

Project-Based Learning and E-Portfolios for Preservice Teachers in Japanese Language Education

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Abstract

This study involved classroom action research that aimed to 1) develop the learning management competency for preservice teachers using the project-based learning approach and e-portfolios and 2) study the reflection of those preservice teachers in terms of learning management using the project-based learning approach and e-portfolios. The target groups for this research comprised 27 fourth-year students of the Teaching Japanese Language Program, Faculty of Education, Khon Kaen University. I divided the research tools into two categories: (a) tools for learning management (four learning management plans and teaching logs) and (b) tools for collecting research data (the portfolio assessment form and e-portfolios). The research results revealed the project-based learning approach and e-portfolios improved the Japanese language and culture learning management competency in each indicator at different levels; in addition, the results reflected the Japanese language and culture learning management focusing on learners and the use of learning materials stimulated learners' interest and systematic working and helped them appreciate the efficiency of work and ability to work with others.

Keywords: project-based learning, electronic portfolio, Japanese language education

1. Introduction

At present, the production and development of teachers in Thailand are not keeping up with the rapid changes in the modern world, causing problems both in terms of teacher quantity and quality. Each year, the number of graduates from the teacher education programs is greater than the number of teacher fill rates. Moreover, in some fields, fewer candidates can pass the teacher recruitment exam. Although many projects are established to attract talented students to study to become teachers, the results of the Ordinary National Educational Test are still low. This is consistent with the results of international assessments such as PISA (Programme for International Student Assessment) or TIMSS (Trends in International Mathematics and Science Study), which have pointed out the problems of the quality of Thai education (ONEC, 2015). Thus, all teacher programs must review the structure of their curricula so that preservice teachers are developed in the right direction. The main duties of teacher education institutions are to consider academic proposals regarding teacher professional standards and teachers' competency; to integrate them into the curriculum; and to educate teachers according to the context, focusing on classroom teaching practices and pedagogical content knowledge (PCK; ONEC, 2018).

Currently, learning management at tertiary education has been adapted to meet the needs of society in the 21st century, so the development of work-readiness skills, especially professional skills or competencies, must be strengthened and developed before graduation. For institutions that educate teachers, preparation for "learning management competency" is a core professional competency for student teachers; however, developing it within the real school context is complex. Teaching via the designed learning plan is not merely an experiment; students and teachers must contemplate the learned experience to reflect the perception and understanding of the classroom practice's different dimensions and must be able to develop the perception of practicing and developing one's personal skills in the future. Because of this complex process, one must rely on a systematic learning management process: project-based learning. This is one of several methods that are aligned to enhance and develop the learning management competency for student teachers because the project-based learning environment enables students to learn more about their future profession from synthetic thinking rather than simply analyzing (Frank et al., 2003). It also allows students to practice critical thinking and to learn to work

together in a systematic manner (Roessingh & Chambers, 2011), which are essential skills for the teaching profession. However, project-based learning differs from problem-based learning (PBL), which focuses solely on problem-solving and ends with solving the problem (Suzuki, 2013, p. 45). However, project-based learning is a learning process with goals, and it is a process for creating new knowledge that allows students to test and push their ideas as they want, which promotes competency in innovation (Guo et al., 2020). Guo et al. (2020) reviewed several studies and found most addressed affective outcomes, such as the perceptions and benefits of learning. Nevertheless, studies on the student engagement process and the performance of students' final products are required because studying the performance of students' final products will help them apply and build their knowledge. They will also discover and develop their professional skills, resulting in a commitment to their duties and responsibilities and the ability to work with others (Guo et al., 2020).

In this research, project-based learning was the approach for training the teaching skills of preservice teachers in the context of learners' 21st-century education. The preservice teachers had to practice designing and organizing learning according to the active learning approach, which focuses on learners, task-based learning, project-based learning, and PBL. These approaches have received widespread interest in the study of the digital era. The same is true for the Japanese language teaching community. For example, in 2012–2013, the Japan Foundation, Bangkok, Thailand, in collaboration with the Kamenori Foundation, organized the Japanese Speakers Forum (JS-Forum) with the intent to exchange ideas about Japanese language learning in the 21st century. In 2016, the Japan Association for Language Teaching organized a seminar and mentioned active learning. In 2019, Yokomizo and Yamada (2019) released a book, *Active Learning for Japanese Language Teachers*. The first edition discussed active learning in the Japanese language with two main objectives: (a) to gradually change traditional Japanese language classes with new classroom activities and (b) to completely transform Japanese language classes with information technology. The aforementioned examples reflect the efforts of promoting active learning among those involved in Japanese language learning.

