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# A Reflection Based-Program to Enhance Student Teachers' EFL Teaching Performance and Decrease their Cognitive Load

by
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## Abstract

The current study aimed to examine the impact of a reflection-based program on enhancing specific teaching performance skills and decreasing the cognitive load of third-year student teachers in the English Language Department at the Faculty of Education, Damietta University. A one-group pre-posttest design was employed. Teaching performance skills were identified using various tools during the data collection and diagnostic phase, including a checklist approved by a jury of EFL specialists. The program focused on improving five core teaching performance skills: Pedagogical competence, teacher-student interaction, delivering lessons, assessment knowledge, and language of instruction. A randomly selected group of thirty-two participants received the reflection-based program in the 2023-2024 academic year. Reflective tools such as unstructured reflection interviews, written reflective journals, audio reflective journals, recorded reflective video, and peer feedback meetings, instructor feedback meetings, and Cognitive Load Scale were employed to capture different aspects of participants' reflective practices and teaching experiences. Additionally, a cognitive load scale was used to assess and decrease participants' cognitive load. A pre-post application was administered to measure the development of teaching skills. The results indicated that the reflection-based program was effective in enhancing teaching skills and decreasing cognitive load.
**Key words:** Reflection-Based Program, Student Teachers, EFL Teaching Performance, Cognitive Load.

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## Introduction

Teaching is a dynamic, interactive, and engaging process. It fosters knowledge, skills, and values in students. However, teaching is a complex profession that requires expertise, flexibility, and careful planning. to enhance educational quality and achieve desired learning outcomes. Teachers need these skills to improve education quality and reach learning goals. Teachers have to assess and revise their teaching practices, adjusting content and materials to align with their students' learning needs and preferences. The practicum serves as an academic setting, process, and experience, and it is a key component of an undergraduate program in EFL. It fulfills various objectives aimed at fostering practical knowledge. Practicum requires student-teachers to perform a series of demands (must-be and must-do). In addition, it requires reflection, construction of knowledge, and knowing language teaching (Lucero, Gamboa-González & Cuervo-Alzate, 2024).

Moreover, teachers must adopt, innovate, and introduce new methods to their teaching approaches (Djoub et al., 2018). In today's changing education field, it is crucial for teachers, especially student teachers, to keep abreast of changes in teaching and learning processes. Therefore, Deocampo (2020) suggests that teachers' learning, and development begin with their pre-service teacher education program and developing classroom experience.

According to Rahmawati, Miftakh, and Al-Baekani (2021), the teaching practicum is one of the most essential elements since it permits pre-service teachers to be involved in real-world classroom settings. The practicum's major goal is to provide pre-service teachers with practical teaching experiences and activities that will help them acquire the skills they need to become professional educators. However, during this program, they may face a variety of problems. They might struggle to apply their knowledge and balance personal, emotional, and professional values. These emotional changes can affect their sense of professional identity. Thus, supporters of teacher education argue that to succeed, new teachers must learn to reflect on their practices. This is particularly

important when it comes to designing lessons, delivering instruction, and understanding the unique needs of each student (Fuller, 2018).

Iqbal and Ali (2024) stated that the practicum is an important stage for future teachers to develop their teaching skills. It allows them to apply what they have learned in real classroom situations. However, many future teachers reported feeling unsure of themselves and hesitant to teach, often starting and ending their lessons abruptly. They also had trouble engaging students and failed to encourage active participation throughout the lesson. Nevertheless, the ability to reflect on their practice is essential for their professional growth, as it helps them identify areas for improvement and find ways to become better teachers.

Researchers have been interested in student teachers' performance, even during COVID-19. Tharwa (2021) studied how the university's staff and students at Majmaah University were satisfied with distance learning for practicum training. Using a quantitative approach, the study measured the impact of distance learning on students by giving a test before and after the practicum. An online survey was sent to thirty staff members and fifty students to assess their satisfaction with practicum methods during the pandemic. The study results confirmed its goals, showing students' scores improved after the practicum. Students also preferred a mixture of in-person school training and distance learning, with positive feedback on this blended approach.

**Literature Review**

**Teaching Performance and Practicum**

Teaching Practicum is a vital stage in becoming a teacher. English teachers really need to go through this training to succeed in their careers. To teach English effectively, teachers should build a solid knowledge base that helps students in their journey of lifelong learning. Future teachers are encouraged to think reflectively, which helps them grasp classroom dynamics and discover what works best. English teachers, especially, face many challenges because of the competitive global market for English education and the high demands of the teaching profession (Deocampo, 2020).

This notion parallels the views of Malikebu, McDonald, and Jordaan (2024), who believe that the teaching practicum holds a critical role in teacher education programs, serving as the final experience in teacher preparation. It provides novice teachers with the opportunity to practice in real classroom settings and facilitates their socialization into the teaching profession. Numerous studies have explored the interconnected relationships within the practicum, as well as various methods of

assessing student teachers' progress and performance during this essential phase.

Hence, García-Noblejas, Barceló-Cerdá, Rodríguez-Gómez, and López-Gómez (2023) conducted a cross-sectional study to explore student teachers' perceptions of the benefits of teacher education practicums, involving 455 students in Early Childhood and Primary Education Degrees at a university in Madrid. Data was collected through a questionnaire administered at the end of practicum periods from the second to fourth year. The findings revealed that the practicum period significantly affects student satisfaction, with lower scores during the intermediate practicum. Gender also influenced perceptions, although inconsistent, while results related to the degree were stable due to coordinated practicum management across programs. The study emphasizes the importance of enhancing awareness of practicum benefits and suggests reinforcing the educational potential of the intermediate practicum. It calls for improved coordination between universities and schools. It highlights the vital role of school mentors. The authors advocate for further research to improve the practicum experience for future educators.

Malikebu, McDonald, and Jordaan (2024) confirm the success of the teaching practicum depends on several factors. These factors are adherence to the established standards for assessing student teachers and placing them in schools under a university-school partnership model. Two key relationships are central to this experience: the mentor-student teacher dynamic and the relationship between teacher educators and student teachers. Both relationships are essential in evaluating and shaping teaching practices. These interactions are pivotal for guiding and improving the practicum professional growth and reflective practice.

Teaching practice encompasses various critical aspects, including classroom management and content knowledge. Young et al. (2018) found that behavior management significantly influenced how pre-service teachers viewed their success, particularly in boosting student engagement. In a study of 1,490 pre-service teachers from eleven Canadian universities, the researchers discovered that effective behavior management heightened the teachers' sense of self-efficacy during their practicum. The participants felt more accomplished when they could help students manage their behavior. The study, which used questionnaires, revealed that behavior management was the primary factor in boosting pre-service teachers' confidence, regardless of the challenges they faced, especially when preparing them for inclusive classrooms.

In his study El-Sawy (2018) revealed a significant gap between what preservice English teachers learn in their training courses, their understanding of effective teaching, and their actual teaching practices. This discrepancy was evident in almost all teaching aspects, such as vocabulary presentation, skill development, student engagement, and the use of native language in EFL classes. In some cases, preservice teachers aligned their views of effective teaching with what they had learned in their courses, suggesting that a few were theoretically convinced by the content of their teacher preparation programs.

## Teaching Performance and Reflection

The issue of reflection has become one of the crucial components of teachers' professional development (Riyanti, 2020). Many studies have explored both individual and collective reflection. Solheim, Roland, and Ertesvåg (2018) studied how Norwegian secondary school teachers perceive their own learning individually and as a group in classroom interactions. Involving seventy-six teachers across fourteen schools, data from focus group interviews and teacher logs revealed that teachers primarily learned individually through self-reflection and experience sharing, while collective learning was less structured and relied on school leaders for guidance. Key factors influencing development include time, structured work, and effective leadership. The study concluded that combining individual and group learning enhances both teacher growth and overall school improvement, with principals playing a vital role in supporting this process.

In addition, Djoub et al. (2018, xvi) assert that there is pressing need for teacher education programs to support pre-service teachers to reflect effectively on their profession to improve their pedagogical skills in the 21st century global classroom. Indeed, today's mission for teacher education goes beyond preparing future teachers to develop classroom instructional practices. It aims to help them become more reflective practitioners who are engaged, critical and ready to make changes, innovative and focused on achieving their professional development. Student-teachers' reflection should inform the various tasks they participate in, such as planning lessons, providing instructions, managing classrooms, selecting materials, integrating technology, assessing students, providing feedback, collaborating with colleagues. Reflection thus needs to be the core component of pre-service teacher training programs and the intended goal upon which plans and decisions are made.

Riyanti (2020) argues that the concept of reflection or reflective practice is not new in the field of teaching and education. In 1933, Dewey is often credited as the first to introduce the term "reflection". He described it as an active process of self-examination aimed at improvement. For some researchers, reflection can simply mean thinking about something, but it can also have a more specific meaning that involves taking action based on that thought. Riyanti notes that numerous scholars have investigated the impact of reflection on teaching techniques, evaluating diverse formats such as written reflections, audio recordings, and video recordings. These findings highlight the importance of reflective techniques in improving teaching effectiveness and professional growth. Reflective practices allow teachers to obtain deeper insights into their teaching approaches and enhance their instructional strategies.

Similarly, in a narrative inquiry study by Deocampo (2020) investigated the challenges faced by fifteen English teacher trainees during their practicum. Data from reflection papers and semi-structured interviews, using convenience sampling, revealed several key difficulties: classroom management, employing effective teaching and learning strategies, overcoming communication barriers, possessing sufficient vocabulary, lesson planning, teacher appraisal, and motivating students. The researcher suggests that reflecting on these challenges helps trainees become better English teachers by encouraging self-assessment and growth, leading to their success.

