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Research Paper

ICT-based Classroom Instruction Design: Exploring EFL Pre-Service Teachers' Perception of Project-Based Learning Strategy for Developing Pedagogical Competence

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Abstract

This study focused on examining EFL pre-service teachers' perception and experience on the implementation of project-based learning strategy to develop pedagogical competence and how EFL pre-service teachers can design ICT-based classroom instruction. An evaluative case study approach was used and six pre-service teachers in higher education level who were taking an English instructional technology course at a private university in Indonesia were involved. The data were collected from semi-structured interviews, fieldnotes, and learners' diaries. Thematic analysis was used to interpret the data. The findings showed that based on pre-service teachers' perception and experience, Project-Based Learning strategies are successful in developing their pedagogical competence within the context of English instructional technology, in which EFL pre-service teachers could create English instruction or lesson plan. Moreover, this study suggested that

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through Project-Based Learning, EFL pre-service teachers could integrate Information and Communication Technology (ICT) in designing ICT-based classroom instruction design. Thus, this study recommends that incorporating ICT into PjBL is effective in improving pre-service teachers' instruction design.

Keywords: Project-Based Learning (PjBL), EFL Pre-service Teacher, Pedagogical Competence, ICT-Based Classroom Instruction Design

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1. Introduction

Project-Based Learning (PjBL) has attracted considerable attention within higher education. Many often perceive project-based learning as a shift from the traditional teacher-led education model (Maros, et al, 2023). As outlined by Puztai (2021), PjBL facilitated active engagement among students and enhanced essential 21st-century skills. It has also emerged as a recommended method for achieving course objectives. Considering this, Almula (2020) observed that PjBL was widely acknowledged for educational purposes among students and should be actively promoted within universities. Similarly, Hanak (2021) asserted that university-level research on PjBL demonstrated its effectiveness in enhancing students' methodological, transversal, and professional skills. Besides, research in this area has consistently advocated for PjBL to enhance students' pedagogical competence. In accordance with this perspective, Tsybulsky and Rozanov (2021) reported that by integrating PjBL into teaching instructions, pre-service teachers predominantly obtained positive experiences, which were associated with increased motivation, skills, and knowledge which positively impacted the development of their pedagogical competencies. Additionally, Meng et al. (2023) revealed that both pre-service and in-service teachers possessed the necessary skills and knowledge to effectively implement PjBL

and ensured optimal learning outcomes for students.

The EFL learning field is always changing, and educators are continuously looking for ways to enhance the language learning experience for their students (Elmahdi et al, 2024). Zhang and Wang (2023) pointed out that PjBL-based courses have proven effective in improving the language skills of pre-service English teachers. These skills cover listening, reading, speaking, writing, grammar, and translation which are crucial for achieving proficiency in teaching English as a Foreign Language (EFL). Additionally, Gomez (2017) observed that pre-service teachers also acknowledged the importance of enhancing their teaching skills by gaining pedagogical knowledge and embracing a responsible teaching role. They stressed the significance of thorough preparation, planning, and research before leading a content-focused class in a learning- centered setting. Moreover, Maros et al. (2023) presented a survey result indicating significant student interest in PjBL, with almost all respondents expressing agreement. Given these findings, educators in higher education are encouraged to incorporate PjBL as an alternative approach to teaching and learning activities.

On the other hands, Chien (2019) proposed that integrating PjBL into language teacher education could support pre-service teachers in enhancing their pedagogical skills and bridging the gap between theory and practice. It must be highlighted that it is crucial for pre-service teachers to establish the pedagogical competence. In line with this, Irmawati et al., (2017) stated that pedagogical competence pertains to the knowledge and skills of English teachers in effectively instructing English as a foreign language. This skill set encompasses various capabilities, including designing lesson plans, creating teaching materials and resources, employing effective teaching methodologies to enhance student learning, assessing student progress, and engaging in reflective teaching practices. Moreover, Adegbola and Florence

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(2019) argued that pedagogical competence involved grasping diverse facets, such as lesson planning, establishing structured learning processes, delivering clear instructional explanations, accommodating individual differences, and guiding students in employing effective learning strategies. It can be said that pre-service teachers are supposed to be empowered with both theoretical and practical training to establish these pedagogical competencies.

However, pedagogical knowledge is not the sole requirement for pre-service teachers to succeed in their professional journey. According to Zolfaghari et al. (2022) there is a growing trend towards globalized approaches to teaching, which leads to the need for educational changes, improvements in current teaching practices, and a shift towards learner-centered pedagogy. Considering today's educational trend, there is a growing demand for pre-service teachers to possess proficient knowledge and skills in Information and Communication Technology (ICT) to enhance their teaching efficacy. The integration of technology into teaching practices is increasingly recognized as critical element in modern pedagogy. Recognizing the significance of this aspect, universities are urged to provide targeted training to equip pre-service teachers (PSTs) with adequate digital awareness and competencies. Such competencies are deemed essential for today's pre-service teachers, as they will be tasked with imparting these skills to their future students, alongside subject matter expertise (Global Partnership for Education, 2020).

The incorporation of Information and Communication Technology (ICT) into English teaching and learning is becoming more and more acknowledged as crucial (Waluyo, 2024). Numerous studies have investigated pre-service teachers' pedagogical competence and ICT skills. For instance, Stockless et al. (2022) found that pre-service teachers exhibited varying levels of proficiency with digital tools and their pedagogical integration during school

practicums. Their proficiency with digital tools, particularly those related to office suites, was deemed satisfactory but limited. They perceived themselves as moderately skilled in integrating ICT into teaching. Additionally, Alnasib (2023) emphasized the importance of evaluating pre-service teacher programs to ensure they adequately equip teachers with the essential cognitive, pedagogical, and digital skills required in today's technology-driven era. Similarly, Belda-Medina (2021) explored the attitudes and digital skills of pre-service teachers through ICT-based projects in the EFL classroom. Pre-service teachers showed a positive inclination toward integrating ICTs in the learning process but expressed a need for enhanced training in adopting new technologies.