Preparing preservice teachers by changing the learning context is essential. Doing so not only provides Japanese language teachers with the characteristics that meet the needs of the modern Japanese language education context but also promotes opportunities for preservice teachers to absorb and build profound knowledge about the active learning process as learners. Therefore, in this research, the objective of using the project-based learning approach was to learn about Japanese language and culture learning management. The preservice teachers observed and analyzed the actual class to discover guidelines for designing suitable learning management; then, the goals were set. The data were collected, and the learning management was designed. Next, the learning management was implemented according to the set goals. However, project-based learning in a school context consists of the learning experience, which is a considerable amount of important learning information for reviewing oneself in the process of recognizing the goals to be achieved and proceeding as planned. For this reason, it is necessary to use an effective tool to manage learning information. This is consistent with Suzuki (2013), who mentioned that the "portfolio is a highly effective strategy connected to achieving goals. The portfolio is a student self-assessment tool for concrete examination and assessment, which is necessary for the development based on the modern education guidelines" (p. 24).

For the project-based learning in this study, the tool was also necessary to manage knowledge and to stimulate the exchange of knowledge among students to promote self-knowledge creation. Therefore, in this research, I used electronic portfolios (e-portfolios) to enable students to communicate with one another, actively cooperate in performing activities, and gain self-understanding through self-assessment. Managing information and knowledge resulting from systematic practice and self-reflection would help this project-based learning be effective. This is consistent with the research developing student teachers by using the portfolio as a tool for their reflection. A portfolio is an effective tool for teacher education courses. It is the foundation for creating knowledge from experience, devising meaning by the students themselves, and developing both expertise and commitment in the reflection process (Rahima & Donald, 1996). Using portfolios for reflection is different and complements other tools, such as diaries and small-group discussions. Using diaries allows students to reflect on what is happening daily, and using portfolios encourages students to obtain a broader perspective on their teaching experience or to review specific lessons for deeper understanding (Borko et al., 1997).

For the development of the learning management competency (the main goal of this research), I have defined its meaning as follows: "changes in knowledge, skills, and attitudes toward Japanese language and culture learning management for the better under the systematic implementation of the project-based learning approach to achieve the set goals, focusing on the learners and encouraging Japanese language learners (JLLs) to properly understand cultural differences by following the guidelines of active learning." Based on the definition, I created a competency assessment form based on the guidelines for teacher competency assessment in teaching and

curriculum development in Thailand. This comprises five indicators: indicator 1, curriculum construction and development; indicator 2, learning management design competency; indicator 3, student-centered learning management; indicator 4, use and development of innovative materials and technology for learning management; and indicator 5, measurement and evaluation of learning management (Office of the Basic Education Commission, 2010). Using portfolios stimulates student teachers' interest. However, the true purpose of project-based learning greatly affects students' learning, especially in terms of helping student teachers discover their true potential and realize how to self-develop in the future. Therefore, the study of the ideas arising from reflection is important to confirm the performance development results of preservice teachers. It is also a serious challenge to study the efficiency of using project-based learning and e-portfolios, which will affect the development of the preservice teachers' learning management competency.

1.1 Research Questions

- 1) How do preservice teachers develop their Japanese language and culture learning management competency using the project-based learning approach and e-portfolios?
- 2) How do preservice teachers reflect on their learning and practice using the project-based approach and e-portfolios?

2. Method

2.1 Research Design

This study involved a classroom action research that was conducted based on Plan Action Observation and Reflection (PAOR) or four steps (Kemmis & McTaggart, 1988). This research was conducted in three cycles, as presented in Figure 1.

