

Technology Enhanced Project-Based Learning in Teacher Education: Experience of Pre-service EYL Teachers

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Abstrak

Pendidikan abad ke-21 menuntut guru untuk mampu mengintegrasikan teknologi, materi pelajaran, dan pedagogi secara sistematis. Dalam mempersiapkan calon guru bahasa Inggris anak yang kompeten, integrasi teknologi perlu diajarkan secara eksplisit. Penelitian ini menggali pengalaman 6 calon guru bahasa Inggris dalam mempersiapkan bahan ajar digital untuk kelas bahasa Inggris anak. Penelitian ini menggunakan pendekatan kualitatif dengan desain *narrative inquiry*. Data diperoleh melalui *oral narrative*, yaitu wawancara dan *written narrative*, yaitu *narrative frames*. Data dianalisis menggunakan *inductive content analysis*. Hasil penelitian menunjukkan bahwa meskipun calon guru menghadapi beberapa kesulitan selama proses merancang bahan ajar digital, mereka mendapat kesempatan melatih kemampuan berpikir kritis, komunikasi dan teknologi. Mereka juga menyebutkan bahwa proyek ini memungkinkan mereka untuk menerapkan pengetahuan pedagogi mereka tentang gaya dan strategi belajar anak-anak. Secara keseluruhan, mereka yakin pengalaman ini akan bermanfaat bagi kompetensi pedagogik dan profesional mereka di era digital saat ini.

Kata Kunci: calon guru, *English for Young Learners*, pembelajaran berbasis proyek, integrasi teknologi.

Abstract

21st century education requires teachers to integrate technology, subject matter and pedagogy in a systematic manner. To help pre-service teachers create appealing lessons to young English learners' styles and strategies in digital era, technology cannot be taught separately. This paper highlights 6 prospective English teachers' actual experience of the process they went through as preparing digital teaching resources for young English language learners. Employing narrative inquiry, the experiences of 6 students were gathered by means of oral narrative and narrative frames. The data then were analysed using an inductive content analysis. The findings show that while the pre-service teachers encountered some difficulties during the process, they value the projects to exercise their critical thinking, communication and technology skills. They also mention that the project allows them to apply their pedagogical knowledge about young learners' learning styles and strategies. All in all, they believed the experience would benefit their pedagogical and professional competence in the current digital era.

Keywords: *English for Young Learners*, *Project-based learning*, *technology integration*, *pre-service teachers*.

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INTRODUCTION

Education in the 21st century demands learning approaches which prepare students with relevant and competitive abilities, such as critical thinking, creativity, communication, collaboration and digital competence (P21, 2007). Therefore, integrating technology into the learning process and student-centered learning approach in English classrooms are the key to developing students' abilities to meet the demands of the 21st century skills. At national level, the Ministry of Education of Indonesia mandates that the learning process needs to focus on learners (learner-centered), general English learning included elements of receptive and productive skills, as well as the learning process needed to be supported by visual aids and non-verbal communication to help students communicate (National Education Standards-Government Regulation Number 4, 2022). Likewise, the Ministry of Education and Culture's 2020-2024 Strategic Plan includes the digitalization of education program in which teachers needed to utilize technology to support the learning process so that the quality of learning improves.

Thus, the current education situation at both global and national levels require teachers to be able to integrate technology, subject matter and pedagogy in a systematic manner (Mishra & Koehler, 2006). This is the case because teacher is the key factor in the implementation of pedagogy. Therefore, English teacher education program needs to prepare teachers who are fluent in English as well as master pedagogy knowledge and digital competency. Unfortunately, researches across various English classroom contexts concluded that many teachers have difficulties in integrating technology. For example, English teachers' attitude in Morocco (Ismaili, 2021) and Turkey (Çakici, 2016) mostly prevent them from integrating technology. Further investigation shows that teachers' technical levels also hinder technology integration in English classroom (A. H. Lubis, 2018). As such that studies suggest that digital literacy digital literacy needs to be explicitly taught and learnt because being digital natives does not guarantee the skill to integrate ICT (Casillas Martín et al., 2020; Li & Ranieri, 2010; List, 2019).