Novozhenina and López (2018) conducted a professional development program project aimed at enhancing English as a foreign language (EFL) teachers' teaching practices and self-reflection in Manizales, Colombia. Initially, surveys, classroom observations, and document analysis were used to identify teachers' professional needs and areas for improvement. During the action phase, the researchers used class observations, informal discussions, and a survey to assess the impact of the program. The results showed that while the program led to some improvements in teaching performance and self-reflection, there was still room for further training and development.

In his findings, Park (2022) emphasized the importance of reflectivity for both self-reflection by pre-service teachers and reflection by instructors. He argued that pre-service teachers should reflect on their teaching practices in order to integrate theoretical knowledge into their skills in the classroom. Additionally, he focused on the reflective thinking of pre-service teachers, categorizing their reflectivity into four patterns:

describing, informing, conforming, and reconstructing. Results indicated that the pre-service teachers prioritized content over teaching models or frameworks. This suggests a lack of strategic thinking in their lesson planning and insufficient understanding of instructional and theoretical foundations. Park's findings highlight the need for pre-service teachers to focus not only on content but also on pedagogical strategies and reflective practices. For him, these factors are essential for their development as effective educators.

Kharlay, Wei, and Philips (2022) explored how reflective practice is applied in English language teaching (ELT) in Ukraine. They apply a survey on 56 English as a Foreign Language (EFL) teachers. They used both questionnaires and interviews to gather data. The findings indicate that while Ukrainian EFL teachers regularly engage in reflective practice, they do so inconsistently. The study points out a significant difference in understanding reflective practice between experienced and novice teachers, suggesting that teaching experience is crucial for effectively using reflection to enhance skills. Teachers generally prefer peer sharing and observations over journaling or organized notetaking, as they believe that these methods are too time-consuming during their busy schedules. They recommend that regular training on reflective strategies be provided for in-service teachers. This could offer them opportunities for professional development at both the school and national levels.

As for using videos as a reflective tools used by student teachers, Park (2022) states that video recordings have become useful in self-critiquing and reflect on their teaching behaviour. Briefly, self-critiquing confronting reflectivity enables preservice teachers to reflect on their teaching practices and restructure the teaching sequence in their performance.

## Teaching Performance and Cognitive Load

Cognitive Load Theory (CLT), coined by John Sweller in 1988, suggests that our working memory has a limited capacity and can only hold a small amount of information at a time. According to Sweller, cognitive load refers to the total mental effort being used in working memory during tasks like learning, reasoning, and problem-solving. To optimize learning, instructional methods should avoid overwhelming this capacity. Therefore, managing this load is crucial for improving how well we process and retain information (Sweller,1988). Teaching practices directly affect cognitive load by either making it easier or harder for students to process information. CLT explains the load a person experiences in receiving information while learning.

Timothy, Fischer, Watzka, Girwidz, and Stadler (2023) studied a rating scale to measure cognitive load in pre-service teacher education with eighty-one undergraduate students in a science program. The participants were divided into three groups: problem-solving, example-based learning, and a control group. The study assessed cognitive load during an intervention aimed at exploring the influence of instructional design on cognitive load. The results indicated that all three types of cognitive load could be reliably measured. Instructional designs that enhance germane cognitive load improved diagnostic skills in pre-service teachers, while designs leading to irrelevant cognitive load hindered their development. This highlights the need to consider cognitive load in designing pre-service teacher education programs for better learning outcomes. Additionally, measuring cognitive load provides valuable insight into how instructional design or learning tasks affect learners' processing and retention of information. It can also aid in developing effective instructional strategies that optimize cognitive resources (Sweller, 2018).

Permana, Firman, Redjeki, and Hamidah (2019) conducted a study to examine the cognitive load of pre-service teachers, focusing on the effectiveness of teaching strategies based on Cognitive Load Theory. The study explored the relationship between Intrinsic Cognitive Load (ICL) and Extraneous Cognitive Load (ECL). The teaching strategy developed followed stages including Introduction, Reflection, Visualization, Application, Recitation, and Evaluation. The participants consisted of thirty-one pre-service teachers from Indonesia. ECL data were gathered through a task complexity assessment that involved a short question designed to measure information analysis skills during lectures, while a 7-point scale questionnaire measured the mental effort of the participants. The results showed that the implemented lecture strategy successfully increased ICL and decreased ECL. The strategy resulted in low mental effort during the introduction stage, with a gradual increase in mental effort during the application stage.

Sweller (1988) identified three types of cognitive load: intrinsic, extraneous, and germane. Intrinsic cognitive load refers to the inherent complexity of the material being learned, which varies depending on the difficulty of the task. Extraneous cognitive load is influenced by how information is presented, and poor instructional design can unnecessarily increase this load. Germane cognitive load involves the mental effort dedicated to understanding and integrating new information, which is essential for learning and developing knowledge structures. Effective

learning requires managing these cognitive loads to optimize understanding and retention.

Similarly, Permana, Firman, Redjeki, and Hamidah (2019) describe these three types of cognitive load in their work on cognitive load theory (CLT). They explain that intrinsic load relates to the content of the materials presented, mirroring Sweller's concept of inherent complexity. Extraneous load, as they highlight, refers to the way the material is presented, aligning with Sweller's point about poor instructional design raising unnecessary load. Germane load, identified by both Sweller and Permana et al., involves the cognitive effort necessary for understanding the material. Together, these insights underscore the significance of recognizing and managing cognitive load in educational settings to enhance learning outcomes. Consequently, CLT proposed by Taylor et al. (2022) outlines three cognitive components that constitute the architecture of human learning as follows: Sensory Memory, Working Memory, and Long-Term Memory.

Both studies by Permana, Firman, Redjeki, and Hamidah (2019) and Taylor et al. (2022) explore CLT, but they focus on different situations. Both studies show that CLT is important for helping students learn. Permana et al. focus on improving teaching strategies in a classroom, while Taylor et al. expand the theory to deal with external stresses, especially during tough times like the pandemic. Together, they show how managing the amount of information and stress can make learning more effective. However, they share a common goal: helping students learn more effectively by managing the amount of information their brains have to process. Both studies use CLT, which breaks down the learning process into three types of cognitive load as follows:

1. **Intrinsic Load**: This is the difficulty of the material itself. Permana et al. worked with future pre-service teachers and found that their strategy helped improve Intrinsic Load by making sure students better understood the content through steps like practice and reflection. Taylor et al. also talk about Intrinsic Load, explaining that it's important to manage this during hard times, like the pandemic, when learning can already be difficult due to complex material.

2. **Extraneous Load**: This is the unnecessary mental effort caused by how the information is presented. Permana et al. tried to lower the unnecessary Extraneous Load by organizing lessons in a way that did not overwhelm students, especially at the start of learning.

3. **Germane Load**: This is the mental effort put into understanding and learning the material. Taylor et al. took this further by

including psychological stress (like anxiety from the pandemic) as part of Extraneous Load, showing that reducing distractions and stress can help students focus better on learning. Taylor et al. highlighted that Germane Load should be increased by creating activities and tools that help students actively learn and organize information, especially in an online setting during the pandemic.

Accordingly, Li, Xie, and Zeng (2023) explored the impact of the EFL teaching practicum on pre-service teachers' anxiety. The study used teaching anxiety scale and interviews to compare anxiety levels between pre-service teachers with and without practicum experience. Findings showed that pre-service teachers experienced moderately high anxiety overall, with the practicum group showing significantly higher anxiety. Female teachers consistently exhibited more anxiety than male teachers. Key sources of anxiety included fear of negative evaluation, low self-perception of language proficiency, and teaching inexperience

Instructional design should reduce unnecessary cognitive load, known as extraneous load. It should also enhance the useful cognitive load for learning, called germane load. Additionally, CLT emphasizes acknowledging the essential cognitive load, or intrinsic load, that comes with the material's complexity. Therefore, reducing unnecessary demands on working memory allows learners to focus better. This frees up cognitive resources for building and automating knowledge structures, resulting in more effective learning (Sweller, 1988).

In the Arab educational landscape, research has emphasized various aspects of teaching performance during the practicum for student teachers. In KSA        Alsamadani (2017) aimed to identify the challenges faced by Saudi female EFL student-teachers during their one-semester teaching practicum and how they dealt with these issues. The study, involving eighty-one participants, revealed that most problems arose from the students' academic levels, the student-teachers' teaching skills, and difficulties with school administration. It suggested that strategies to address these challenges should be included in teacher preparation programs. The study also recommended shifting to a clinical model for teacher training, where teaching is viewed as a complex practice requiring collaboration among student-teachers, supervisors, staff, administrators, and families.

In Libya, Al Sharif (2019) emphasized the importance of teaching practice in preparing student teachers. His study examined the challenges faced by English Department students at the University of Tripoli during their practicum, including issues in classroom management. Findings

suggested that more cooperation among school stakeholders is needed to support student teachers. The study recommended extending the practicum from one semester to a full year to give students more classroom experience. The study recommended extending the teaching practice period from a semester to a year in order to provide students with additional time in the classroom.

In a more recent study, Ibrahim (2021) explored the perceptions of Saudi EFL female student-teachers regarding key aspects of their teaching practicum. It  includes elements like cooperating teachers, university supervisors, host schools, and the practicum itself. The study surveyed forty-four pre-service students who completed field training in government schools in Al-Madinah Al-Munawarah. A 60-item Likert-scale questionnaire, divided into four categories, was used to gather their views on each component of the training. The findings revealed that the student-teachers had positive perceptions and appreciation of all aspects of their practicum. Furthermore, cooperating teachers and university supervisors were seen as playing important roles in helping the student-teachers enhance their teaching skills and performance. Constructive feedback from both the university supervisors and cooperating teachers was found to positively impact the student-teachers' overall teaching performance.