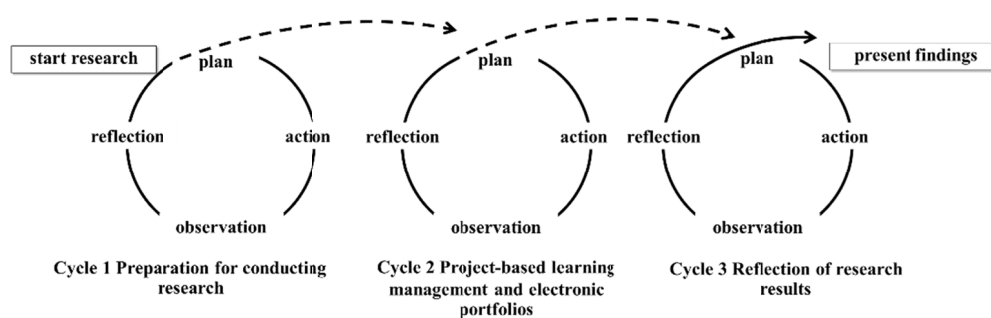


Figure 1. A diagram showing the classroom action research cycles

Cycle 1: This is the preparation of learning management using the project-based learning approach and e-portfolios. It is a cycle for developing the learning management plan, e-portfolios, and research instruments. It can be outlined as follows.

Step 1) Plan: I began conducting research planning by collecting information on problems and learning conditions from notes and observations of the learning management. I analyzed the data. The learning management plan was designed, and the pilot study was conducted.

Step 2) Action: I analyzed the learning management using the project-based learning approach and e-portfolios. Next, the data were used to design the research, and the research outline was written. The research tools were constructed.

Step 3) Observation: The accuracy and completion of all planning and research tools were checked.

Step 4) Reflection: The feasibility of the actual use of the research tools was evaluated. The errors of the tools were fixed before using them in the next cycle.

Cycle 2: This involves learning management using the project-based learning approach and e-portfolios. It is a learning management development cycle according to the four designed learning management plans. It can be outlined as follows.

Step 1) Plan: The project-based learning was planned to implement in the target groups using four plan-do-check-act (PDCA) cycles.

Step 2) Action: The learning management plan was implemented for learning management. It was done in accordance with each phase of the project, per a cycle. The research data were collected in accordance with the eight phases of the project’s implementation, as presented in Figure 2.

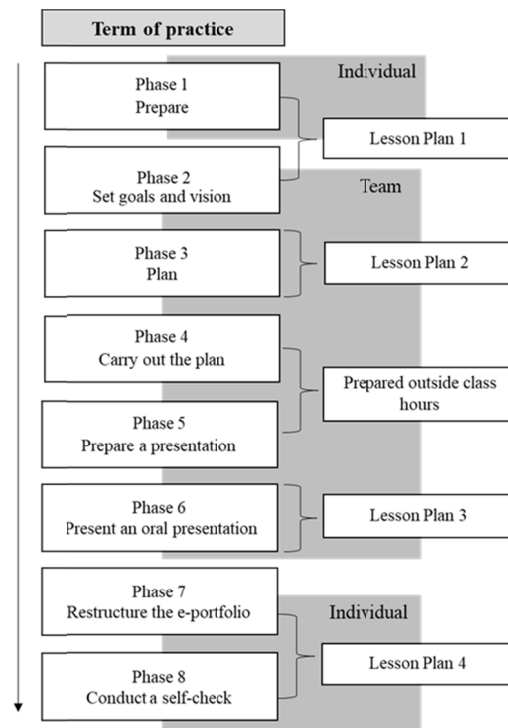


Figure 2. A diagram illustrating the learning management plan consistent with the project’s operational phases
Source: Suzuki, 2013, p. 173.

Step 3) Observation: This involves the results of learning management analysis by the learning objectives.

Step 4) Reflection: The reflections on the PDCA process of check (C) and act (A) were obtained using the Keep, Problem, Try (KPT) framework (Amano, 2013) to reflect thinking during the practice of each learning management plan, which helped set clear solutions for problem-solving and development in the next learning management plan.

Step 4) Reflection: The results of the learning management of all lesson plans and learners’ learning information in e-portfolios were summarized for reflecting the research results in the reflecting cycle. The process of cycle 2 is shown in Figure 3.

