THE IMPACT OF TEACHER PROFESSIONAL DEVELOPMENT ON TEACHING EFFECTIVENESS: A COMPARATIVE STUDY

A Thesis

Submitted as Partial Fulfilment of the Requirements For Getting *Sarjana Pendidikan* Degree of English Language Education Study Program

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STATEMENT OF WORK'S ORIGINALITY

I honestly declare that this thesis, which I have written, does not contain the work or parts of the work of the people, except those cited in the quotation and references, as a scientific paper should.

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MOTTO

“Where there's a will, there's a way”

DEDICATION

Gratefully and thankfully, I dedicate this thesis to:

1. My eternal love, ALLAH SWT, who gives me the breath of life till this time and always protects me with all this greatness.
2. My beloved parents, thank you for your advice, affection, prayers, support, and for always giving me encouragement in completing my studies and for financing and facilitating my education from childhood until now.
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Rangkasbitung …….2025

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ABSTRACT

In Indonesia, Teacher Professional Development (TPD) had become an essential initiative to enhance teacher competence and improve learning quality, yet its implementation still varied across regions and schools. This research focused on examining how Teacher Professional Development (TPD) impacted the quality of teaching among elementary school teachers in one province in Indonesia. In this study, a comparative quantitative method was used. The sample consisted of 30 teachers, of which 15 participated in TPD and 15 did not. Danielson's (2013) evaluation framework was used to collect data through classroom observation. Then, an independent t-test was used to analyze the data. The results of the study indicated that there was a significant difference between teachers who participated in TPD and those who did not. The TPD group had a higher score (77.47) than the non-TPD group. The null hypothesis was rejected because the independent t-test produced a significance value of 0.000, which was less than 0.05. In addition, Cohen's d of 2.39 indicated a statistically and practically significant effect. These results showed that TPD actually improved the quality of teachers' teaching, especially in terms of lesson planning, implementation, and professional reflection.

Keywords: Teacher Professional Development (TPD), classroom observation, comparative quantitative method, elementary school teachers

CHAPTER I
INTRODUCTION

1.1 Background of the Study

Education has been recognized for a long time as one of the main pillars in the development of society. According to Denkowska et al. (2020) education is a learning process that aims to improve a person's knowledge, skills, and abilities. Since ancient times, education has served as a tool to transfer knowledge and skills from generation to generation. According to Syaadah et al. (2022), in the historical context, early education was usually informal, where individuals learned through direct experience and observation. However, as time progressed, formal education began to be adopted, characterized by the establishment of schools and systematic educational institutions. Formal education is not only structured to impart knowledge, but also to establish values and character that play an important role in society. Through the education process, people are prepared with the knowledge, skills and values needed to actively contribute to society. According to Mahrunnisya (2023), context of the threats faced in the 21st century, such as technological advancement, globalization and social change, the education system is required to continuously adjust and improve its quality. This includes curriculum reform, teaching methods, and improving the competence of educators.

In Indonesia, the education system has undergone radical changes since the independence era. According to Nilawati et al (2023), the government realizes that education is the key to the creation of quality human resources. Several education policies have been implemented to achieve this goal, ranging from basic

education to higher education. However, despite progress, challenges in the education system still persist. Based on statistics from the Central Bureau of Statistics (BPS) and the Ministry of Education and Culture (MoEC), there are still several regions in Indonesia that lack access to and quality of education (Badan Pusat Statistik, 2024). This is especially true in remote and underdeveloped areas, where teaching conditions and teaching quality are sub-standard. Previous research has shown that teaching quality significantly impacts student learning outcomes. According to Siregar at al (2021) found that teachers who are highly competent and receive professional training can improve their teaching effectiveness. However, most teachers in Indonesia have not had the opportunity to receive appropriate training, which negatively impacts the quality of learning in the classroom. For example, a survey conducted by UNESCO in 2022 indicated that more than 60% of teachers in remote areas do not have access to adequate professional development programs Rani et al. (2023). This limitation is one of the key factors hindering the improvement of education quality in Indonesia.

