrive at a solution. These are student perceptions of skillsets through the collaborative PBL that are considered necessary to be competitive in the future.

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