Considering these issues, the current study focused on how project-based learning strategy facilitates EFL pre-service teacher in incorporating ICT in designing ICT-based classroom instruction design. Thus, the aim is to explore EFL pre-service teachers' perception and experience on the implementation of project-based learning strategy to develop pedagogical competence and how EFL pre-service teachers designing ICT-based classroom instruction.

2. Review of Literature

The English Instructional Technology course has been designed to furnish students with both theoretical insights and practical skills crucial for effective English language teaching. This encompassed comprehension of teaching and communication theories, utilization of media for teaching English as a foreign language, structuring communicative English lessons, and evaluating their efficacy. Given these aims, it was a must for EFL pre-service teachers to enhance their pedagogical competence. According to Zohrabi and Hassanpour (2020) there has been a growing interest in the role of tasks in second/foreign language instruction in recent years. The lecturer opted to

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employ the PjBL strategy. As emphasized by Guo et al. (2020), promoting PjBL among higher education instructors empowered students to explore and actualize their ideas in ways that fostered their innovative competence. More specifically, it encouraged students to learn through problem-solving, questioning, debating, designing, and engaging in peer communication (Choi et al., 2019). Furthermore, PjBL facilitated an environment wherein students could transcend disciplinary boundaries in their pursuit of solutions (Macleod & Veen, 2019).

PjBL constituted an instructional strategy centered on student engagement, aiming to stimulate active and profound learning by involving them in the investigation of real-world problems within a collaborative framework. As elaborated by Bransford and Stein (1984), PjBL represented a comprehensive instructional approach designed to actively engage students in long-term collaborative inquiry. Throughout the teaching and learning process, students collaborated within their groups to successfully fulfill the project assigned by the instructor. Similarly, as noted by Kavlu (2017), a project entailed planning, teamwork, collaboration, systematic evaluation, reflection, production, and presentation. In the English Instructional Technology class, the project assigned by the instructor involved the design of English instructional materials or lesson plans.

Education for pre-service teachers encompasses a training program embedded within the curriculum, covering various educational responsibilities such as teaching practices and related activities. The objective of these endeavors is to equip individuals with the necessary qualifications for pursuing a career in teaching (Jayadi et al., 2022). According to Chan (2016), teacher education holds the potential to significantly enhance the knowledge and skills of pre-service teachers across a broad spectrum, including subject matter expertise, understanding of diverse learners, and

learning styles, and familiarity with various teaching methodologies. Moreover, it has the capacity to shape and refine their pedagogical beliefs. Additionally, it is essential for EFL pre-service teachers to have opportunities for regular reflection on their teaching experiences, enabling the cultivation of tacit knowledge (Arslan, 2019).

In addition to developing pedagogical knowledge, EFL pre-service teachers are also expected to acquire technological proficiency. This proficiency is beneficial for teaching practice or micro-teaching to gain teaching experience. Coşgun (2024) states, micro-teaching is an effective method for pre-service English teachers to gain proficiency in utilizing various technology tools and improve their teaching abilities. Park & Son (2020) asserted that contemporary pre-service teachers are anticipated to possess advanced technological skills surpassing those of previous generations, particularly in utilizing technology for teaching purposes. As stated by Na et al. (2024) digital technology provides distinct educational advantages in terms of resources, teaching and learning methods, and supportive tools like learning management systems. Moreover, many people agree that using digital and information and communication technology methods in the classroom can significantly improve students' educational experiences (Abdullah et al., 2023). In other hand, collaborative learning (CL) further enhances the capabilities and expertise of pre-service teachers by facilitating the exchange of ideas among peers. Chan, et.al. (2021) noted that during CL, pre-service teachers engage in group work, participate in discussions, teach their peers, receive feedback, and engage in group reflection. It is necessary for aspiring teachers to have a firm grasp of these foundational concepts before embarking on their professional journey (Mufidah, 2019).

Digital awareness is essential for enhancing the teaching skills and

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pedagogical competence of future EFL teachers; therefore, the English Instructional Technology (EIT) course is designed to fulfill these needs. Alam and Ogawa (2024) mention, cultivating individuals with strong cognitive abilities and a wide range of practical ICT skills that are easily applicable in professional environments should be the main goal of higher education. Whelan (2005) describes instructional technology as involving problem analysis, solution design, resource development, process implementation, management, and evaluation of instructional methods to optimize knowledge and skill acquisition in educational and professional settings.

Pedagogical competence is a crucial skill set for teachers to excel in their profession. It involves effectively managing student learning processes, which includes understanding students' needs, developing lesson plans, assessing learning outcomes, and fostering student growth (Wardoyo et al., 2020). English teachers are constantly refining their skills in this area, aiming to engage students actively and achieve measurable learning outcomes. Faidal et al. (2020) outlined the various criteria used to assess pedagogical competence, including familiarity with teaching materials, proficiency in teaching methods, classroom management skills, creating dynamic learning environments, and developing instructional materials to aid student comprehension.

Furthermore, pedagogical competence is important not only for individual growth but also for fostering collective advancement within group settings. This pedagogical approach emphasizes guiding the learning process while encouraging active participation, creativity, and curiosity among learners (Arnesson & Albinsson, 2019). Recognizing the collaborative nature of teaching and learning is essential, involving interaction among learners, educators, and curriculum materials. The integration of learning theories

further enhances educators' abilities to fulfill their professional duties (Molla et al., 2023). Moreover, Fabelico and Affala (2023) underscored the critical role of teachers' pedagogical competence in ensuring educational quality, emphasizing its development through personal and professional growth opportunities. Su et al. (2023) advocate for educators to pursue impactful professional development strategies to enhance their pedagogical skills.

To tackle the research problem at hand, we have formulated the following set of research questions: -

1. How is EFL pre-service teachers' perception and experience on the implementation of project-based learning strategy to develop pedagogical competence
2. How do EFL pre-service teachers design ICT-based classroom instruction?