The adoption of Project Based Learning (PBL) in many teacher education programs have been successfully promote many areas of learning (Avidov-Ungar & Tsybulsky, 2021) and development of 21st century skills, such as problem-solving and communication skills (Krajcik & Shin, 2014; Park & Hiver, 2017) as well self-confidence and self-efficacy (Brennan et al., 2013; Jaya & Rosmiyati, 2019; N. Lubis et al., 2020; Nandiana et al., 2021). PBL is also applicable at all level of education (Abualbasal & Badran, 2019; Dooly & Sadler, 2016; Insyasiska et al., 2015; Koparan & Guven, 2014). Many studies integrated technology in PBL in teacher education programs and it was found that such intervention help pre-service to (1) develop CALL competency (Tseng & Yeh, 2019), (2) gain in digital and higher-order thinking skills (Belda-Medina, 2021) and (3) form their role perception as digital-age teachers (Avidov-Ungar & Tsybulsky, 2021; Koşar, 2021).

This study investigates English pre-service teachers' experience in preparing digital teaching resources and activity design for young English language learners. The findings presented in this research have the potential to expand the current literature on incorporating PBL in the English teacher education program.

METHOD

Research Design

This study employed narrative inquiry research where participants share detailed stories of a certain experience (Barkhuizen et al., 2013). The present research illuminates students' experience in designing digital teaching resources for young English language learners.

Research Site and Participants

The study involved six participants, i.e. Tika, Naima, Ramadhan, Raka, Nani, and Linda (pseudonyms). This study was conducted in Instructional Media and Activities of EYL (ING6060), an elective course in an English Education Department at a public university in Indonesia. This study took place during academic year 2023. The objective of the course were students to (1) evaluate and use effective media appropriate for young learners in EFL classroom and (2) develop appropriate activities for teaching the four skills and vocabulary. For this study, four meetings were conducted to immerse the pre-service teachers in a Technology-Enhanced Project Based Learning. Students were working in groups of three to design digital teaching resources and activity design for English for Young Learners (EYL) class within the topic of "sea creatures". In designing the teaching resources, students used a free application, i.e., Wordwall.net. Students then submit the draft of the design in the class' Learning Management System. Following feedback from the teacher, students made appropriate revision of the digital teaching resources. Table 1 presents the design of classroom activity.

Table 1. Lesson plan

Meeting	Aims
1	1. Students discover the principles in designing activities for teaching the language skills to young EFL learners 2. Students familiarize with the features of Wordwall
2	1. Students analyze the lesson (sea animal) and design the learning activity for the lesson 2. Students create a digital activity in Wordwall
3	Students finalize the design of activity in Wordwall
4	Students share their final design of Wordwall activity to class

Data Collection and Analysis

Data triangulation was applied in the research that a variety of personal narratives, i.e. oral narratives and narrative frames, were collected to gather the six students’ experience in creating a digital English activity for Young Learners. The participants elaborated their experience in planning and designing the digital media. They also shared how these experiences contribute to their future professional practice. The narratives were written and told in bahasa Indonesia. Their narratives were then translated into English by the fourth author. Their narratives were analyzed for patterns and themes. Last, member checking was conducted to validate the researchers’ interpretation.

FINDINGS AND DISCUSSION

Findings

Design of Digital Media

The aim of this study was to explain the experience of pre-service English teachers in designing digital media for EYL students through PBL. The technology used was Wordwall, which could be used for vocabulary learning for EYL students. Pre-service teachers could explore their digital or technological abilities to develop students' vocabulary skills and engagement in learning. Pre-service teachers could choose themes, templates, timers, and other settings the technology provides. Thus, pre-service teachers could organize learning according to the teaching materials provided.

As shown in Figure 1 and 2, the learning material which was designed by the pre-service teachers is flashcards of pictures and words about “sea creatures”. The flashcards can be flipped by clicking the cursor. The flashcards is used in matching game which allows students to match the pictures with the words. Should the pictures match with the words, the students need to click ✓. Meanwhile, when the pictures do not match with the words, students need to click X.