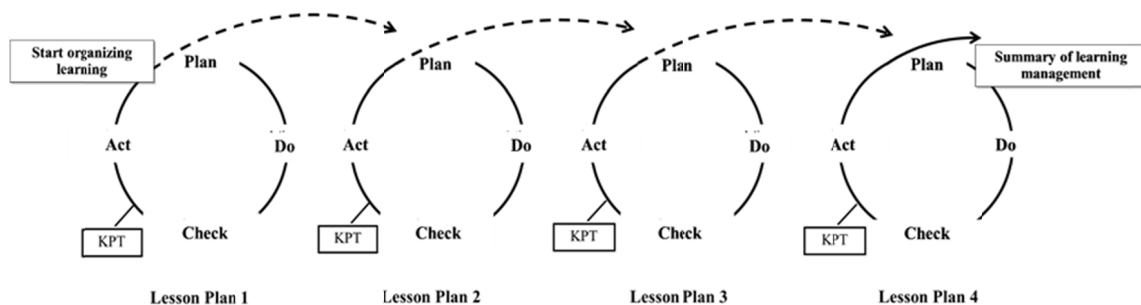


Figure 3. A diagram of cycle 2, presenting the learning management using the project-based learning approach and e-portfolios

Cycle 3: This is the reflection of the learning management using the project-based learning approach and e-portfolios.

Step 1) Plan: I planned to analyze the collected data and set the schedule for data analysis.

Step 2) Action: I analyzed the collected data according to the determined methods from the assessment form to calculate the performance and to reflect the learning management of the teachers and e-portfolios.

Step 3) Observation: I examined the results of the data analysis by the research questions, especially the learners' learning management competency assessment results.

Step 4) Reflection: The research results were reflected in the discussions, results, and conclusions. Finally, I wrote recommendations for future research.

2.2 Target Group

The target groups for the development were 27 fourth-year students aged 18 years and older in the Teaching Japanese Language Program, Faculty of Education, Khon Kaen University. This research is directly beneficial to the target group, who must prepare for learning management competency before teaching in the school as the Student Teaching Internship when they are in their fifth year. To encourage cooperation with the target groups, I took into account the ethical principles of research in all respects.

2.3 Research Tools

The research tools were divided into two categories: (a) tools for lesson plans, namely learning management plans and teaching logs, and (b) tools for collecting research data, including the portfolio assessment form and e-portfolios.

2.3.1 Four Learning Management Plans and Teaching Logs

I created the lesson plans. Then, three instructors in charge of the curriculum reviewed the learning management plans. Next, the learning management plans were revised and improved before applying them to the groups with qualifications similar to those of the target groups. Finally, the learning management plans were revised and corrected before using them with the real target groups.

2.3.2 Portfolio Assessment Form

I used the portfolio assessment form to assess the preservice teachers' learning management competency. To assess their learning management competency, I defined and adapted the assessment rubric from the teacher competency assessment guidelines (Office of the Basic Education Commission, 2010). The quality of the tool was examined by three experts in learning management competency assessment to determine the criteria for each indicator level. The item-objective congruence (IOC) index was 0.83, where the acceptable value is 0.50 and above. The content validity index (CVI) was 1.00, where the acceptable value is not lower than 0.80. Then, the portfolio assessment form was tested with groups with qualifications similar to those of the target groups before using it with the real target groups.

2.3.3 E-Portfolios

I created and developed the structure of the portfolio by studying and adapting it from Suzuki (2013). Then, the portfolio was piloted twice in the groups with qualifications similar to those of the target groups before the research data collection commenced. Next, three instructors in charge of the curriculum reviewed and commented on the portfolio. Then, I improved the portfolio and its content before applying it to the target groups. Finally, I activated the portfolio as an e-portfolio on the LoiLoNote School application.

2.4 Data Collection

In this classroom action research, I collected data from the competency assessment and the reflection of the students using the following methods.

1) Assessing the learning management competency of the preservice teachers: I considered the information from each student's e-portfolio, such as student's work pieces, records of portfolio restructuring, self-reflection in each practice phase, goals and vision records, operation plan, and self-assessment form; these were assessed after completing the project. The assessor was the instructor.

2) Collecting the reflection on the preservice teachers' learning: I compiled the information from the students' reflections in the e-portfolios' goals and vision records section; this was carried out after finishing the preparation of the portfolios in all components.