3. Methodology

The research aimed to investigate the impact of Project-Based Learning (PjBL) strategies on EFL pre-service teacher' pedagogical competence in an English Instructional Technology class. The study was conducted as an evaluative case study utilizing qualitative research methods. A case study involves a thorough analysis of current events or situations and is typically conducted for three distinct purposes: descriptive, interpretive, and evaluative (Merriam, 1998). Evaluation studies involve making judgments about what is valuable, with one significant aspect being the assessment of students' academic success (Patton, 2003). Additionally, Stake (1992) outlined the prerequisites for conducting evaluative case studies, which include understanding the case and research subject, examining phenomena and thematic issues related to the research question, gathering various forms of data to construct or validate an argument, employing triangulation of observational data through interpretation, considering alternative interpretations, and formulating generalizations about the case. To ensure the

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accuracy and dependability of this research, the authors employed triangulation method from a variety of data sources, such as: semi-structured interviews, fieldnotes, and learners' diaries. Dobakhti (2020) stated triangulation is a commonly employed method to enhance the internal validity of the research data and findings. Researchers can employ various methods to collect data, such as questionnaires, interviews, classroom observations, and field notes.

3.1 Participants and context

This study was conducted in English education department of Teacher and training education faculty in one of *Private Universities in Pringsewu*, Lampung, Indonesia. The study involves 6 pre-service teachers enrolled in the English Instructional Technology course.

3.2 Data collection and analysis

The data was gathered from semi-structured interview, field notes, and pre-service teachers' learners' diaries. Magaldi and Berler (2020) assert a semi-structured interview, also known as an exploratory interview, is a technique commonly used in research. It focuses on a primary subject and follows a general pattern based on a guide. In this research, semi-structured interviews were given to six participants to provoke their perception and experiences concerning PjBL in English instructional technology class. The data were analyzed via transcription, member verification, and coding after the interview. EFL pre-service teachers as participants were then assigned a code, PST 1, PST 2, PST 3, PST 4, PST 4, PST 6. The interview questions focus on how PjBL impacted them, especially their perceive in pedagogical competence. Moreover, field note was used in doing the observation of the implementation of PjBL in EIT class where the researchers took a note important thing found in the teaching and learning process. The last, from the pre-service teachers' learner diary, the researchers gathered the data regarding on their experience in learning at EIT class through PjBL.

For analyzing the data, the researchers used thematic analysis. Ertmer and Ottenbreit-Leftwich (2010) employed thematic analysis to identify and develop topics, as described by Braun and Clarke (2006). Ertmer and Ottenbreit-Leftwich (2010) declare that teachers' confidence and beliefs in technology integration are influenced by three dimensions or orientations: personal experiences, vicarious experiences, and cultural experiences. In this research, thematic analysis was used by the researchers. The thematic analysis encompassed several steps: transcribing the interviews, thoroughly assessing the data, classifying, and identifying patterns, constructing themes, critically examining, and defining the topics, and finally reporting the findings. During the initial phase of analysis, we acquainted ourselves with the data by transcribing it while simultaneously reading through it. We iteratively analyze the data by annotating the words or sentences that reflect teachers' opinions and confidence. thereafter, we inserted annotations in the comments section to identify and construct potential patterns, and thereafter explicated the outcomes outlined in the findings of this investigation.

4. Results

4.1 EFL pre-service teachers' perception and experience on the implementation of project-based learning strategy to develop pedagogical competence

The study explores how is the implementation of PjBL in English instructional technology class. In this part, we present the results regarding EFL Pre-service teachers' perception and experience on the implementation of PjBL strategy in developing pedagogical competence (See Table) 1

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Table 1*Overview of Theme EFL Pre-service Teachers' Perception and Experiences*

Themes	Sub-themes	EFL pre-service teacher's responses
Perceptions and experiences	Personal perceptions	Understanding on teaching pedagogic The perception on the effectiveness of PjBL The views on learning collaboration
	Personal experience	The challenge in doing the project Believe in PjBL Barriers in doing the project Problem-solving of the project

Personal Perception

We discover that 6 pre-service teachers in this research had positive perceptions on the implementation of PjBL strategy in EIT class. Throughout the teaching and learning process, the lecturer assigned a project to EFL pre-service teachers, requiring them to collaborate in groups to create a learning module or lesson plan. In this case, EFL pre-service teachers should do PjBL stages as determining the project planning the steps to finish the project, arranging the schedule, finishing the project, report and present the project, and evaluate the project and do evaluation.

During these stages, pre-service teachers cultivate their pedagogical knowledge. Collaborating as a team, they engage in all aspects of the project, from project selection and planning to reporting, presenting, and evaluating.

Regarding on EFL pre-service teachers' perceptions on PjBL their responses as follows:

In my mind, PjBL is an effective strategy. I learn how to develop my skills that are needed in daily life, for example; collaboration, communication, and critical thinking to solve the problem. In doing the project, I love discussion with my

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friend to share the idea and collaborate to achieve the goal. For me, collaboration is important since I can learn with the other friends for getting understanding about the lesson. (PST 1)

The participant (PST 1) expressed a positive attitude towards PjBL, describing it as an effective strategy for skill development. He highlighted key skills such as emphasizing the importance of collaboration, communication, and critical thinking, which he/she perceived as essential for real-life applications. The participant particularly valued collaboration, emphasizing the importance of working with peers to share ideas and achieve common goals. This suggested that he/she recognized the value of collaborative learning experiences in enhancing their understanding of lesson content and acquiring new knowledge. In this case, the participant's testimony indicated that he/she viewed PjBL as a valuable approach for fostering skill development and meaningful learning experiences through collaboration and active participation.

The second participant (PST 2), stated:

Project-based learning is fun and not boring. This is an appropriate teaching strategy in English instructional technology class because this learning can be used as a parameter of the students' achievement. PjBL is effective for the students to gain the lesson aims because the students can do the discussion in doing the project. (PST 2)

The second participant (PST 2) also expressed a positive perception of PjBL, characterizing it as enjoyable and engaging, contrasting it with traditional methods that might have been perceived as boring. He/she endorsed PjBL as an appropriate teaching strategy for the English instructional technology class, noting its potential to serve as a measure of students' achievement. The participant highlighted the effectiveness of PjBL

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in helping students achieve lesson aims, attributing this to the opportunities for discussion afforded by project-based activities. This suggested that the participant viewed PjBL as an effective approach for promoting active learning, collaboration, and attainment of lesson objectives and underscored the perceived advantages of PjBL in enhancing student engagement, motivation, and learning outcomes in the English Instructional Technology class.