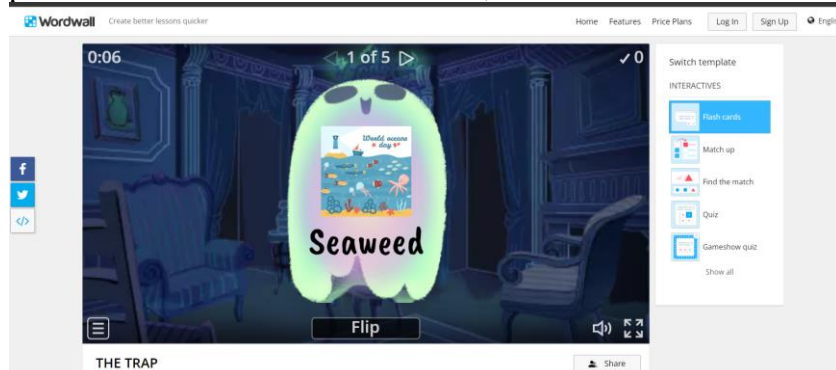


Figure 1. Wordwall: The Trap

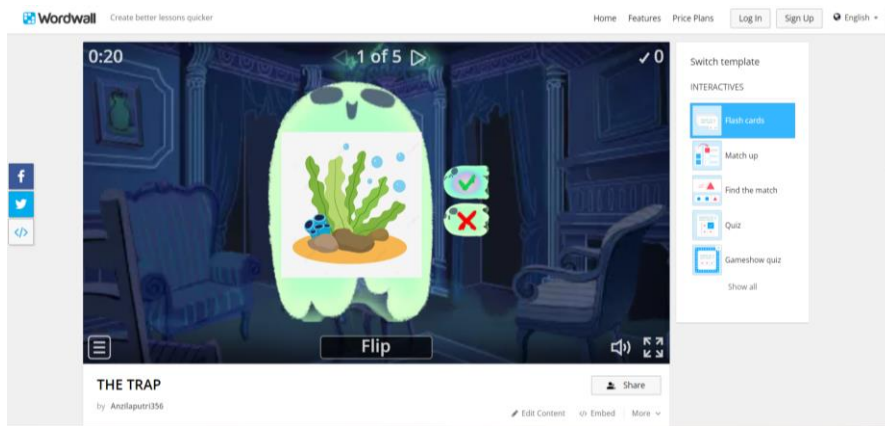


Figure 2. Wordwall: The Trap (Flip)

Another group of pre-service teachers used an anagram template with the ocean animals theme. In this template, students must arrange the random letters in the vocabulary to match the picture. As shown in Figure 3, the image shown was a turtle and random letters consisting of "l, r, t, e, t, u." Students must arrange the letters according to the English word "turtle". Teacher candidates were also set up for the leaderboard in this game. Therefore, students with higher scores with shorter composing time would be ranked first. Wordwal.net would display the correct "checklist" marked instead of the letter (Figure 4). Meanwhile, if the student arranged the letters incorrectly, the word wall media would display a "cross" (Figure 5).