2.5 Data Analysis

I analyzed the data based on the research questions as follows.

1) First, I analyzed the development of the Japanese language and culture learning management competency from the portfolio assessment form. The percentages of the total number of the students were analyzed and presented in tables with descriptions. I determined the assessment criteria under the context and the practice of the target groups. The assessment was set in four levels based on an annotated approach: S = superior, which refers to a level higher than the set goals; A = excellent, which refers to a level that meets the set goals; B = good, which refers to a level that mostly meets the set goals; and C = satisfactory, which refers to a level that requires more effort to achieve the set goals. The assessment levels were determined according to the course objectives and the class direction. The results of these assessment levels were used as feedback for the preservice teachers. The preservice teachers also used these assessment levels to assess themselves in practice. Therefore, I used positive statements at all levels to encourage the preservice teachers to develop their learning management competency for better future practice.

2) Second, I analyzed the preservice teachers' reflections. These were the secondary qualitative data. The researcher analyzed the data from the reflection record form (e-portfolios). The data were classified according to the KPT framework (Amano, 2013) after the students wrote them in the record. I used the domain analysis technique to define inductive coding to group the sets of words based on the relations of each word. The data were presented in descriptive form.

3. Results

The results of the development of the Japanese language and culture learning management competency of the preservice teachers were as follows.

3.1 The Assessment of the Japanese Language and Culture Learning Management Competency

Table 1. The percentages and the numbers of the preservice teachers, assessed according to five indicators in each assessment level by an instructor (N = 27)

Assessment Levels	Number	Percent
Indicator 1: Curriculum construction and development		
Level S: Being able to construct and evaluate the course syllabus of the Japanese language and culture course and present the newly developed course	N/A	N/A
Level A: Being able to construct and evaluate the course syllabus of the Japanese language and culture course and identify the improvement and development issues appropriately	11	41
Level B: Being able to construct and identify the disadvantages or the advantages of the course syllabus of the Japanese language and culture course	16	59
Level C: Having to put more effort into constructing and evaluating the course syllabus of the Japanese language and culture course	N/A	N/A
Indicator 2: Learning design competency		
Level S: Being able to plan learning management systematically and predict the concepts and behaviors of learners in learning Japanese language and culture	19	70
Level A: Being able to plan learning management systematically by considering the thoughts and behaviors of learners in learning Japanese language and culture	N/A	N/A
Level B: Being able to plan learning management step by step but not considering the thoughts and behaviors of learners in learning Japanese language and culture	7	26
Level C: Having to put more effort into planning learning management systematically and considering the thoughts and behaviors of learners in learning Japanese language and culture	1	4
Indicator 3: Student-centered learning management		
Level S: Being able to manage student-centered learning according to the learning management plan and deal with unexpected events in appropriate ways	9	33
Level A: Being able to manage student-centered learning according to the learning management plan	16	59
Level B: Being able to manage student-centered learning but not actually in accordance with the learning management plan	2	7
Level C: Having to put more effort into managing student-centered learning according to the learning management plan	N/A	N/A
Indicator 4: Use and development of innovative materials and technology for learning management		
Level S: Being able to use information technology to create learning materials to support learning management or learner education	6	22
Level A: Being able to use existing information technology to support learning management or learner education	14	52
Level B: Being able to apply existing information technology to the classroom	7	26
Level C: Having to put more effort into applying existing information technology to the classroom	N/A	N/A
Indicator 5: Measurement and evaluation of learning management		
Level S: Being able to use measurement and evaluation methods and tools specific for the learner education	8	30
Level A: Being able to use measurement and evaluation methods and tools covering the learner education	13	48
Level B: Being able to use measurement and evaluation methods and tools but not covering the learner education	6	22
Level C: Having to put more effort into discovering measurement and evaluation methods and tools suitable for learner education	N/A	N/A

Note. N/A means no students were assessed at that level.

From Table 1, it was found that the assessment results on the Japanese language and culture learning management competency of the preservice teachers were mostly at level A, namely indicators 3, 4, and 5 accounting for 59%, 52%, and 48% of the total number of learners, respectively. For indicator 1, the assessment results were mostly at level B, accounting for 59% of the total number of learners, whereas those for indicator 2 were mostly at level S, accounting for 70% of the total number of learners.