Based on the learner' diary (April 20th, 2023) PST 2 also mentioned that

“The aspect that we like is when we can choose what topics and learning media we want to study, and from this group project we can discuss in working on group projects. And we can develop new ideas from existing old ideas”.

Related to the above statement, the participant expressed his/her appreciation for the freedom to choose topics and learning media in their studies. He/she found the group project aspect particularly enjoyable, as it allowed for collaborative discussions. Additionally, he/she highlighted the opportunity to generate new ideas from existing ones during group work.

Another participant responds about PjBL from PST 3 also in line with the PST 1 and PST 2, it is highlighted that PjBL strategy is fun and interesting. It also arises the pre-service teaching to think creatively and critically.

I think PjBL is good. It makes the students think creatively and critically in producing product. The team work in PjBL is interesting and fun. In doing the project, we encounter many challenges and barriers but we can solve it together. (PST 3)

PST 3 pointed out that there were some problem and barriers in doing the group project but they can solve them together because pre-service teachers collaborate with the group and use their creativity and critical thinking. The main challenges revolve around beliefs and understanding of PjBL, project design and planning, implementation management, and support. The third

participant expressed a positive opinion of PjBL and considering it beneficial for fostering creative and critical thinking among students during the production process. He/she found teamwork in PjBL to be engaging and enjoyable. Despite encountering various challenges and barriers during project work, the participant highlighted the collaborative effort in overcoming these obstacles.

This is like PST 4's responds below;

What I enjoy when working on a project with my group is being able to work together to complete our project, together thinking about concepts and plans so that our project is completed well. (PST 4)

PST 4 expressed enjoyment in collaborating with their group to complete project tasks. He/she appreciated the opportunity to collectively brainstorm concepts and plans, ensuring the successful completion of their project.

In addition, PST 5 had the following respond:

In PjBL, I can share ideas for working on projects with my friends. I enjoy the process of discussing ideas and working together to achieve common interests. Group work is very enjoyable when we can inspire each other and continue to develop together. (PST 5)

PST 5: The participant described his/her experience in PjBL as enjoyable and collaborative. He/she appreciated the opportunity to share ideas and work together with friends on projects and found the process of discussing ideas and achieving common interests to be fulfilling. He/she particularly enjoyed group work, where they could inspire each other and collectively develop their projects.

The last, the respond of the 6th participant, as follows:

Project-based learning is good for the students to understand the task and material through the project given by the lecturer. During the learning process, I spend more time with a

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group, learning becomes more interesting and relax when doing the assignment (PST 6)

PST recognized the benefits of PjBL in aiding students to comprehend tasks and materials. They found that spending more time with a group during the learning process made assignments more interesting and relaxed. The participant appreciated the interactive and engaging nature of PjBL, which contributed to a positive learning experience.

Personal Experience

The implementation of PjBL in English instructional technology class gives new experiences for pre-service teachers. Concerning on EFL pre-service teachers' personal experience on PjBL, their responses as follows:

I got knowledge about how the process of making systematic learning projects starts from the planning stage, making products and implementing them to students as objects. (PST 1)

PST 1 gained knowledge about the process of creating systematic learning projects, starting from the planning stage to product development and implementation with students as the target audience.

From the project given by the lecturer, I learn a lot about how to be a professional teacher by having pedagogical competence (PST 2)

PST 2 claimed that from the project assigned by the lecturer, the participant learned valuable lessons about becoming a professional teacher by developing pedagogical competence.

The project learning experiences so far have useful in providing guidance in determining maximum learning for students. I enjoy it when students actively participate, pay attention, and are satisfied with the knowledge products I create for them. On the other hand, I do not mind it when some students struggle to adapt to the medium, I choose because I think there are easier options. (PST 3)

PST 3 found their project-based learning experiences to be beneficial in

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guiding them to maximize student learning. He/she enjoyed seeing students engaged and satisfied with knowledge products that meet their needs. Additionally, he/she appreciated when students made efforts to adapt to the selected media, even if they found other options easier.

Through PjBL strategy, pre-service teachers learn both theoretically and practically about the components of pedagogical competence in which they learn how to make systematic learning project. Additionally, pre-service teachers also have valuable experience in designing learning module or lesson plan as the project. In doing this, there are some challenges and barriers but pre-service teachers can solve them well. The students respond regarding these matters as follows:

All the steps in this project are challenging, but we feel so enjoy do this project. I have learned many things from the project which increase my knowledge and understanding on pedagogical competence (PST 4)

The participant 4 found all the steps in the project to be challenging, but he/she thoroughly enjoyed the experience. He/she acknowledged learning many things from the project, which contributed to his/her increased knowledge and understanding of pedagogical competence

I sometime feel that the project is not easy since I should be able to manage our time, but we can overcome this problem my arrange the schedule and do it together (PST 5)

At times, the participant 5 found the project to be challenging, particularly in managing time effectively. However, he reported that he was able to overcome this difficulty by coordinating schedules and working together with his/her team.

In determining the project topic, we work together. Sometime we encounter the barriers like the learning sources but we could find it together and find the solution. (PST 6).

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During the process of determining the project topic, participant 6 and his/her team collaborated. Although they encountered barriers such as difficulties in finding learning sources, they were able to overcome them through teamwork and finding solutions together.

The data revealed several significant findings regarding the impact of PjBL on the preservice teachers' pedagogical competence. In this case, the participants consistently reported that engagement in project activities led to a deeper grasp of pedagogical principles and practices. This indicated that PjBL served as a platform for meaningful learning experiences, where pre-service teachers not only acquired theoretical knowledge but also gained practical insights into effective teaching methodologies. Furthermore, PjBL fostered the development of essential skills crucial for successful teaching. Through collaborative project work, participants reported the enhancement of other skills such as communication, critical thinking, teamwork, and problem-solving. The enjoyment expressed by participants in working together and overcoming challenges underscored the improvement of these skills. Such experiences were invaluable for pre-service teachers as they prepared to enter the dynamic and multifaceted educational circumstances.