In the Egyptian teaching environment, El-Sawy explains that (2018) in Egypt, students in the English department at colleges of education receive both academic and professional training. The program lasts four years, with two semesters every year. Academically, students improve their English skills by taking courses in literature, linguistics, and language skills. Professionally, they study TEFL 1, TEFL 2, and teaching practice, as well as basic teacher preparation subjects like educational psychology.

Similarly, in Egypt, El-Maleh (2021) conducted a study to assess the existing Teaching Practice Course (TPC) in relation to the professional requirements of third-year English major student-teachers at the Al-Arish Faculty of Education and their satisfaction with the TPC. Utilizing five validated and reliable instruments, the Supervisors' Evaluation Questionnaire, Student-Teachers' Evaluation Questionnaire, Student-Teachers' Satisfaction Questionnaire, Professional Needs Checklist (PNC), and Content Analysis Card (CAC). The study involved seventy-seven participants. Findings indicated that, after evaluating the TPC, student teachers became more aware of their professional needs but expressed dissatisfaction with the course. They reported feelings of regret, boredom, and disappointment, citing a waste of time, effort, and money on a TPC that was misaligned with their specialization. The study

recommends further research to evaluate and improve assessment tools for English majors in practice.

So, the study of Ibrahim (2021) aimed to enhance the teaching practices of fourth year students at the English department, Helwan University, through a Mentorship program. It involved six participants who were trained in mentoring techniques to reflect on and improve their teaching performance. Various tools, including reflection sheets and post-teaching questionnaires, were employed. The qualitative analysis of participant responses indicated significant benefits from the program, showing that mentorship effectively developed their teaching skills. The study also highlighted the positive impact of a supportive and cooperative environment on the participants' autonomy and self-evaluation.

The prior studies provide valuable insights into improving student teachers' EFL teaching performance in both global and Arab contexts. They emphasize the importance of reducing cognitive load in the practicum setting. Timothy, Fischer, Watzka, Girwidz, and Stadler (2023) concluded that measuring cognitive load can guide instructional strategies to better support learning in teacher education programs. In Saudi Arabia, Alsamadani (2017) asserts a model for teacher training. Ibrahim (2021) further highlighted the importance of supervisors and teachers feedback on Saudi EFL student-teachers' performance. In Libya, Al Sharif (2019) found that English student teachers lack classroom management. He recommended that the practicum period be extended from one semester to a full year. In Egypt, El-Sawy (2018) and El-Maleh (2021) both examined the structure and effectiveness of teaching practice programs for English majors. El-Sawy noted that these programs need alignment with student specialization. El-Maleh's study of Al-Arish Faculty showed that the need for better course design and assessment methods.

## Context of the problem

The problem addressed in this study was identified from multiple sources:

First, the problem investigated in this study stems from several observed challenges during the researcher's teaching experience in various schools in Damietta Governorate. It was noted that many student teachers struggle to master content knowledge. Additionally, they exhibit limited awareness of subject requirements, planning, and lesson goals. Furthermore, they demonstrate weakness in several elements of classroom management and lack integrative interaction with their students. When introducing new language materials, they often lack essential skills. They were also unable to provide instructions in the target language. So, they often use the Arab language. At the end of the lesson,

they ended it out of a sudden without using sequencing closure or proper assessment. Furthermore, cognitive load influences their teaching performance, adding to these challenges.

Second, this is further supported by a review of previous research within the Egyptian context. Prior studies have emphasized the challenges faced by student teachers in their teaching performance during the practicum. Ibrahim (2021) investigated the issues pre-service teachers encounter during their practicum, highlighting the need for systematic training to equip them with the necessary skills to become professional educators. This finding is further reinforced by the studies of El-Maleh (2021) and El-Sawy (2018), which also underscored the importance of proper mentorship and training during the practicum.

Third, a pilot study was conducted at Abbas Al Akkad School, El Kafrawy Secondary Experimental Language School, Dr. Ahmed Zewail School, and Omar Ibn Abdel Aziz Secondary School for Girls. Semi-structured interviews were held with forty student teachers and seven EFL teachers and supervisors. The pilot study was conducted in their respective schools, where they were orally asked open-ended questions, such as: "What do you think about the teaching experience in schools? What are the most challenging issues you face? What are your teaching strengths and weaknesses? How do you evaluate your classmates' performance? What areas need improvement? What tools do you use to reflect on your performance and your partner's? Do you experience any cognitive load while teaching? (For all questions, see Appendix A). As for questions posed to the in-service and supervisors were as follows: How do you evaluate the preparedness of student teachers to handle real classroom challenges? What methods or tools do you encourage student teachers to use to reflect on and evaluate their teaching practices? Do you observe any signs of cognitive load in student teachers? How do you think this affects their performance (For all questions, see Appendix B). The findings reveal the following:

1. Eighty-nine percent of participants expressed a need to improve their pedagogical competence.
2. Ninety percent indicated a lack of classroom management skills.
3. Ninety-one percent reported difficulties with lesson delivery and knowledge assessment.
4. Ninety-six percent of the student teachers had never received training on reflective teaching practices and were unfamiliar with reflection and its application.
5. Ninety-three percent of participants experienced cognitive load when receiving information during teaching performance.

## Statement of the Problem

Based on prior research and the findings of the pilot study, the current study addresses significant challenges related to EFL student teachers' teaching performance during the practicum. These challenges, highlighted by earlier studies and validated by the pilot study's results. Thus, there is a pressing need for a reflection-based program to enhance student teachers' EFL teaching performance and decrease their cognitive load. It aims to enhance student teachers' classroom skills, especially in areas such as pedagogical competence, classroom management, and reflective practice.

## Questions of the study

The present study aimed to answer the following question:

1. What are the essential EFL teaching performance skills required for student-teachers?
2. What is the framework of a reflection-based program for enhancing student teachers' EFL teaching performance skills and decreasing their cognitive load?
3. How effective is a reflection-based program in developing student-teachers' EFL teaching performance skills?
4. How effective is a reflection-based program in decreasing student-teachers' cognitive load?

## Hypotheses of the Study

1. There are statistically significant differences between the instructor-assessment, peer assessment, and self-assessment scores for student teachers' EFL teaching performance skills in the pre-test.
2. There are no statistically significant differences between the instructor-assessment, peer assessment, and self-assessment scores for student teachers' EFL teaching performance skills post-test.
3. The reflection based-program would enhance the EFL teaching performance as a whole and its skills of student teachers.
4. The reflection based-program would decrease cognitive load for student teachers.

## Significance of the study

The significance of the present study lies in several important aspects:

- The study emphasizes the need for reflective practice in teaching, helping pre-service teachers develop self-awareness and improve their teaching performance through structured reflection.

- It contributes to enhancing student teachers' EFL teaching performance by integrating reflective practices. This helps student teachers evaluate their teaching methods, improving classroom delivery and management.
- It addresses the challenge of cognitive load by introducing strategies that support student teachers in organizing and processing information. It helps in reducing the mental burden during teaching.

## Definitions of terms
## Practicum

According to Malikebu, McDonald, and Jordaan (2024). A practicum is a hands-on training experience within a teacher education program that allows student teachers to apply theoretical knowledge in a real classroom setting. It is designed to prepare future educators by immersing them in actual teaching environments, where they can practice teaching under the guidance and supervision of experienced mentors. The practicum aims to help student-teachers develop essential teaching skills, understand classroom dynamics, and reflect on their teaching practices to improve their professional competence.

## Procedural Definition of a Practicum

A practicum is a key component of teacher education programs that provides pre-service teachers with hands-on experience in real classroom environments. It involves applying theoretical knowledge and skills under the supervision of experienced educators. The primary aim of a practicum is to facilitate the development of essential teaching competencies. It aims to promote reflective practice and enhance professional growth by decreasing cognitive load.

## Student Teacher

Operationally, a **student teacher** is a third-year student enrolled in a teacher education program. They participate in practical, supervised teaching experience, known as a practicum, in real classrooms. During this phase, student teachers apply theoretical knowledge, develop essential teaching skills, and receive mentorship from experienced educators. The aim is to prepare them for a professional teaching career by enabling them to effectively practice classroom management, lesson planning, instructional methods, and other key elements of teaching performance.

## EFL Teaching Performance

   Operationally, EFL teaching performance of third-year student teacher encompasses key competencies essential for effective language instruction. These include pedagogical competence in setting objectives and employing suitable materials and strategies. Additionally, it fosters student teacher interaction to create a supportive learning environment, and effectively delivers lessons with appropriate pacing and student engagement. Furthermore, assessment knowledge is vital for evaluating student performance, while a strong language of instruction emphasizes using clear English and integrating students' native languages as necessary. Together, these skills prepare student teacher for successful careers in language education.

## Cognitive Load

   Operationally, cognitive load refers to the mental effort required by student teachers during their practicum, as they manage instructional tasks like lesson planning, classroom management, and student engagement. High cognitive load arises from the complexities of teaching and assessing students. Reducing cognitive load aims to enhance student teachers' focus on essential teaching competencies and promote their professional growth. This may lead to improved teaching performance.

## Design of the study

The one group pre-posttest design was used in this study which involved only one group of participants to whom some treatment was given.

## Participants of the study

   Participants in this study included a sample of thirty-two third-year students majoring in English at the Faculty of Education, Damietta University, during the academic year 2023-2024.