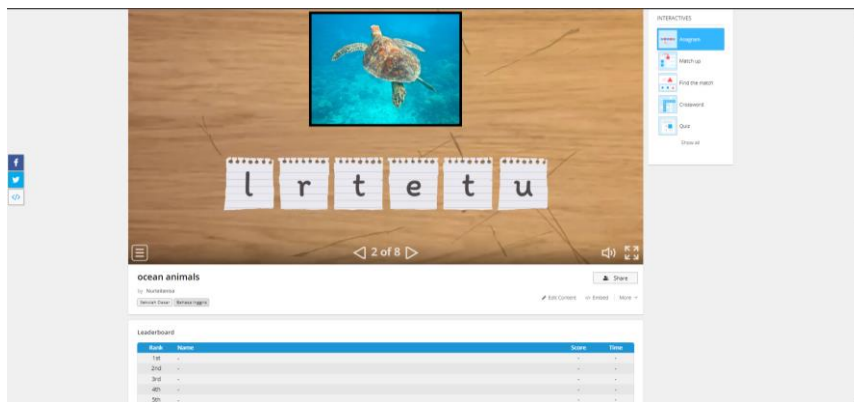


Figure 3. Ocean Animals Anagram

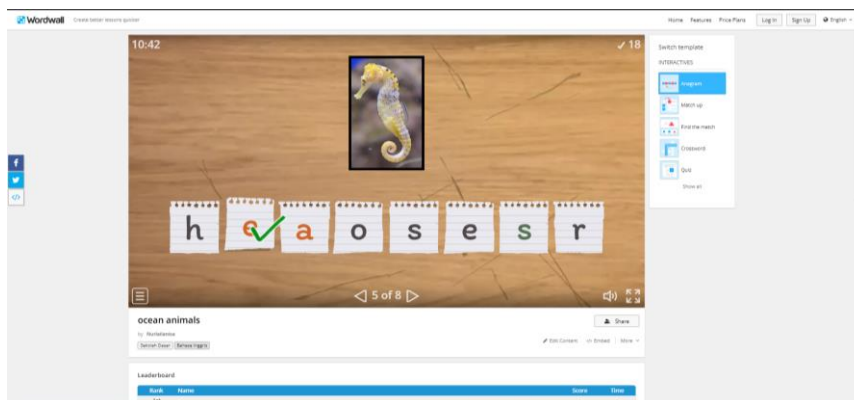


Figure 4. Ocean Animals Anagram (Correct)

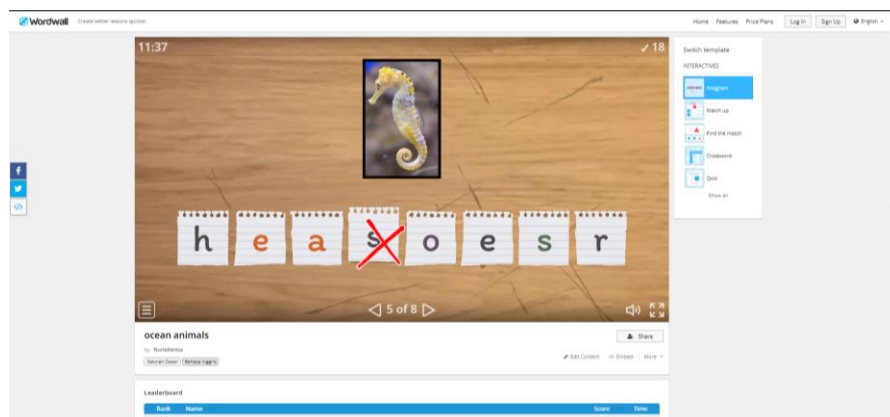


Figure 5. Ocean Animals Anagram (Incorrect)

Critical Thinking

The hands-on experience to design digital media for young English learners provided opportunity for the pre-service teachers to train their critical thinking skill.

"We make sure the visuals are appealing to Young Learners"

"We consider the Young Learners' age when designing the activity. So, it is not too difficult for them"

It was found that the critical thinking process for pre-service teachers emerged when the pre-service teacher considered the visualization and design of the media designs that were made. They thought and analyzed the design in advance to adapt to the age of young learners and make it easy for students to do it. It suggested that pre-service teachers learn to be responsive to students' needs in designing and adapting learning activities. They learned to identify factors such as the student's age and used that knowledge to design appropriate activities. It helped pre-service teacher improve their ability to think critically in an educational context. They could consider various aspects that affect learning, including student characteristics, to create an appropriate and effective learning environment for students' cognitive and psychosocial development.