Moreover, this finding suggested that PjBL contributed to the professional development of pre-service teachers. By engaging in project activities, participants gained a clearer understanding of the expectations and responsibilities of professional educators. They recognized the importance of pedagogical competence in their future roles and appreciated the guidance provided by project experiences in shaping their professional identity. Additionally, the findings highlighted pre-service teachers' adaptability and resilience in navigating the complexities of PjBL. Despite encountering challenges such as time management issues and barriers in accessing learning resources, participants demonstrated resourcefulness and determination in

finding solutions. This resilience was a valuable attribute that will serve them well in their future careers, where unforeseen challenges were commonplace.

The findings also underscored the shift towards student-centred learning approaches facilitated by PjBL. Participants appreciated the opportunity to set their projects to meet the varied needs and interests of students. This emphasis on student engagement and customization aligned with contemporary educational paradigms that prioritize student agency and empowerment in the learning process. The findings discussed in this section provide a compelling picture of the positive impact of PjBL on the pedagogical competence of pre-service teachers. From deepening knowledge and skills to fostering professional growth and resilience, PjBL was emerged as a transformative educational approach that equipped them with the tools and mindset necessary to thrive in today's dynamic classrooms. These insights underscored the importance of integrating Project-based Learning (PjBL) into teacher education programmes to better prepare aspiring educators for the challenges and opportunities of the teaching profession.

4.2 EFL pre-service teachers integrate pedagogical competence in designing English instruction.

This section, we present the result regarding how EFL pre-service teachers apply pedagogical competence to their project in English instructional technology class (Table 2)

Table 2

Overview of Theme Pre-Service Teachers Apply Pedagogical Competence to Their Project

Themes	Sub-themes	EFL pre-service teacher's responses
Perceptions and experiences	Personal perceptions	Understanding on teaching pedagogic perception on the effectiveness of PjBL The views on learning collaboration

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Pedagogical competences	Personal experience	The challenge in doing the project Believe in PjBL Barriers in doing the project Problem-solving of the project
	Technology	Teaching media
	Pedagogic competence	English instruction/learning module Pedagogical strategies Teaching material

Technology and pedagogical competence

Based on the project given by the lecturer in EIT class, EFL pre-service teachers need to integrate the technology in their learning module or lesson plan. Concerning technology ability and pedagogy content, their responses are as follows:

Technology

- I have learned a lot about how to use technology in learning English, and how to teach well according to the instructions. (PST 1)
- I learned how to create learning materials using existing technology such as YouTube content, videos on Canva, use of AI, etc. (PST 2)
- Of course, many new things have been learned from the English Instructional Technology class, especially the creation of teaching modules and the creation of modified learning materials using technology. (PST 3)
- Thank God, I have gained a lot of knowledge about how to use technology in teaching English, such as knowing applications that can create animations, convert documents into animated ppt form, or in the form of moving videos, and use technology in the form of Google to search for learning information. (PST 4)
- I got a lot from learning EIT, one of which is using technology in learning English, such as making English games as media learning, material in the form of moving videos, and using technology in

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the form of Google for learning. (PST 5)

I learned to make modules, find out which learning media is suitable for material, what kind of learning strategy. (PST 6)

From those responds, pre-service teachers can integrate technology into language learning which explicitly written in their learning module or lesson plan. There are some applications from website or google application store used by pre-service teachers, for example; Canva, video, YouTube, mobile game application and google for learning. It means that pre-service teachers are equipped to teach in this century era when all the new generation are close to the technology.

The first participants' reflections provided valuable insights into their experiences and learning outcomes in the English Instructional Technology class, particularly in terms of integrating technology into English language learning and teaching. Firstly, he/she expressed a significant increase in their understanding of utilizing technology for learning English and teaching effectively, indicating a positive impact of the EIT class on their pedagogical practices. Moreover, the second participant specifically highlighted the acquisition of practical skills in creating learning materials through existing technological tools such as YouTube, Canva, and AI. This demonstrated not only a theoretical understanding but also hands-on experience in applying technology to educational contexts, enhancing their ability to engage students in interactive and multimedia-rich learning experiences. The reflections of the third participant further underscored the breadth of knowledge gained from the English Instructional Technology class, predominantly in the creation of teaching modules and modified learning materials using technology. This suggested that the class effectively covered a wide range of topics connected to instructional technology, equipping participants with versatile skills applicable to various teaching scenarios.

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Besides, the fourth participants expressed gratitude for the newfound knowledge and skills acquired, particularly in utilizing technology for teaching English. He/she cited examples such as creating animations, converting documents into animated presentations, and utilizing Google for learning information. This highlighted the practical utility of the skills learned in the EIT class, empowering participants to explore innovative teaching methods and resources to improve the learning experience for their students. Furthermore, the fifth participants recognized the value of incorporating technology into English language learning through activities such as creating English games and utilizing moving videos as instructional materials. This indicated an appreciation for the diverse possibility technology offers in facilitating language acquisition and engagement among learners. On the other hands, the sixth participants mentioned learning to develop teaching modules and discerning appropriate learning media and strategies, indicating a deeper understanding of instructional design principles and pedagogical approaches. This reflected a holistic learning experience in this course, where participants not only acquired technical skills but also developed critical thinking and decision-making abilities in educational contexts. It can be said that the reflections demonstrated the transformative impact of the course on participants' pedagogical practices, equipping them with the knowledge, skills, and confidence to effectively integrate technology into English language teaching and learning.