## Instruments of the study

For addressing the study questions in the present study, the researcher developed the following instruments:

- Instructor- Assessment: Unstructured Reflection Interviews
- Self-Peer, and Instructor Assessment: Written Reflective Journals
- Self and Peer Assessment: Audio Reflective Journals
- Self-Assessment: Recorded Reflective Video
- Peer -Assessment: Peer Feedback Meetings
- Instructor- Assessment: Instructor Feedback Meetings/ Field Visits
- Cognitive Load Scale
- **Instructor- assessment: Unstructured Reflection Interviews**
  (description)

In a semi-structured interview, the researcher designed questions to explore the teaching performance skills and cognitive load challenges faced by English majors. The interview aimed to raise participants' awareness of key teaching skills and their practical application in the classroom. It was conducted during the program with 40 participants. The interview assessed their skills in *Pedagogical Competence, Teacher-Student Interaction, Lesson Delivery, Assessment Knowledge, and Language of Instruction.* Questions were reviewed for clarity to ensure participants could comfortably express themselves, and they were asked to provide written responses.

### Validity of Unstructured Reflection Interviews

Validity was employed through frequency of issues raised by respondents within the interview. For more detailed frequency of statements in the interview data raw frequencies and percentage within category, see Appendix C). Similarly, respondent validity was employed through member checking, which allows participants to re-evaluate the validity of the study in dialogue with the researcher. This process enhances research validity by giving participants the opportunity to verify or clarify the researcher's interpretations during data collection. Using techniques such as echoing and paraphrasing, researchers can confirm their understanding, thereby strengthening the study's credibility and trustworthiness (Coleman, 2021 & Slettebø, 2020).

### Reliability of Unstructured Reflection Interviews

The current researcher used multiple coding. It is also known as peer review or intercoder reliability (Coleman,2021). So, the researcher has one researcher independently analyze the data. This process aims to increase the rigor of analysis and reduce bias. The second intercoder was knowledgeable in the field, reviews codes and preliminary themes to verify or adjust findings, with any necessary changes documented in the report.(See appendix D).

### Written Reflective Journals (description)

The instructor and peer students were required to write reflective journals about the presenter lesson, completing their journaling during class. The class presenter was encouraged to write reflective journals regularly about their teaching. This helps them to better understand their thoughts and improve their teaching styles. In this program, they wrote journals daily after their teaching practice and submitted them to the researcher. Each journal included three main parts: Problems to be faced in the classroom; second, their strengths and weaknesses regarding

teaching performance; and third, they reflected on the outcomes after attempting their solutions. Initially, they found it challenging to write these journals, but after being shown the structure, they were able to do so, despite some language mistakes. For samples of three types of written reflective journals, see Appendix E).

## Validity of Written Reflective Journals

The reflective journals were checked carefully to determine the issues each topic included. Validity was assessed by examining the frequency of issues raised by respondents during the interviews. The frequencies of statements in the journals were calculated. For a detailed breakdown of the frequencies of the statements, see (Appendix F).

## Reliability of Written Reflective Journals

Multiple coding, known as intercoder reliability, was employed, where a second rater independently analyzed the written reflective journals. This process aims to enhance the rigor of the analysis and reduce bias. The second coder possessed knowledge in the field.

## Audio Reflective Journals(description)

Similarly, English majors were asked to regularly record reflective commentary journals about their teaching and their peers. So, they recorded these commentary journals daily after their teaching practice and sent the audio tracks to the researcher via the WhatsApp application. In each audio journal, they expressed their fears and feelings regarding the experience, focusing on their strengths and weaknesses in teaching performance for both themselves and their colleagues. Using audio recordings instead of researcher notes allowed for raw data to be scrutinized, while producing verbatim transcripts from these recordings provided a deeper and more revealing picture.

## Validity of Audio Reflective Journals

Audio reflective journals were fully transcribed into written format. The reflective journals were meticulously reviewed to identify the issues addressed in each topic. Validity was evaluated by analyzing the frequency of issues raised by the students during the interviews. The number of statements in the journals was quantified. For a detailed breakdown of the statement frequencies, see( Appendix G).

## Reliability of Audio Reflective Journals

For reliability, multiple coding was utilized, involving a second rater who independently examined the audio reflective journals after they were transcribed. This approach is designed to minimize bias. The second coder had expertise in the subject area.

## Recorded Reflective Video (description)

Student teachers ask a partner to record a video of their teaching class using mobile phones. After the class, the student teachers can revisit the video multiple times, whether at school or in the comfort of their homes. This process allows them to carefully analyze and assess their teaching performance based on concrete, real-time evidence. By repeatedly watching the video, they gain valuable insights into their strengths and areas for improvement, making this a practical tool for reflective practice and professional development. It fosters self-awareness and helps them refine their teaching skills over time.

## Validity of Recorded Reflective Video

For the validity of Recorded Reflective Videos, using raw data allows for thorough examination, while creating verbatim transcripts of interviews, rather than relying on selective notes from the interviewer, enhances accuracy.

## Reliability of Recorded Reflective Video

To ensure the reliability of Recorded Reflective Videos, multiple coding was employed, which included a second rater who independently reviewed the verbatim of video reflective journals. This method aims to reduce bias, and the second coder possessed expertise in the relevant field.

## Peer Feedback Meetings(description)

Peer feedback meetings are a key component of a reflection-based program designed to assess student teachers' EFL teaching performance and decrease their cognitive load. In these meetings, student teachers evaluate their peers who are delivering lessons, providing feedback orally. This practice helps distribute cognitive load. This is done through allowing student teachers to focus on one element of their teaching at a time, such as lesson delivery, student engagement, or instructional methods.

## Validity of Peer Feedback Meetings

To ensure validity, an analysis of the students' discussions across different domains was conducted. This was achieved by utilizing raw data, which allows for a thorough examination and discussion.

## Reliability of Peer Feedback Meetings

For ensuring the reliability of peer feedback meetings, multiple coding was employed with the involvement of a second rater. This rater collaboratively evaluated the discussions held during the peer meetings. Both raters focused on identifying the main elements of the meeting analysis.

## Instructor Feedback Meetings/ field visits

In these sessions, instructors or supervising teachers observe student teachers during real classroom settings, either through direct field visits or recorded lesson reviews. The instructors then provide detailed feedback on the student teachers' teaching strategies, classroom management, student engagement, and overall lesson delivery. This feedback is often comprehensive, addressing multiple facets of teaching performance. This helps student teachers reflect on their practices based on expert guidance. By receiving professional feedback, student teachers are able to identify areas of improvement that may not be immediately apparent through self-reflection or peer feedback. Instructor feedback meetings and field visits not only help student teachers improve their teaching performance but also contribute to decreasing their cognitive load by providing structured reflections.

## Cognitive Load Scale (description)

The scale consists of four domains as follows: Mental Demand, Physical Demand, Temporal Demand and Performance, and Frustration Level, with a total of twenty-five items.

1. **Mental demand** – This domain assesses the cognitive load required for teaching, including decision-making, thinking, memory, and mental effort. It consists of eight items.
2. **Physical demand** – This domain evaluates the physical aspects of teaching, such as body language, control, physical exertion, and exhaustion. It involves six items.
3. **Temporal demand and performance** – This combined domain measures time-related pressures during teaching and the achievement of teaching goals, both personal and from the teacher's guide (5 items).
4. **Frustration level** – This domain assesses emotional responses, including insecurity, discouragement, irritation, self-complacency, relaxation, and self-esteem during teaching (6 items). The items are

rated across five levels: Extremely High, High, Average, Low, and Extremely Low.

**Purpose of the Cognitive Load Scale**

The purpose of the Cognitive Load Scale is to measure the cognitive load experienced by third-year English major student-teachers while engaging in teaching performance in practicum classroom. It aims to assess the mental effort required for processing information and completing tasks, which can influence teaching performance.

**Piloting the Cognitive Load Scale**

The researcher piloted the scale on a sample of thirty students. This was done for insuring the appropriateness, validity, timing, and item validity of the scale. For timing, it was estimated by 35 minutes.

**Validity of Cognitive Load Scale**

To measure the scale validity, its initial version was submitted to jury of specialists in EFL. They were asked to read and examine the scale then to evaluate each item and to determine representativeness of the items for each dimension and for the scale as a whole. It was proven valid.

**Reliability of Cognitive Load Scale**

The reliability coefficient of the scale as a whole was 0.84 on Cronbach's alpha which indicated a high level of internal consistency estimation of the scale and proved the scale reliable.

**Reflection based-program**

The program consisted of 12 sessions, initially held once a week and then daily during the final week. Meetings took place in the school where student-teachers gained real classroom experience. Key teaching performance points were covered at the start, with demonstrations and debriefings on reflective tools provided. Each student-teacher clearly understood their role. For detailed session information, see (Appendix H).

**Aims of the reflection based-program**

- Help student teachers identify essential teaching performance skills required for them.
- Determine areas of weakness in their teaching performance.
- Encourage reflection on their own and colleagues' performance using various reflective tools.
- Develop their awareness of cognitive load.
- Follow a series of steps to reduce cognitive load.

## Steps of the reflection based-program

### Diagnostic Stage

In this stage, five instruments were used to assess the strengths and weaknesses of EFL student teachers. First, field visits were conducted, during which the researcher (internal supervisor) observed the student teachers' classroom performance. Second, unstructured meetings were held between the researcher (internal supervisor) and the external supervisor (inspector) to identify problematic teaching areas and weaknesses. Third, semi-structured meetings with the EFL student teachers were held before and after their classes to reflect on their performance and discuss the challenges they faced. Fourth, both written and oral exams from the "Practicum" subject were analyzed to identify the most challenging issues the students encountered during their training. For samples of the written exams see (Appendix I). Fourth, a documentary analysis was conducted, where several lesson plans from the students' notebooks were examined to assess their understanding of the steps of the lesson plan and to what extent they implemented them. Finally, Cognitive load scale is pre-applied to the student teachers. They are supposed to click the google form link and response to the scale.