Communication – Collaboration

The whole project development process allowed the pre-service teachers to communicate and collaborate with their peers. It could be seen in the statements of the participants:

"We all are close friends. We could "understand" each other. Everyone contributes to the project"

"We can work together. But one member lacks of responses. He's working. In the end, he contributed, although little"

The findings show that most of the participants have good communication and collaboration skills, in which group members contribute to the project. Likewise, the group members are good friends so they are used in solving problems among themselves. However, another group had to work with one member who lacked of response during the project completion. Although he eventually participated in the project, his contribution was considered scant. It described the importance of communicating and cooperating in the learning environment. Pre-service teachers must have practical communication skills to understand and support one another. In addition, good collaboration allowed them to work together as a team to

achieve a common goal. Thus, these findings showed the importance of developing communication and collaboration skills in project-based learning with technology in pre-service teachers.

Creativity

The pre-service teachers demonstrated creativity skill not only in designing the digital media, but also in solving problems. It was found that the pre-service teacher was unfamiliar with the platform and they successfully solved the problem using their creativity.

"It was our first time using Wordwall.net. We browsed the site and saw samples activities. We also looked at some tutorials video"

The data described that in the experience of based learning projects using technology, pre-service teachers had new experiences using the Wordwall.net platform. They used their creativity to explore and learn from examples of activities on the site and watched several video tutorials. The exploration stimulated pre-service teachers to develop their creativity in designing learning activities. This new experience allowed them to try various approaches and creative ideas in designing interesting and effective learning activities using technology.

Likewise, the technology enhanced project based learning helped pre-service teachers to acquire gained and digital thinking skills, such as create, analyze, and evaluate.


"The experience strengthen my ability to create creative media for Young Learners"

The data showed that technology could benefit pre-service teachers in improving higher-order thinking skills, such as creating, analyzing, and evaluating, especially in project-based learning using technology. Pre-service teachers stated that technology could strengthen their ability to create creative media for young learners. It showed that technology helped pre-service teachers develop creative skills to create interesting and innovative learning media. In addition, technology also allowed pre-service teachers to analyze and evaluate the effectiveness of the learning media they had created. They could collect data and get feedback from students about using the media. Thus, they could identify the strengths and weaknesses of the media they had made. It allowed pre-service teachers to improve the learning media they created to better suit students' needs and preferences.

Technology Skill

The ability of pre-service teacher technology was also instilled in the project completion. It was found that the teacher asked the pre-service teacher to reset sharing settings. The findings of this study stated that despite being digital natives who could manage technology, the pre-service teachers need to take considerations in regards to use technology for teaching. There was a link error during submission, the pre-service teacher fixed it by providing the correct link for their work group. It showed that pre-service teachers understood and were competent in using technology to support learning. They could organize and use technology effectively to collaborate with their peers on projects, including using links to share and submit assignments. Figure 6 shows the screen capture of the feedback from the teacher.

2 komentar pribadi

 Evi Karlina 1 Mei
Wordwall tidak bisa dibuka.

Tolong atur ulang settingan berbagi supaya saya bisa cek


 1 Mei
Baik, mrs. Mohon maaf mrs sepertinya sewaktu mengumpulkan ada kesalahan link yang dilampirkan dari kami karena link tersebut ternyata untuk berbagi ke satu kelompok agar bisa dikerjakan bersama. Berikut link yang benar, mrs: <https://wordwall.net/resource/55236604> (Pertemuan 1), <https://wordwall.net/resource/55916582> (Pertemuan 2). Terima kasih banyak, mrs.

Figure 6. Teacher feedback

Form Their Role Perception as Digital-Age Teachers

At the same time, the data also showed that the technology had a role for pre-service teachers as digital-age teacher. As they argued:

"Technology extends media option and quality"

"Technology helps teachers to be efficient"

"I practiced using technology for teaching. I can use the experience once I am officially a teacher"

The data showed that technology had a significant role in learning, especially in project-based learning using technology. Two key findings were that technology was expanding media's options and quality and helping teachers become more efficient. It showed that technology was becoming a powerful tool to enhance learning in this digital era. The technology helped pre-service teachers to take advantage of various options and quality media in designing learning experiences that were more interesting and varied. Technology allowed using various media, such as images, videos, animations, and other interactive resources, enriching learning and making it more interesting for students. In addition, technology also helped pre-service teachers to be more efficient in teaching. Pre-service teachers could use various educational applications and software that could assist in compiling and delivering learning materials more easily and effectively. It allowed pre-service teachers to focus on better learning strategies, better support students, and create more interactive and meaningful learning experiences.