Pedagogical Competence

As pedagogical competence as the core purposes of the project that should be achieved by pre-service teachers. There are many activities of the project that increase the pre-service teacher's pedagogical competence. As mentioned, below;

I believe that project-based learning can promote my pedagogical competence because I

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must design and develop projects that are interesting and useful for students, and must pay attention to various aspects of learning, such as language structure, listening, reading, writing, and speaking skills. (PST 1)

Choosing appropriate teaching materials is an important aspect of effective language teaching because it can significantly influence (a) student learning outcomes, (b) level of student engagement, (c) class dynamics and (d) teacher performance. Setting goals, assessing student needs, exploring resources, check material. (PST 2)

I learned to determine the material that will be used as learning media by looking at the curriculum and syllabus. (PST 3)

I learned a lot about making initial planning in learning, namely creating, and compiling learning outcomes first to prepare learning objectives properly and correctly and creating and developing teaching modules. (PST 4)

The thing I should remember is to create an initial lesson plan, it is important to first identify the learning objectives and outcomes you want to achieve in your lesson. (PST 5)

Through this project, I learned that teaching English is through learning-based projects can be an effective and engaging approach to help students develop not only their skill in English language but also critical-thinking skills, problem-solving, collaboration, and communication. (PST 6)

The participant's reflections provide valuable insights into the perceived impact of PjBL on their pedagogical competence and teaching practices. They expressed a belief that PjBL can enhance their pedagogical competence by requiring them to design and develop projects that cater to various aspects of language learning, such as language structure, listening, reading, writing, and speaking skills. The statement reflects a clear understanding of the

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complex aspects of language instruction and the significance of incorporating a wide range of skills and abilities into project design. Moreover, participants also recognized the significance of choosing appropriate teaching materials in effective language teaching, as it can influence student learning outcomes, engagement levels, class dynamics, and teacher performance. This finding highlighted an understanding of the critical role of instructional materials in facilitating effective learning experiences and underscored the need for careful consideration and planning in material selection.

Participants also mentioned learning to determine suitable learning media by aligning with the curriculum and syllabus that demonstrated an appreciation for the importance of curriculum alignment and the need to ensure that learning materials are relevant and supportive of instructional objectives. Furthermore, participants also discussed the importance of initial planning in learning, emphasizing the need to establish clear learning objectives and outcomes before developing teaching which reflected a systematic approach to lesson planning and underscores the significance of goal-setting and alignment in instructional design. Besides, the participants emphasized the advantages of using project-based learning to teach English. They pointed out that it not only improves language skills, but also fosters critical thinking, problem-solving, collaboration, and communication skills. They suggested recognizing the holistic nature of language learning and the importance of experiential and inquiry-based methods in promoting deeper learning outcomes.

5. Discussion

The findings highlight that pre-service teachers have good perceptions and experience that project-based learning strategies are successful in improving pedagogical competence. Pre-service teachers are likely to possess a strong understanding and firsthand knowledge of the effective utilization of

PjBL strategies in English instructional technology. Students can benefit greatly from the learning process by developing important skills such as collaboration, communication, critical thinking, problem-solving, and creativity. Capraro et al. (2013) explicate engaging in project-based learning that encourages extensive communication and collaboration throughout the projects is a highly effective method for enhancing communication and collaboration skills. Moreover, Chiu (2020) asserted that Meng, et al; (2023) found that implementing PBL can be quite challenging, as it requires careful planning and execution. In addition, Neches, et al. (2020) said in this sense, the students engage in collaborative work for all the assignments, including data analysis, information gathering, report writing, and oral presentations. They aim to assess the given problem or challenge and draw their own conclusions. The last, on the report of Alrajeh (2021) assisting students in acquiring knowledge from their peers is widely regarded as the fundamental element of Project-Based Learning (PjBL). Students engage in collaborative discussions in PjBL, where they respectfully debate, exchange ideas, make comparisons, and recognize connections. Through this process, they enhance their social, communication, listening, and response skills. In addition, according to Kos (2024) one of the main advantages of collaborative tasks or activities is that they provide opportunities for language practice and reinforce previously learned material.

Regarding the pedagogical competence within the context of English Instructional Technology, by implementing the PjBL pre-service teachers can combine the pedagogical content and technology in their project. Based on the responds from pre-service teachers, they can design learning module or lesson plan, use pedagogical strategies and teaching media which integrated with the technology. It means that PjBL strategy is effectively implemented in English instructional technology class.

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This finding is in line with the research conducted by Tsbulsky and Rozanov (2021) the findings indicate that the individuals involved in the pre-service program identified themselves as individuals who are actively working towards enhancing their teaching skills to effectively implement PjBL in their classrooms. It was discovered that the pre-service teachers' competence was positively influenced by a greater number of positive perception and emotional experiences which bring benefits for their pedagogical development.

6. Conclusion

This evaluative case study offered a new insight into the positive impact on PjBL to students' perception and experience in EIT class. Pre-service teachers appreciate all the process of PjBL implementation, such as; determining the project, planning the steps to finish, report, present, and evaluate the project. These precious experience impacts on pre-service teacher's understanding on teaching pedagogic, the perception on the effectiveness of PjBL, the views on learning collaboration, the challenge in doing the project, believe in PjBL, and the ability to overcome barriers in doing the project. Concerning about how EFL pre-service teachers apply pedagogical competence to their project, based on this study, they can integrate their pedagogical competence and technology skill in doing the project. In their learning module or lesson plan, they have integrated technology as the teaching media, they can use pedagogical strategies and design teaching material.

The study highlights significant implications with respect to pre-service teachers' education program in EFL settings. In conclusion, PjBL provides evidences of its impact on pre-service teachers' perception and personal experience. These impacts give good advantages for pre-service teachers in improving their pedagogical competence and ICT skills.

7. Limitations and Further Research

The limitation of this study is that the discussion of EFL pre-service teachers' perception and experience on the implementation of Project-based learning in developing pedagogical competence especially in designing ICT-based classroom instruction design. This gives the chance for future research to explore additional aspects of ICT-based classroom instructional design in large-scale of Education setting.