### Results of diagnostic stage

After all of the instruments were applied, data triangulation was performed in order to determine the most required points to be manipulated in the program for the EFL student teacher.

Figure 1

*Elements of Teaching Performance Skills in Reflection-Based Program*

| Pedagogical Competence | content objectives, instructional materials, teaching methods, strategies and techniques. |
|---|---|
| Teacher-Student Interaction | building rapport ,active listening and empathy , learning environment ,considering different types of interaction and feedback. |
| Delivering Lessons | Lesson steps, pacing and sequencing of activities, and student participation |
| Assessment Knowledge | evaluating student performance and student production. |
| Language of Instruction | comprehensible English,using the native language and variating classroom language. |

*Note:* This model shows the main elements of teaching performance skills in reflection-based program. Source: Original

### 2. Pre-Teaching Stage:

This stage includes the first week, during which the instructor/researcher conducted an orientation interview. It conducts a 60-minute orientation interview with each group of student teachers in their school. The purpose of this interview was to allow student teachers to reflect on their prior theoretical knowledge regarding their beliefs, teaching performance, and how to perform effectively in the classroom. Additionally, the instructor aimed to introduce them to the reflective tools they would implement  during the reflective teaching program.

The interview consisted of open-ended questions that encouraged student teachers to reflect on their previous experiences in the following areas:

1. Pedagogical Competence: Content objectives, instructional materials, teaching methods, strategies, and techniques.
2. Teacher-Student Interaction: Building rapport, active listening and empathy, learning environment, types of interaction, and feedback.
3. Delivering Lessons: Lesson steps, pacing and sequencing of activities, and student participation.
4. Assessment Knowledge: Evaluating student performance and analyzing student production.
5. Language of Instruction: Using comprehensible English, incorporating the native language, and varying classroom language.

The program begins by introducing a reflective approach to be applied throughout. Student teachers are encouraged to video recoded  their teaching performance using mobile phones for later review. Written reflective journals are also emphasized, allowing participants to reflect on their peers' performance. Additionally, audio reflective journals are required, where student teachers record comments on both their peers and themselves, sending these recordings to the researcher for analysis. Peer feedback and instructor feedback meetings are held at the end of each class to reinforce learning. To reduce cognitive load, the researcher assesses the participants' current knowledge and beliefs. In doing so, the researcher customizes content to prevent overwhelming them with redundant or unnecessary information. Fundamental

concepts are introduced first, laying a foundation before moving on to more complex topics.

**During the teaching stage**

This stage spans seven weeks, from the second week to the eighth week. Its purpose is to immerse student teachers in real classroom teaching and encourage reflection on their performance. Several procedures take place during this period. Student teachers deliver lessons, applying their reflections on content objectives, teaching methods, classroom interaction, and assessment techniques. They are supposed to consider the following points:

- During the teaching stage, student teachers are expected to carefully prepare and deliver their lessons with a clear focus on content objectives. They begin by outlining the learning goals, ensuring that students understand what they are expected to achieve by the end of the class. To support these objectives, student teachers incorporate a variety of teaching aids, such as handouts, multimedia, and visual aids, which are aligned with the lesson's goals. The lessons are delivered in a structured and organized manner, using a variety of teaching methods, strategies, and techniques to cater to students' diverse learning styles and needs.

- Additionally, student teachers focus on building rapport with their students. They use techniques like calling students by their names and encouraging them to participate. This helps create a positive and supportive learning environment. They demonstrate active listening and empathy, ensuring that students feel valued and understood. By fostering an emotionally safe setting, student teachers facilitate various types of interactions; including student-teacher, teacher-student, and student-student exchanges. Actually, This variety encourages positive communication among students. Additionally, they provide constructive feedback, which helps strengthen relationships.

- Student teachers are expected to deliver lessons clearly and engagingly. They follow a sequence of lesson steps. This helps guide students through the learning process. They use varied strategies to capture students' attention. Student teachers also encourage students to participate actively. This participation helps students use and practice the language related to the material.

- Student teachers are expected to understand how to assess student performance. They learn to use both formative and summative assessments. Formative assessments help them check student

understanding during lessons. Summative assessments evaluate learning at the end of a unit or course. They also analyze what students produce, like tests or assignments. Based on this analysis, they provide feedback.

- Finally, student teachers are expected to use clear and understandable English when communicating in the classroom. They should use simple language for instruction so all students can follow along. When needed, they can also use the students' native language to help explain concepts. Additionally, they should vary their language to meet the different needs of students.

- All the class explanations, management, and assessment closures are the responsibility of the student teacher who is delivering the lesson. The instructor/researcher observes these sessions, takes notes, and writes comments on the student teachers' performance. One of the student teachers' partners is responsible for video recording the lesson, while other partners write their reflections in their journals. For decreasing student teacher cognitive load, the researcher encourages student teachers to break lessons into manageable chunks. In addition, the researcher implement a gradual different presentation, drilling, and practice techniques (echoic, transformational, substitutional drills, controlled practice and free practice…etc.)

**Post-Lesson Reflection Stage**

- In the evaluation stage, various instruments were used to assess the teaching performance. Unstructured reflection interviews were held with the entire group after each lesson. The instructor/researcher employed reflective tools such as written reflective journals and peer feedback meetings.

- The student teacher, who is a lesson presenter first reflects on their teaching performance, focusing on the key areas previously discussed, with an emphasis on the challenges faced. These reflections are recorded both in writing and on audio reflective journals.

- During the unstructured reflection interviews, the instructor/researcher facilitates a group discussion about the lesson. Each member of the group provides their feedback, offering constructive insights into what was done during the lesson. The student teacher who is a lesson presenter then reviews the recorded video and reflective journals at home to gain a complete picture of their performance.

- In the following meeting, the student teacher shares additional comments after reflecting on their teaching at home. For future classes, they work on addressing their weaknesses and correcting any mistakes, whether intentional or not. Throughout the process, the student teacher documents their thoughts on what went well and areas that need improvement.
- For decreasing cognitive load, the researcher creates an environment where students feel safe to ask questions. This helps clear up confusion and misunderstandings right away, reducing cognitive overload. The researcher also includes peer teaching opportunities. When students explain concepts to each other, it strengthens their understanding and makes it easier for the teacher. For decreasing cognitive load, the researcher encourages student teachers to think about their teaching experiences. They should focus on how they managed cognitive load during lessons. The researcher asks them to identify strategies that worked well and areas where they can improve. Additionally, the researcher reviews student feedback to find out if the students felt overwhelmed or confused. This feedback can help with future lesson planning.

**Results and discussion**

To verify the research hypotheses, SPSS/PC) was used for statistical analysis.

The first hypothesis states that: There are statistically significant differences between the instructor- assessment, peer assessment, and self-assessment scores for student teachers' EFL teaching performance skills in pre-test.

A one-way analysis of variance ANOVA test was run to investigate the first hypothesis. As first hypothesis states that "There are statistically significant differences between the instructor- assessment, peer assessment, and self-assessment scores for EFL students' teaching performance skills in pre-test." The one-way analysis of variance (ANOVA) is used to determine whether there are any significant differences between the means of three or more independent (unrelated) groups.

**Table 1**

*One-way Analysis of Variance (ANOVA) Test of the Three Assessment (Instructors-Assessment, Peer Assessment, and Self- Assessment) for Student Teachers in Teaching performance skills in the Pre -Application*

|  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 2440.188 | 2 | 1220.094 | 313.612 | .000 |
| Within Groups | 361.813 | 93 | 3.890 |  |  |
| Total | 2802.000 | 95 |  |  |  |

As the significance value help determining if the conditions means were relatively the same or they were significantly different from one another, significance value is (0.000) as in the previous table. Since the significance value is less than (0.05), the researcher can conclude that there was a statistically significant difference between the mean of EFL students' teaching performance skills pre application between the three assessments; instructors-assessment, peer assessment, and self-assessment. However, the significance value does not tell which condition means are different. Therefore, a post hoc test was used to determine where the significant differences are.

The ANOVA table mentioned previously provides the "omnibus F-test". In the One-way ANOVA test; there is at least one significant difference between a pair of means. Actually, there are three unique pairs of means in the current study. There was a significant difference concerning assessing teaching at $p<0.05$ level for three assessments. In other words, there are statistically significant differences between the instructor- assessment, peer assessment, and self-assessment scores as determined by one-way ANOVA on for EFL students' teaching performance skills at $p<0.05$ level for three assessments [$f$ (2, 93) = 313.612, $p = 0.000$] indicating at least one significant difference among the means. The omnibus F-test does not indicate which pairs are significantly different. Therefore, a post hoc comparison was needed to examine the difference between all pairs.

From the results so far, it is obvious that there were significant differences among the groups as a whole. The following table, multiple comparisons, shows which groups differed from each other.