The findings of this study indicated that pre-service teachers experience practicing using technology in the teaching process. This valuable experience could be used later when they become teachers. Practical experience using technology as a teacher candidate could be an essential first step in developing their technological capabilities. Pre-service teachers could gradually improve their technological skills by practicing technology in learning.

Discussion

The findings show that the experience in involving the technology enhanced project based learning allows students to develop digital-age teacher competences, i.e. critical thinking, communication and collaboration, creativity, as well as technology skill. Likewise, the hands-on experience shaped their perception as teachers in digital era. The pre-service teachers value the project in developing digital teaching media to prepare them for their career.

Indeed, research showed that technology could help pre-service teachers develop digital abilities and competencies. Their activity of practicing to design teaching media that had never been used was an effort made to master technology as a teaching medium. A study showed that pre-service teachers show increased Computer-Assisted Language Learning (CALL) competence which is higher after the PBL project (Tseng & Yeh, 2019). These findings provided important insights for prospective teachers in designing and implementing practical teaching training for CALL competency development. This research provided a deeper understanding of how PBL could improve CALL competencies in EFL

teacher candidates and provided insights into the potential and challenges of adopting this learning method in the context of CALL competency development.

Through technology implementation during training, pre-service teachers could improve and strengthen their creativity and critical thinking skills, i.e. create, analyze, and evaluate. With the digital competency acquired, pre-service teachers could develop their ability to create interesting and interactive teaching media for students. However, the pre-service teacher could also analyze errors or deficiencies in the media that were made. Thus, they could evaluate it for further learning. CALL's abilities and digital and higher thinking were integrated to support pre-service teachers in improving learning media that were needed, interesting, and interactive for students. It aligned with a research which shows that pre-service teaches could improve their higher-order thinking skills in making, analyzing, and evaluating teaching media for their learning during project-based learning practices (Belda-Medina, 2021).

Likewise, the hands-on experience would provide opportunity to instill communication and collaboration skills. This finding shows that the experience expands the pre-service teachers' communication and collaboration skills to finish the project (Park & Hiver, 2017). In fact, this research demonstrated that a good communication skill enables students to solve problems raised during the project completion which leads to maintain collaboration. This extends findings that real-life activities project allows students to solve problems (Krajcik & Shin, 2014).

The pre-service teachers' experience in designing digital media helped them to perceive the experience of teachers in digital-age. They had the opportunity to experience the challenges and advantages in incorporating technology for learning. Indeed, technology could be a tool to help pre-service teachers to improve the quality of their learning. Improving learning quality could be done by making learning media interesting, interactive, and age-appropriate for students. Technology also could make teaching more efficient and effective. This "authentic-like" experience in designing digital media enable pre-service teachers to shape their perception of their role as digital-era teachers (Avidov-Ungar & Tsybulsky, 2021). Another study reported that engaging in a PBL made the pre-service teachers feel like "a real teacher" (Koşar, 2021).

CONCLUSION

Technology-Enhanced Project-Based Learning is becoming an essential element in teacher education in the 21st century. The results of the study show that the experience provides valuable learning experiences for pre-service EYL teachers, enables them to develop higher-order thinking skills, and improves the quality of learning relevant to the demands of the 21st century. In order to face the challenges of this era, teacher education needs to explicit training in the use of technology for learning, including strategies for integrating technology into the curriculum and using technology for learning evaluation. However, it should be acknowledged that this research has several limitations, such as the use of only one task in the study and the absence of explicit measurement of the technological competency of pre-service EYL teachers. Therefore, further research with various tasks and more detailed assessments needs to be carried out to understand the impact of Technology-Enhanced Project-Based Learning on the development of their technological competence. This study clarifies that the explicit training to instill technology skill in teacher education institution offers many advantages. Therefore, teacher education institution might need to formulate effective Technology-Enhanced Project-Based Learning for digital-age teachers.

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