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Reference

- Abdullah, H., Sahudin, Z., Bahrudin, N. Z., Bujang, I., & Khalid, K. (2023). Determinants of educational technology acceptance: An integration of TAM and UTAUT. *Asian Journal of University Education*, 19(4), 638-650. <https://doi.org/10.24191/ajue.v19i4.24626>
- Adegbola & Florence, F. (2019). Teachers' pedagogical competence as determinants of students' attitude towards basic science in South West Nigeria. *Educational Research and Reviews*, 14(18), 655-660. <https://doi.org/10.5897/ERR2019.3761>
- Alam, M. J., & Ogawa, K. (2024). Future-readiness and employable ICT skills of university graduates in Bangladesh: an analysis during the post-covid era. *Cogent Social Sciences*, 10(1), 2359014. <https://doi.org/10.1080/23311886.2024.2359014>
- Almulla, M.A. (2020). The Effectiveness of the project-based learning (PBL) approach as a way to engage students in learning. *SAGE Open*, 7(9), 1-15. <https://doi.org/10.1177/2158244020938702>
- Alnasib, B. N. (2023). Digital competencies: Are pre-service teachers qualified for digital education? *International Journal of Education in Mathematics, Science and Technology*, 11(1), 96-114. <https://doi.org/10.46328/ijemst.2842>
- Arnesson, K., & Albinsson. (2019). Reflecting talks: a pedagogical model in learning organization. *Reflective practice*, 20(2), 234-249. <https://doi.org/10.1080/14623943.2019.1575198>

ICT-based classroom ...

- Arslan, F.Y. (2019). Reflection in pre-service teacher education: exploring the nature of four EFL pre-service teachers' reflections. *Reflective Practice*, 1-14. <https://doi.org/10.1080/14623943.2018.1564652>
- Belda-Medina, J. (2021). ICTs and project-based learning (PBL) in EFL: Pre-service teachers' attitudes and digital skills. *International Journal of Applied Linguistics & English Literature*. 63-70. <http://dx.doi.org/10.7575/aiac.ijalel.v.10n.1p.63>
- Bransford, J.D., & Stein, B.S. (1984). *The ideal problem solver. A guide for improving thinking, learning, and creativity. A series of books in psychology*. W.H. Freeman.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Capraro, R.M., Capraro, M.M., & Morgan, J.R. (2013). STEM project-based learning an integrated science, technology, engineering, and mathematics (STEM) approach. *Springer Science & Business Media*. <https://doi.org/10.1007/978-94-6209-143-6>
- Chan, S., Maneewan, S., & Koul, R. (2021). Cooperative learning in teacher education: its effects on EFL pre-service teachers' content knowledge and teaching self-efficacy. *Journal of Education for Teaching*, 1-14. <https://doi.org/10.1080/02607476.2021.1931060>
- Chan, W. L. (2016). The discrepancy between teachers' beliefs and practices: a study of kindergarten teachers in Hongkong. *Teacher Development*, 20, 417-433. <https://doi.org/10.1080/13664530.2016.1161658>
- Chien, C.W. (2019). Influence of problem-based learning (PBL) on Taiwanese elementary school pre-service English teachers' pedagogical content knowledge. *International Journal of Primary, Elementary and Early Years Education*, 3(13), 1-15. <https://doi.org/10.1080/03004279.2019.1633373>
- Chiu, C.F. (2020). Facilitating K-12 teachers in creating apps by visual programming and project-based learning. *International Journal of Emerging Technologies in Learning (iJET)*, 15(01), 103. <https://doi.org/10.3991/IJET.V15i01.11013>
- Choi, J., Lee, J.H., & Kim, B. (2019). How does learner-centered education affect teacher self-efficacy? The case of project-based learning in Korea. *Teaching and Teacher Education*, 85, 45-57. <https://doi.org/10.1016/j.tate.2019.05.005>
- Coşgun, G.E. (2024). Reshaping teacher training: insights from pre-service english teachers' online micro teaching experiences. *Teaching English Language*, 18(1), 159-176. <https://doi.org/10.22132/tel.2024.450276.1583>

- Dobakhti, L. (2020). The process of enhancing validity, reliability, and ethics in research. *Iranian Journal of Applied Language Studies*, 12(2), 59-88. [10.22111/IJALS.2020.5978](https://doi.org/10.22111/IJALS.2020.5978)
- Elmahdi, O. E. H., AbdAlgane, M., & Othman, K. A. J. (2024). Promoting inclusion and motivation in efl learning: strategies for success. *Teaching English Language*, 18(1), 127-158. <https://doi.org/10.22132/tel.2024.429625.1542>
- Ertmer, P.A., & Ottenbreit-Leftwich, A.T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255-284. <https://doi.org/10.1080/15391523.2010.10782551>
- Fabelico, F.L., & Afalla, B.T. (2023). Revisiting the curriculum: Insights from pedagogical competence and academic performance of preservice teachers. *Cogent Education*, 10(2), 1-12. <https://doi.org/10.1080/15391523.2010.10782551>
- Faidal, N.F., Nur, R., & Suriani, S. (2020). The teachers' pedagogic competence in teaching English through online and offline setting. *English Language Education Program*, 7(1), 41-53. <https://doi.org/10.26858/eltww.v7i1.13294>
- Global Partnership for Education. (2020). 21st-Century skills: What potential role for the global partnership for Education? A landscape review. GPE
- Gomez, R.L.F. (2017). Learning by teaching: Training EFL pre-service teachers through inquiry-based learning. *Electronic Journal of Foreign Language Teaching*, 14(1), 21-36. <https://e-flt.nus.edu.sg/wp-content/uploads/2020/09/gomez.pdf>
- Guo, P., Saab, N., Post, L.S., & Admiraal, W. (2020). A review of project-based learning in higher education: student outcomes and measures. *International journal of Education Research*, 102, 1-13. <https://doi.org/10.1016/j.ijer.2020.101586>
- Hanak, A.N. (2021). Project-based learning at the university-level: example of application to a course on French for tourism and hospitality. *Electronic Journal of Foreign Language Teaching*, 18(1), 74-89. <https://doi.org/10.56040/abhn1815>
- Irmawati, D.I., Widiati, U., & Cahyono, B.Y. (2017). How do Indonesian professional English teachers develop their pedagogical competence in teaching implementation. *Arab World English Journal*, 8(2), 293-307. <https://dx.doi.org/10.24093/awej/vol8no2.21>
- Jayadi, R.F., Adi, S.S., & Gozali, A. (2022). Classroom management problems faced by pre-service teachers of English education program in senior high schools. *Education of English as Foreign Language Journal (EDUCAFL)*, 5(1), 20-27. <https://doi.org/10.21776/ub.educafl.2022.005.01.03>

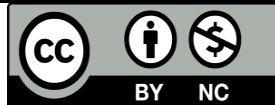
ICT-based classroom ...