3.2 The Reflection of the Preservice Teachers on the Use of the Project-Based Learning Approach and E-Portfolios (KPT Framework)

The reflection of keep (K) was the reflection on what the preservice teachers did best through practice. The results of the reflection were classified into two groups. In group 1, learning management skills, the preservice teachers reflected that they could create interesting and innovative learning materials. They tried to use materials to help students learn and applied technology to their learning management, which can create a fun classroom

atmosphere and make JLLs feel equal. For the design of learning activities, the preservice teachers noted they researched and selected content meeting the interests of JLLs and helping JLLs participate in the activities (e.g., games). In group 2, work skills, the preservice teachers noted they were able to realize their problems and solve them immediately. They also took into account what happened in advance and prepared to handle complicated work in their future. They also accepted the problems, stayed positive, strived to devise solutions, and made careful decisions. The preservice teachers had a positive view on teamwork; they personally listened to and accepted group members' opinions. They were also willing to help others and had fun at work. In addition, they were able to schedule both their own work and group work. They could manage time, plan work, and successfully operate their work. They also kept calm at work and thought systematically.

The reflection of problem (P) was the reflection of the problems and the problems' changes from practice. The results of the reflection were classified into two groups. In group 1, learning management problems, the preservice teachers felt anxious about their ability in terms of knowledge transfer and communication. They had a superficial attitude and perspective toward learning and organizing Japanese language and culture learning. They also did not focus on and understand the design of learning management. They did not know how to organize the instruction and the content. They lacked confidence in writing the learning management plan and did not consider the content's needs and suitability for JLLs. However, after implementing the project, the preservice teachers felt more relaxed and confident in their ability. They realized the importance of teaching Japanese culture equally to teaching Japanese language. They also had a greater understanding of teaching sequencing and writing the learning management plan. Moreover, they were concerned about the needs and suitability of the content for JLLs. In group 2, work problems, the preservice teachers felt they did not dare to express honest opinions to the group members. They worked quite slowly without knowing what to do and how to do it. After implementing the project, the preservice teachers felt they were more courageous in expressing their opinions and became more positive with the group members. They also felt they had a systematic work process, starting from researching and planning.

The reflection of try (T) was the reflection of the skills or methods for better future practice learned from practice. The results of the reflection were classified into two groups. In group 1, learning management skills, the preservice teachers realized student-centered learning management. They reflected related learning management styles, such as constructing physical activities, setting up an active learning classroom, and allowing JLLs to share their opinions (not just practice). They also noted they realized the importance of designing and selecting content meeting the needs and the interests of JLLs. They took into account the creation of a classroom teaching Japanese language and culture and foresaw that type of classroom's future benefits for JLLs. The preservice teachers also recognized the importance of employing learning materials, such as selecting appropriate pictures, using animation media and games for learning, and creating slides to attract and support the learning of JLLs. They thought these skills must always be learned and developed. In addition, they thought creating fun lectures for learning and motivating JLLs through the process of self-learning could create long-term memory, which is a necessary skill for future classrooms. In group 2, work skills, the preservice teachers reflected that searching for information must be done technically, and the correctness of the information obtained must be checked. Searching for information from a variety of sources is also required, and the obtained information must be reliable. Inquiring from knowledgeable persons is another way to receive information. From the practice in the project, the preservice teachers thought the ability to solve problems should begin with developing knowledge and experience and then predicting what might occur. When facing problems, consciousness and consideration for finding solutions are required. Getting ready and not panicking are recommended. Working systematically as well as planning, checking, and recording performance are also required. In addition, they reflected that teamwork is beneficial for future schoolwork, which requires communication, encouragement, listening, and bravery in expressing opinions to colleagues and other teachers in the school.

From the results of the preservice teachers' reflections through analysis using the KPT framework, it showed the linkage of the learners' three coherent learning concepts, classified into two groups: learning management skills and work skills (including the ability to work with others).