Table 2

*Multiple Comparisons of the Three Assessments (Instructors-Assessment, Peer Assessment , and Self- Assessment) for Student Teachers in Teaching performance skills in Pre -Application*

| (I) groups | (J) groups | N | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|---|
| 1.00 | 2.00 | 32 | -5.84375* | 49311 | .000 |
| | 3.00 | | | | |
| | | | 6.50000* | .49311 | .000 |
| 2.00 | 1.00 | 32 | 5.84375* | .49311 | .000 |
| | 3.00 | | | | |
| | | | 12.34375* | .49311 | .000 |
| 3.00 | 1.00 | 32 | 8.80952* | .49311 | .000 |
| | 2.00 | | | | |
| | | | 3.25000* | .49311 | .000 |

Consequently, post hoc analyses were performed using the Tukey's Honest Significant Difference (HSD) test to identify exactly where significant differences exist. So, the post hoc test was conducted to

compare each of the following conditions instructors-assessment, peer assessment, and self- assessment for student teachers in teaching performance skills in the pre -application. The analysis revealed that the instructors-assessment differ significantly from peer assessment, and from self- assessment ($p$s < .05).

Post hoc comparisons using Tukey's Honest Significant Difference (HSD) test indicated that the mean differences between self-assessment and instructor-assessment = 6.50000[*], $p$ = .000 (two-tailed) which indicated that self-assessment was higher in assessing teaching performance skills than instructor-assessment. In turn, mean differences between peer-assessment and instructor-assessment= 12.34375*, $p$ = .000 (two-tailed) which suggested that instructor-assessment was higher in level in assessing teaching performance skills than peer-assessment. Additionally, mean differences between peer-assessment and self-assessment =12.34375[*] $p$= .000 (two-tailed) which implied that self-assessment was higher in level concerning teaching performance skills than peer- assessment.

The second hypothesis states that: There are no statistically significant differences between the instructor- assessment, peer assessment, and self-assessment scores for student teachers' EFL teaching performance skills posttest.

Table 3

*One-way Analysis of Variance (ANOVA) Test of the Three Assessment (Instructors-Assessment, Peer-Assessment, and Self- Assessment) for Student-Teacher in Teaching performance skills in the Post -Application*

|                | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|---------|------|
| Between Groups | 670.646 | 2 | 335.323 | 185.522 | .000 |
| Within Groups  | 168.094 | 93 | 1.807 | | |
| Total          | 838.740 | 95 | | | |

As the significance value help determining if the conditions means were relatively the same or they were significantly different from one another, significance value is (0.000) as in the previous table. Since the significance value is less than (0.05), it is obvious that there was a statistically significant difference between the mean of EFL students' teaching performance skills post application between the three assessments; peer assessment, self- assessment, and instructors-assessment. However, the significance value does not tell which condition means are different. Therefore, a post hoc test was used to determine where the significant differences are.

The ANOVA table mentioned previously provides the "omnibus F-test". In the One-way ANOVA test, there is at least one significant difference between a pair of means. Actually, there are three unique pairs of means in the current study. There was a significant difference concerning assessing teaching at p<0.05 level for three assessments. In other words, there are statistically significant differences between the instructor- assessment, peer assessment, and self-assessment scores as determined by one-way ANOVA on for EFL students' teaching performance skills skills at p<0.05 level for three assessments [$f$ (2, 93) = 185.522, $p$ = 0.000] indicating at least one significant difference among the means. The omnibus F-test does not indicate which pairs are significantly different. Therefore, a post hoc comparison was needed to examine the difference between all pairs.

Table 4

*Multiple Comparisons of the Three Assessments (Instructors-Assessment, Peer Assessment , and Self- Assessment) for Student Teachers in Teaching performance skills in the Post -Application*

| (I) groups | (J) groups | N | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|---|
| 1.00 | 2.00 | 32 | -5.15625[*] | .33610 | .000 |
|  | 3.00 |  | .81250[*] | .33610 | **.046** |
| 2.00 | 1.00 | 32 | 5.15625[*] | .33610 | .000 |
|  | 3.00 |  | 5.96875[*] | .33610 | .000 |
| 3.00 | 1.00 | 32 | -.81250[*] | .33610 | **.046** |
|  | 2.00 |  | -5.96875[*] | .33610 | .000 |

Consequently, post hoc analyses were performed using the Tukey's Honest Significant Difference (HSD) test to identify exactly where significant differences exist. So, the post hoc test was conducted to compare each of the following conditions peer assessment, self-assessment, and instructors-assessment, for student teachers in teaching performance skills in the post-application. The analysis revealed that the instructors-assessment differ significantly from peer assessment, and from self- assessment ($p$s < .05).

Post hoc comparisons using Tukey's Honest Significant Difference (HSD) test indicated that the mean differences between self-assessment and instructor-assessment=.81250[*] $p$ = .000 (two-tailed) indicated that instructor-assessment was higher in assessing teaching performance skills than self-assessment. In turn, mean differences between peer-assessment

and instructor-assessment = 5.96875[*], $p$ = .000 (two-tailed) which suggested that instructor-assessment was nearly equal to peer-assessment as per assessing teaching performance skills. Additionally, mean differences between peer-assessment and self-assessment =.81250[*] $p$= .000 (two-tailed) which implied that peer-assessment was higher in level concerning teaching performance skills than self-assessment.

The third hypothesis states that: The reflection based program would improve the EFL teaching performance as a whole and its skills of student teachers.

In analyzing the third hypothesis, Paired Samples Test was used. The Pair-difference $t$ test was used for dependent groups and correlated $t$ test. Actually, this test is concerned with the difference between the values of means of a single sample of individuals who are assessed at two different times in a 'before and after' scenario as the scores for the two means are from the same sample for each assessment.

Analyzing the third hypothesis states that: The reflection based program would improve the EFL teaching performance skills of student teachers as a whole and its skills, "Paired Samples T-Test" was used. Thus, a paired-samples $t$-test was conducted to compare the teaching performance skills of EFL student teachers as a whole and its skills for the three assessments.

Table 5

*Paired-Samples Statistics of the Pre-Post Three the Three Assessment (Instructors-Assessment, Peer Assessment, and Self- Assessment) in Teaching performance skill.*

| Group | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Pair pre-peer reflection | 34.9688 | 32 | 2.33465 | .41271 |
| Pair post- peer reflection | 40.5000 | 32 | 1.43684 | .25400 |
| Pair pre-self reflection | 40.8125 | 32 | 1.53323 | .27104 |
| Pair post- self-reflection | 45.6563 | 32 | 1.03517 | .18299 |
| Pair pre-instructor-reflection | 28.4688 | 32 | 1.96722 | .34776 |
| Pair post- instructor-reflection | 39.6875 | 32 | 1.51205 | .26729 |

In the Paired Samples Statistics table, the mean number for the peer-reflection in the pre-application of the teaching performance skills application is ($N$ = 32, $M$ =34.9688, $SD$ =2.33465) and in the posttest ($M$ =40.5000, $SD$ =1.43684).Thus, this significant difference may be

attributed to the reflection based program. As for self-reflection (*N*= 32) scored significant mean difference; mean in the pre-application (*M*= 40.8125, *SD*= 1.53323) in the post-application (*M* = 45.6563, *SD* =1.03517). Concerning instructor-reflection (*N* = 32), mean in the pre-test (*M*=28.4688, *SD*= 1.96722), and in the post-application (*M* = 39.6875, *SD*=1.51205).

Table 6

*Paired-Samples T-Test Differences in Pre-Post Teaching performance skills Application of the Three Assessments as a Whole*

| Group | Paired Differences | | | | | t | df | Sig. (2- tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| Peer Reflection | -5.53125 | 1.96722 | .34776 | -6.24051 | -4.82199 | -15.905 | 31 | .000 |
| Self-Reflection | -4.84375 | 1.95282 | .34521 | -5.54782 | -4.13968 | -14.031 | 31 | .000 |
| Instructor Reflection | 11.21875 | 2.22500 | .39333 | -12.02095 | -10.41655 | -28.523 | 31 | .000 |

Where $\alpha$ = 0.05 given that *p* = 0.000,(two-tailed), for the three assessments -the researcher can conclude that there is a statistically significant difference between the mean scores of each assessment between the pre and post application of the teaching performance skills application. Concerning the control group there is a difference that did not reach statistical significant (0.008).

In table (6) There is a significant difference in the mean scores for each assessment in the pre and post application; peer reflection (*M* = -5.53125, *SD* =1.96722), self-reflection (*M* = -4.84375, *SD* =.1.95282), instructor reflection (*M* = 11.21875, *SD* =2.22500).

Generally, the results indicate that there was a significant difference concerning the three assessments in teaching performance. Looking at each assessment individually, a significant change was indicated, peer reflection, *t* (31) = 15.905, *p* = .000, two-tailed; self-reflection *t* (31) = 14.031, *p* = .000, two-tailed; instructor-reflection, *t* (31) = 28.523, *p* =.000, two-tailed.

Table 7

*Paired-Samples T-Test Differences in Pre-Post Language Performance Skills*

| Group | Mean | N | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower | Upper | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| PC. pre PC.post | 6.1250 7.7708 | 32 | .68228 | .12061 | 1.39985 | 1.89182 | 13.646 | 31 | .000 |
| T-SI pre T-SI post | 11.3854 13.1563 | 32 | .76406 | .13507 | 1.49536 | 2.04630 | -13.111 | 31 | .000 |
| DL pre DL post | 6.3542 7.8333 | 32 | .62181 | .10992 | 1.25498 | 1.70335 | 13.457 | 31 | .000 |
| AK pre AK post | 4.3542 5.4167 | 32 | .49685 | .08783 | .88337 | 1.24163 | 12.097 | 31 | .000 |
| LI pre LI post | 6.5312 7.7708 | 32 | .36154 | .06391 | 1.10923 | 1.36993 | 19.395 | 31 | .000 |

*Note:* PC= pedagogical competence, T-SI=Teacher-Student Interaction, DL= Delivering Lessons, AK=Assessment Knowledge, LI= Language Instruction.