- Kavlu, A. (2017). Implementation of project-based learning (PBL) in EFL (English as a foreign language) classrooms in Felazar educational institution (Iraq). *International Journal of Social Sciences & Educational Studies*, 4(2), 67-79. <https://doi.org/10.23918/ijsses.v4i2sip67>
- Kos, T. (2024). Enhancing young learners' collaboration through tasks—what can language pedagogy learn from research? *The Electronic Journal for English as a Second Language*, 28 (2), 1-20. <https://doi.org/10.55593/ej.28110a2>
- MacLeod, M., & Veen, J.T.V.D. (2020). Scaffolding interdisciplinary project-based learning: a case study. *European Journal of Engineering Education*, 45(3), 363-377. <https://doi.org/10.1080/03043797.2019.1646210>
- Magaldi, D., & Berler, M. (2020). Semi-structured interviews. In: Zeigler-Hill V., Shackelford, T., K (Eds). *Encyclopedia of Personality and Individual Differences*. Springer. https://doi.org/10.1007/978-3-319-24612-3_857
- Maros, M., Korenkova, M., Fila, M., Levicky, M., & Schoberova, M. (2023). Project-based learning and its effectiveness: evidence from Slovakia. *Interactive Learning Environments*, 31 (7), 4147-4155. <https://doi.org/10.1080/10494820.2021.1954036>
- Meng, N., Dong, Y., Roehrs, D., & Luan, L. (2023). Tackle implementation challenges in project-based learning: a survey study of PBL e-learning platforms. *Educational Technology Research Development*, 71, 1179-1207. <https://doi.org/10.1007/s11423-023-10202-7>
- Meriam, S. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Molla, A., Yayeh, M., & Bisaw, A. (2023). The current status of faculty members' pedagogical competence in developing 21st century skills at selected universities in Ethiopia. *Cogent Education*, 10(2), 1-15. <https://doi.org/10.1080/2331186X.2023.2228995>
- Mufidah, N. (2019). The development of pre-service teachers' teaching performance in the teaching practice program at English department of state Islamic university of Antasari Banjarmasin. *Dinamika Ilmu*, 19(1), 97-114. doi: <http://doi.org/10.21093/di.v19i1.1469>
- Na, M., Jill, L. S. S., Noor, H. M., Qi, F. J., & Ying, W. (2024). A pre-service art teacher digital literacy framework for digital literacy in pre-service art teacher education in China. *Asian Journal of University Education*, 20(2), 235-247. <https://doi.org/10.24191/ajue.v20i2.27007>
- Neches, B.D.L.T., Avi, M.R., Herguedas, J.L., & Medina, J.R. (2020). Project-based learning: an analysis of cooperative and evaluation as the axes of its dynamic. *Humanities & Social Sciences Communications*, 7(167), 1-7. <https://doi.org/10.1057/s41599-020-00663-z>

- Park, M., & Son, J.B. (2020). Pre-service EFL teachers' readiness in computer-assisted language learning and teaching. *Asia Pacific Journal of Education*, 1-16. <https://doi.org/10.1080/02188791.2020.1815649>
- Patton, M. Q. (2003). *Qualitative research & evaluation methods*. Sage.
- Pusztai, K.K. (2021). Evaluation of project-based learning. *Acta Napocensia*, 14(1), 64-75. <https://dx.doi.org/10.24193/adn.14.1.5>
- Stake, R.E. (2006). *Multiple case study analysis*. The Guilford Press.
- Stockless, A., Villeneuve, S., Bisailon, J., Fournier, F., & Venant, F. (2022). Pre-service teachers' competence and pedagogical use of ICT: Are they ready to develop collaborative activities with students? *Computer in the Schools*, 39(3), 203-229. <https://doi.org/10.1080/07380569.2022.2071223>
- Su, Y. R., Musarokah, S., & Tristiana, N. E. (2023). Bridging the challenges and opportunities of EFL teachers' professional development through digital competencies. *English Language Education Journal (ELEJ)*, 2(1), 44-61. <https://doi.org/10.36928/elej.v2i1.1811>
- Tsybulsky, D & Rozanov, Y.M. (2021). Project-based learning in science-teacher pedagogical practicum: the role of emotional experiences in building preservice teachers' competencies. *Disciplinary and Interdisciplinary Science Education Research*, 3(9), 1-12. <https://doi.org/10.1186/s43031-021-00037-8>
- Waluyo, B. (2024). Technology-Fused English Teaching and Learning in Higher Education: From Individual Differences to Being Different Individuals. *LEARN Journal: Language Education and Acquisition Research Network*, 17(2), 42-47. thaijo.org/index.php/LEARN/article/view/274071
- Wardoyo, C., Satrio, Y., & Ratnasari, D. (2020). An analysis of teachers' pedagogical and professional competencies in the 2013 curriculum with the 2017-2017 revision in accounting subject. *REiD (Research and Evaluation in Education)*, 6(2), 142-149. <https://doi.org/10.21831/reid.v6i2.35207>
- Whelan, R. (2005). *Instructional technology and theory: A look at past, present and future trends*. NY.
- Yin, R. (2018). *Case study research: design and methods*. Sage Publications
- Zhang, D & Wang, W. (2023). The current status and development of pre-service language teachers' TLLT competence in a PJBL classroom. *Teacher Education & Development*. 10(2), 1-19. <https://doi.org/10.1080/2331186X.2023.2273174>
- Zohrabi, M. & Hasanpour, S. (2020). The effect of open vs. closed tasks on Improving Iranian EFL learners' oral performance. *Teaching English as a Second Language Quarterly*, 38(4), 205-238. <https://doi.org/10.22099/jtls.2020.37075.2814>

ICT-based classroom ...

Zolfaghari, S., Ashraf, H., Khodabakhshzadeh, H., & Zareian, G. (2022). Examining learner-centred pedagogy and assessment practices in teacher training program at universities of Iran: Investigating teachers' and students' attitudes. *Teaching English Language*, 16(1), 235-259. <https://doi.org/10.22132/TEL.2022.151498>



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