4. Discussion

The research results revealed that three indicators of the preservice teachers' learning management competency development were on the same level (a) student-centered learning management (b) use and development of innovative materials and (c) technology for learning management, measurement, and evaluation. In addition, the learning management design competency indicator was higher than the other indicators. It was also found that the curriculum construction and development indicator was lower than the other indicators. Thus, the comparison of the development results between the two indicators with the highest and lowest assessment results

according to Table 1. According to the project-based learning process, the preservice teachers had to revise their learning management plans and receive multiple reviews from their peers of different groups and instructors until their learning management plans were complete. Therefore, the learning management design competency indicator was at a higher level than the other indicators; while performing repetitive thinking processes, the nervous system can transmit information more quickly. During practice, experiences and observed and encountered stimuli will cause the brain to change, which will enhance the learners' ability and intelligence (Tokuhamma-Espinosa, 2010). Therefore, when the students and instructors created an iterative process for creating the learning management plan after hearing others' criticism, it significantly increased the development of the learning management design competency indicator more so than any other area.

By contrast, for the curriculum construction and development indicator, which allowed instructors to design and evaluate the course outline, it was found the majority of the students and instructors could identify and solve problems. However, the obtained information was not enough for improving and creating a new course outline. For this reason, the assessment results of this indicator were at the lowest level. Clearly, organizing learning management only once in this research did not lead to sufficient data collection to develop and improve the course outline. Therefore, I have realized that the project-based learning approach with a long period of practice is required to allow students to review the cycle of practice, improve, and solve various problems before developing the new course outline. This is consistent with Heckendorn (2002), who stated, "Anything in real life is naturally complex. So, it takes a long time to implement the project-based learning before it can be completed" (as cited in Gülbahar & Tinmaz, 2006, p. 311).

From the reflection results, I found the preservice teachers had learned from the experience in project-based practice. It reflected the attitude change that the preservice teachers learned from solving problems in the project, both in learning management and in working. This is consistent with Roessingh and Chambers (2011), who posited project-based learning allows learners to practice critical thinking and learn to work together systematically. In addition, the project-based learning approach and e-portfolios helped the preservice teachers be aware of their own strengths; this allowed me to recognize the concept of the preservice teachers who were aware of their own strengths and values, which can encourage students not to give up in terms of improving themselves. This behavior can be explained by self-awareness theory, which involves having an independent self-concept that can direct one's learning and being more motivated internally than learning externally (Duval & Wicklund, 1972, as cited in Merriam & Bierema, 2014). Thus, these are the learning outcomes from the practice and from strengthening the learning management competency to prepare the preservice teachers directly for their future work.

In this study, using e-portfolios made it easier to access the preservice teachers' personal learning information. Moreover, the students and instructors could monitor and evaluate the performance effectively, resulting in an enthusiasm and a desire to make the next phase of the project better until the goal was achieved. In terms of the results of e-portfolio use, I found self-assessment and the recording of reflections during practice helped the preservice teachers be responsible and appreciate their opinions, resulting in self-esteem. This is consistent with Gülbahar and Tinmaz (2006), who explained project-based learning helps learners take control of their learning and classroom activities. This is also in accordance with Suzuki (2013, p. 24), who stated the "portfolio is the best tool for concrete self-assessment and is required to develop modern education guidelines." Therefore, this research's learning environment and the use of e-portfolios allowed the preservice teachers to manage their practice, push themselves from the information recorded, and exchange that information with other members.

This study was conducted in a short period, so the preservice teachers experienced only one round of organizing learning management; this was not enough to develop a consistent performance level for all indicators. In addition, this study cannot fully conclude how the preservice teachers developed their Japanese language and culture learning management competency because the competency was not studied before using the project-based learning approach, and the research was conducted only after the content-based teaching of regular classroom courses.

5. Conclusion

In this research, the development of the preservice teachers' learning management competency using the project-based approach and e-portfolios presented the concept for the learning management of the courses in the teacher production curriculum, focusing on allowing the preservice teachers to study content as well as study and understand the learners' nature and learning process, consistent with the PCK concept and classroom teaching practice. The research results pointed out the thinking process toward the preservice teachers' introspective practice. The results also showed using the project-based approach and e-portfolios not only developed the

teachers' learning management competency but also helped them gain knowledge regarding systematic work, planning and time management, and teamwork, which are desirable attributes for preservice teachers.