In the Paired Samples Statistics table, the mean number for the pedagogical competence skill in the pre-application of the teaching performance skills is ($N$ = 32, $M$ =6.1250, $SD$ =.68228) and in the post application ($M$ =7.7708, $SD$ =.68228). As for Teacher-Student Interaction ($N$= 32) scored significant mean difference; mean in the pre-application ($M$= 11.3854, $SD$= .76406) in the post-application ($M$ = 13.1563, $SD$ =.76406). Concerning Delivering Lessons ($N$ = 32), mean in the pre-application ($M$=6.3542, $SD$= .62181), and in the post-application ($M$ = 7.8333, $SD$=.62181). Concerning Assessment Knowledge in the pre application of the teaching performance skills ($M$= 4.3542, SD= .49685, and in post application *($M$= 5.4167, SD= .49685).* As for Language Instruction in pre-application of the teaching performance skills is ($M$= 6.5312, SD= .36154), and in the post-application ($M$= 7.770*, SD*= .36154).

Table 8

*Paired-Samples T-Test Differences in Pre-Post Cognitive Load*

| Group | Mean | N | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Lower | Upper | | | |
| Pre | 99.1250 | 32 | 13.36005 | 2.36175 | 4.52694 | 14.16056 | 3.956 | 31 | .000 |
| Post | 89.7813 | | | | | | | | |

The significance (two-tailed) value for the pre post application of the Cognitive Load Scale is <0.05. There is a statistically significant difference between the mean scores in the pre and post-test application for the applications of the Cognitive Load Scale. In the pre-application of the Cognitive Load Scale (*N* =32, *M* =99.1250, *SD* =13.36005), in the post-application (*M* =89.7813, *SD* =13.36005). Results indicated a significant change in managing the student teachers cognitive load Rhyming Strategy group, *t* (31) = 4.171, *p* = .009, two-tailed.

- **Qualitative statistics regarding written reflective journals**

Figure2

*S.1 Excerpt After Her First Class in a Written Reflective Journals Format.*
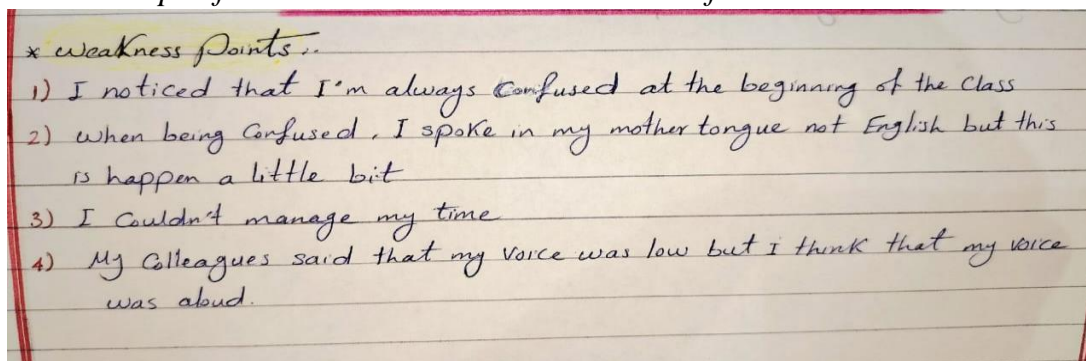


In this reflection through written reflective journals, student teachers engaged in anticipatory reflection. This actually enable them to prepare for teaching by recognizing their strong teaching characteristics within their current contexts and anticipating potential challenges they might face. This shows that student teachers particularly face challenges in their first time presenting her lesson. Her weakness revolves around time management. Furthermore, she adhere to L1 language in her instructions. Her anxiety affects negatively her voice. In this context, Gómez and Valdés (2019) state that self-evaluation becomes a key factor as it helps the teacher not only become aware of what he does, but also assume the

responsibility of reflecting on his practice critically and propositionally in order to improve it.

Figure 3
*S.2 Excerpt After Watching Her Recorded Video.*
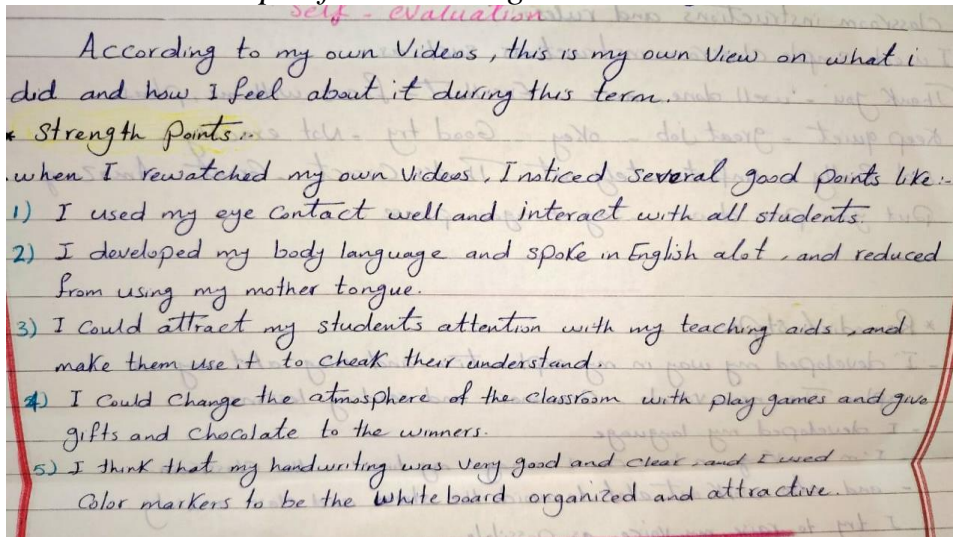


After rewatching her videos, the student teacher (S2) had many good points about her performance. She believes that she could build rapport with her students effectively. Her language of instruction is to great extent, English. Her instructional materials are attention grabbers. She can control the situation as she varfies her pace and sequencing in the classroom. The findings of Weber, Prilop and Kleinknecht (2023) support the initial assumption that videos of one's own teaching during a teaching practicum are a valuable tool for pre-service teachers and seem to be able to reduce boredom and enhance enjoyment and immersion.

Figure 3
*S.3 Excerpt After Watching Her Recorded Video*
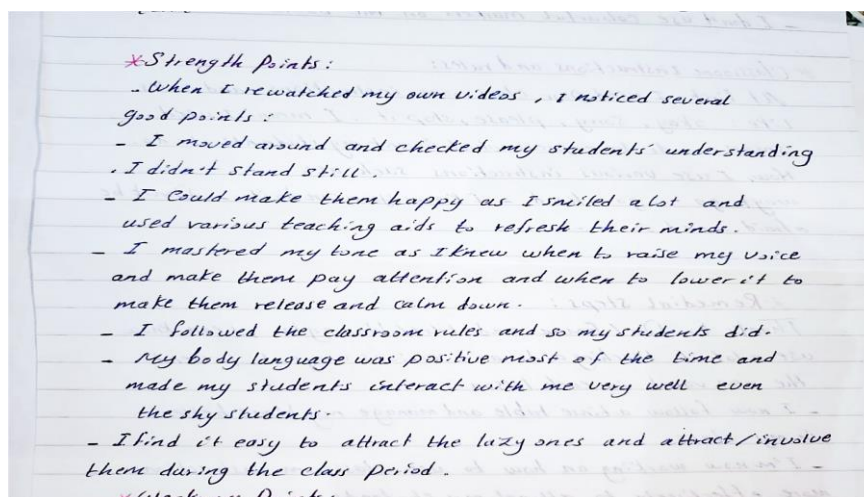
In her journaling for S3, after rewatching her video, she concentrates on the element of classroom management, with a particular focus on non-verbal language. She is aware of her voice tone. Philip (2020) asserts that teachers need feedback to improve their practice and must be offered opportunities for coaching and practice of new pedagogical skills. Actually, this is what happened, as the student teachers have a good idea of evaluating her performance.

Figure 4

*S.4 Excerpt After Watching Her Recorded Video*
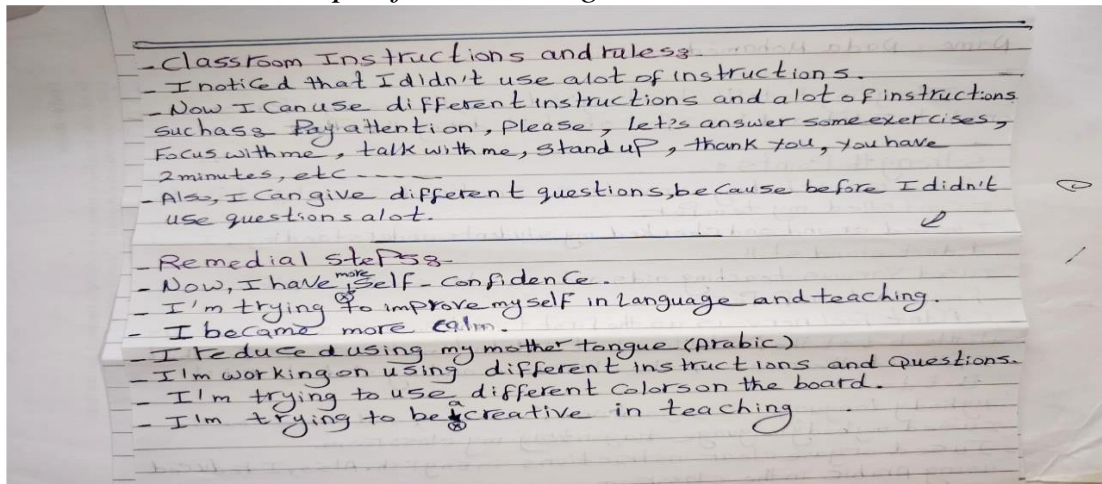


S4 presents some improvement in her performance. She can use target language instead of L1.She can overcome her anxiety, so her mind becomes more disciplined so that cognitive load may be decreased. This is in line with Young et al. (2018) who found that behavior management significantly influenced how pre-service teachers viewed their success, particularly in boosting student engagement.