6. Limitations of the Study

First, the duration of learning management using the project-based learning approach and e-portfolios should be longer, or students should be allowed to have repeated practice in the project-based learning process so that changes and developments that occur during the process can be seen clearly. The development of the preservice teachers' learning management competency should be promoted to be consistent in all indicators.

Second, if a study of the results is conducted when the preservice teachers start working in school, then the effectiveness of developing the learning management competency (from the project-based learning approach and e-portfolios) can be seen concretely. A reflection on the improvement and development of this learning management approach should be conducted as well.

Third, to develop the teaching quality of preservice teachers, Japanese language proficiency and Japanese language learning management must be developed simultaneously. This research has proven using the project-based learning approach and e-portfolios allowed the preservice teachers to develop their learning management competency as well as work skills and teamwork. Therefore, if this learning management process is applied when developing preservice teachers' Japanese language competency—Japanese skill that requires a period to be proficient—then the study results will be fascinating.

References

- Amano, M. (2013). *That's it! KPT*. Japan: Subarusya. [in Japanese]
- Duval, S., & Wicklund, R. A. (1972). *A Theory of Objective Self Awareness*. New York: Academic Press.
- Frank, M., Lavy, L., & Elata, D. (2003). Implementing the problem-based learning approach in an academic engineering course. *International Journal of Technology and Design Education*, 13, 273–288. <https://doi.org/10.1023/A:1026192113732>
- Gülbahar, Y., & Tinmaz, H. (2006). Implementing project-based learning and e-portfolio assessment in an undergraduate course. *Journal of Research on Technology in Education*, 38, 309–327. <https://doi.org/10.1080/15391523.2006.10782462>
- Guo, P., Saab, N., Post, L. S., & Admiraal, W. F. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*, 102, 101586. <https://doi.org/10.1016/j.ijer.2020.101586>
- Heckendorn, R. B. (2002). Building a beowulf: Leveraging research and department needs for student enrichment via project-based learning. *Computer Science Education*, 12(4), 255–273. <https://doi.org/10.1076/csed.12.4.255.8620>
- Kemmis, S., & McTaggart, R. (Eds.). (1988). *The action research planner*. Victoria, Australia: Deakin University Press.
- Knoll, M. (2014). Project Method. In D. C. Phillips (Ed.), *Encyclopedia of Educational Theory and Philosophy* (Vol. 2, pp. 665–669). London, England: Sage.
- McClelland, D. C., & Litwin, G. (1967). *A brief scoring manual for achievement motivation*. Boston, Massachusetts: McBer & Co.
- Merriam, S. B., & Bierema, L. L. (2014). *Adult learning: Bridging theory and practice*. San Francisco: Jossey-Bass.
- Office of the Basic Education Commission. (2010). *Teacher Competency Assessment Manual 2010*. Bangkok: The Agricultural Cooperative Association of Thailand Press. [in Thai]
- ONEC. (2015). *The Current Stage of Teacher Preparation and Development in Thailand*. Bangkok: Department of Educational Standards and Learning Development, Office of the Education Council. [in Thai]
- ONEC. (2018). *The Development of Mechanisms to Drive the Production System and Develop High-performance teachers for Thailand 4.0*. Bangkok: Department of Educational Standards and Learning Development, Office of the Education Council. [in Thai]
- Rahima, D. W., & Donald, B. Y. (1996). Portfolios: A tool for reflective thinking in teacher education. *Teaching & Teacher Education*, 12(1), 63–79. [https://doi.org/10.1016/0742-051X\(95\)00022-C](https://doi.org/10.1016/0742-051X(95)00022-C)
- Raven, J., & Stephenson, J. (Eds.). (2001). *Competence in the learning society*. New York: Peter Lang.

- Roessingh, H., & Chambers, W. (2011). Project-based learning and pedagogy in teacher preparation: Staking out the theoretical mid-ground. *International Journal of Teaching and Learning in Higher Education*, 1(23), 60–71.
- Suzuki, T. (2013). *Basics and methods of project learning to acquire problem-solving ability and logical thinking ability*. Tokyo: Education Publishing. [in Japanese]
- Tokuhama-Espinosa, T. (2010). *The new science of teaching and learning: using the best of mind, brain, and education science in the classroom*. New York: Teachers and College Press.

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