**Discussion**

The results of the one-way ANOVA test showed significant differences in student teachers' EFL teaching performance skills across instructor assessment, peer assessment, and self-assessment in the pre-test. The significance value indicates that the method of assessment significantly affects the evaluation of student teaching performance. This means that students are evaluated differently depending on whether the assessment is done by instructors, peers, or through self-assessment.

However, while the test confirms that there are differences among the assessment methods, it does not specify which pairs of assessments (instructor vs. peer, instructor vs. self, or peer vs. self) are significantly different. Therefore, a post hoc test is needed to identify where these differences lie, allowing for a deeper understanding of how each assessment type uniquely impacts the evaluation of teaching performance.

The differences between instructor, peer, and self-assessment scores in evaluating student teachers' EFL teaching performance may be explained by several reasons. First, each group looks at teaching performance from a distinct perspective. Instructors, with their experience and expertise, often focus on overall teaching quality and effectiveness. Peers, on the other hand, may pay attention to areas that matter most to them, like interaction with their types. When students assess themselves, their scores are influenced by how confident they are.

Another reason is that instructors tend to be more objective as they use clear criteria to evaluate performance. Self-assessments can sometimes be biased. Student teachers may rate themselves too high or too low. They, especially in the beginning, have no clear evaluative criteria. Peer assessments may also be influenced by friendships or relationships between classmates. They tend to exaggerate each other's slight performance and neglect the apparent mistakes. Actually, this may affect how honesty is their feedback. Instructors also have a better understanding of what good teaching looks like. However, student teachers may not fully grasp all the skills needed to be a successful teacher. This can lead to differences in how they evaluate each other or themselves.

Lastly, each type of assessment might focus on different aspects of teaching. Instructors might look closely at how well students master the pedagogical content. They may focus on classroom management. Peers might focus more on the vebal and nonverbal language. Self-assessments may highlight personal strengths and weaknesses, and remedial steps for it.

Concerning the second hypothesis , the analysis of the one-way ANOVA test reveals that there are clear differences in how student teachers' EFL teaching performance is assessed by instructors, peers, and through self-assessment in the post test. These differences indicate that each type of assessment offers a unique perspective on student performance.

Drawing on the experience, instructor assessments in the post application of the program tend to be more objective and aligned with professional teaching standards. This makes instructor evaluations generally more consistent and reliable. In contrast, peer assessments reflect the views of fellow students. However, peer assessments improve significantly when compared to pre application. Student teachers at the end of the program had a good deal of experience and had clear criteria of assessment.

As for self-assessment, on the other hand, is influenced by the students' self-awareness and confidence. Students may either overestimate their performance or be critical. Thus, this leads to varied results. This can make self-assessment less reliable compared to the other two methods. However, some sort of improvement had happened to self-assessment after the application of the reflective based program.

The significant differences between these assessments may suggest that each provides valuable insights. Nevertheless, it cannot be relying on only one of them as it might not give a full picture of the student teacher's teaching performance. Therefore, combining instructor, peer, and self-assessment offers a more balanced and comprehensive evaluation of teaching performance. That is to say, there are differences between instructor, peer, and self-assessment scores in evaluating student teachers' teaching performance. Instructors have more experience and know exactly what to evaluate. Peers, because they are students themselves, might focus on interaction and engaging. Self-assessment can be tricky because students often find it hard to judge their own performance. Some might rate themselves too high if they feel confident, while others might be too hard on themselves.This result is consistent with the study of Ibrahim (2021) who highlighted the positive impact of a supportive and cooperative environment on the participants' autonomy and self-evaluation.

The post hoc analysis, conducted using Tukey's Honest Significant Difference (HSD) test, revealed significant differences between the three assessment methods—self-assessment, peer assessment, and instructor assessment—in evaluating student teachers' teaching performance skills after the teaching practice. Instructor assessments were found to be more favorable compared to self-assessments. This suggests that instructors tend to rate students' performance higher than the students rate themselves, due to their expert perspective and a more structured evaluation process.

When comparing instructor and peer assessments, the results of post application of the program showed that these two methods were relatively similar in terms of how they rated teaching performance. This indicates that peers may observe and assess teaching skills in ways that align more closely with the instructor's perspective. This may happen because they have clear criteria and full experience to evaluate upon.

In post application of the program, the peer assessments were generally higher than the self-assessments. This may imply that students tend to rate their peers more positively than they rate themselves. This could be

due to students being more self-critical or lacking confidence in evaluating their own teaching performance.

The differences in assessments of teaching performance skills among instructors, peers, and self-assessments can be attributed to several factors. Instructors often provide more informed evaluations as a result of their experience. They focus on effective teaching practices. Peers assess each other from a distinct perspective which may lead to ratings similar to those of instructors. However, student teachers may be harsher on themselves due to self-doubt or anxiety. This may lead to lower self-assessment scores. Additionally, peers typically observe visible behaviors, while self-assessments are influenced by personal feelings about performance. Pressure to perform well can also affect self-ratings. Additionally, students might feel anxious about being judged. This is in line with Ibrahim (2021) who highlighted the importance of supervisors and teachers feedback on student-teachers' performance.

The analysis of paired-samples T-tests reveals significant improvements in language performance skills from pre-application to post-application across several areas. Specifically, there was a notable enhancement in pedagogical competence, which indicates that the reflective based program employed was more effective. This suggests that the training or experience gained during the application positively influenced the student teachers' abilities. Similarly, the teacher-student interaction scores showed a significant increase. This highlights that the interactions between teachers and students became more effective over time. This improvement may reflect how effective the reflective based program was.

Furthermore, the delivery of lessons also indicated marked improvement, suggesting that participants became more adept at presenting material and teaching aids. This could be attributed to reflection tools of the program in which student teachers use and improve their performance. In terms of assessment knowledge, the growth observed indicates that participants developed a deeper understanding of effective assessment strategies. This could enhance their ability to evaluate student learning accurately and provide meaningful feedback.

Finally, the improvement in language instruction skills shows that student teachers made progress in using the target language. This is evident from the reflective journals of the student teachers, as discussed in the qualitative section. Analysis suggests that the experiences gained during the application phase led to substantial advancements in various teaching performance skills, underscoring the value of reflection-based program with its tool in professional development. All the reflection tools

assert significant improvement in the student teacher teaching performance and decreasing un their cognitive load.

Additionally, the hands-on experience gained during the application of the program helped participants become more confident and skilled in their interactions with students and in delivering lessons. As they practiced teaching, they likely developed stronger interaction skills, making their lessons more engaging. Furthermore, a better understanding of assessment techniques allowed them to evaluate student progress effectively and provide valuable feedback. Engaging with peers or instructors for feedback may have encouraged participants to reflect on their teaching practices. Hence, this led to significant improvement in teaching performance and decreasing in cognitive load. This decreasing in cognitive load match the result of Permana, Firman, Redjeki, and Hamidah (2019) and Taylor et al. (2022) who focus on the importance of CL for helping students learn. Lastly, a positive learning environment may have motivated participants to actively apply what they learned, leading to better teaching outcomes. Collectively, these factors contributed to the noticeable growth in the participants' teaching performance skills in language instruction.

## Recommendations

- Implement reflection-based programs in other disciplines and language learning settings. Extend the use of reflection-based programs to other academic disciplines and various language learning environments. This approach can help student teachers build essential teaching skills in different educational contexts.
- Use multiple reflective tools. Integrate diverse reflective tools, including audio and written journals, peer feedback, and video recordings. This combination offers student teachers a more comprehensive view of their teaching performance, promoting self-awareness and continuous improvement.
- Apply Cognitive Load Theory in language learning contexts. Use Cognitive Load Theory strategies in other English language learning scenarios. This approach can help reduce the cognitive load impact on language acquisition, enhancing the learning process.
- Engage student teachers in an ongoing learning process. Actively involve student teachers in continuous reflection and feedback throughout their training, fostering a mindset of lifelong learning and skill development.

## Suggestions for further research

- Study cognitive load theory in broader language learning contexts. Apply and test Cognitive Load Theory in other areas of language acquisition, such as writing, reading comprehension, or listening skills. This could help identify ways to manage cognitive load and optimize learning experiences in these contexts.
- Investigate long-term effects of reflective practices. Investigate the long-term impact of reflective practices on teaching effectiveness and professional growth. This could involve tracking student teachers' development over several years to assess the lasting benefits of reflective tools.
- Examine the integration of technology in reflective practice. Study how digital platforms, such as mobile apps or virtual learning environments, can support reflective journaling, peer feedback, and video-based reflections. Research could focus on the ease of use, accessibility, and overall effectiveness of these technologies in enhancing reflective practices.
- Examine the gender differences concerning reflection based programs.

## Conclusion

Briefly, this study investigates a reflection-based program designed to enhance student teachers' EFL teaching performance and reduce their cognitive load. The findings highlight the program's significant impact on improving teaching performance and lowering cognitive load. Additionally, the study examines the effects of three types of assessments on student teachers' teaching performance, noting that more training in reflective tools is needed for student teachers.

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