The lack of qualified teaching staff is one of the main challenges in education in remote areas. The uneven distribution between urban and rural areas exacerbates the teacher crisis in Indonesia. Many schools in remote areas need more qualified teachers, while the number of teachers in large cities tends to be excessive. In addition, teacher recruitment and placement systems could be more effective, resulting in disparities in the quality of education across. According to Siregar at al. (2021),many teachers are reluctant to teach in remote areas due to limited facilities and unattractive incentives. Inadequate education facilities, such as uncomfortable

classrooms, incomplete equipment and limited internet access, make teachers feel unable to provide effective teaching. in addition, according to Riski (2023), to ensure that the quality of education does not vary between regions, teacher certification, competence, training, and welfare must be improved. Unattractive incentives, such as low salaries and no benefits, discourage teachers from working in remote areas. Even if teachers are willing to work in remote areas, they often have to teach more than one subject for several different levels of education. For example, one teacher has to teach Math for grade 1 to grade 6 at a time. This results in poor teaching quality and affects students' understanding of the material being taught. Teachers who have to teach several subjects at once cannot give enough attention to each student, so students cannot understand the material properly.

Access to education is a fundamental human right and a key foundation for achieving equitable and sustainable development. However, the gap in access to education between urban areas and remote regions remains a significant global issue, particularly in developing countries. According to Wijayati et al. (2025), remote areas often face various challenges, such as poor infrastructure, limited numbers of teachers, and socioeconomic vulnerabilities, which hinder access to quality education. Additionally, according to Fukaro (2025),many teachers in remote areas lack adequate educational backgrounds, particularly in certain subjects such as English, science, and mathematics. Teachers who lack adequate educational backgrounds cannot provide effective instruction, so students cannot understand the material well. In some areas, many schools lack trained teachers, so teachers are forced to teach several subjects at once. This, of course, hinders the quality of

education and makes students less than optimal in learning those subjects. According to Ramadhani (2020), it was found that teachers were teaching subjects that did not match their educational background (non-linear), which certainly had an impact on teaching effectiveness. The shortage of qualified teachers in remote areas also impacts the overall quality of education. Students who do not receive effective teaching cannot understand the material well, so they cannot achieve optimal academic performance. In addition, the shortage of qualified teachers also affects students' motivation to learn. Students who do not receive effective teaching will not be motivated to learn, so they will not achieve optimal academic performance.

Based on early observations, the researcher noted that at six public elementary schools in Indonesia, challenges in education are becoming increasingly complex. Such as unequal teacher teaching quality, low teacher awareness and motivation, limited access to technology, and multiple teaching responsibilities. Especially in relation to the quality of teaching provided by teachers. According to Rahmawati (2024), the main obstacles that need to be overcome include a lack of awareness about continuing education, limited access to technology, expenses exceeding income, and being influenced by an environment that lacks motivation. Fukaro (2025), also said that success in this field also depends on community participation. Another obstacle is the lack of teachers with adequate educational backgrounds, especially in subjects considered crucial such as English, science, and mathematics. This inadequacy not only hinders the teaching and learning process but also has the potential to widen the educational gap between remote and urban areas. Teachers

who lack adequate training often struggle to convey material effectively, Burhan (2025). They may not have a deep understanding of the concepts being taught, making it difficult for them to explain them clearly to students. As a result, students struggle to understand the material, which in turn can lead to poor academic performance. In situations where teachers are required to teach multiple subjects at once, the quality of teaching is further compromised. For example, a teacher who is required to teach both mathematics and science may not have sufficient expertise in both fields, leaving students without a comprehensive understanding.

The shortage of trained teachers in remote areas also has an impact on students' motivation to learn. According to Hasibuan & Martha (2025), the main problem is the uneven distribution of teachers. Low-quality teachers, especially in remote areas, mean that students in these areas often do not have access to effective learning. When students feel that they are not receiving quality teaching, they tend to lose interest and motivation to learn. This can create a negative cycle in which low motivation to learn leads to poor academic performance, which in turn reinforces the view that education in the area is worthless. Furthermore, the impact of a shortage of qualified teachers is not limited to individual academic performance. According to Wijayanti et al. (2024), the overall quality of education in the area can be affected, creating a generation that is ill-prepared to face the challenges of an increasingly competitive world. In the long term, this can worsen social and economic conditions in the area, as poor education is often associated with higher poverty rates and fewer job opportunities.

Therefore, it is important for the government and educational institutions to take strategic steps to improve the quality of education in remote areas. This could include training programs for teachers, incentives to attract qualified teachers to remote areas, and the development of a more relevant and understandable curriculum. As a result, it is hoped that students in remote areas can receive an education equivalent to that of students in urban areas, thereby giving them better opportunities to achieve optimal academic performance.

In this context, Teacher Professional Development (TPD) emerges as a potential solution to improve teaching effectiveness. According to Wang (2024), TPD focuses on developing teachers' teaching competencies through focused and sustained training programs. TPD programs can be structured to meet the specific needs of individual teachers in different regions, both in terms of content and pedagogy. For example, TPD can include training in the use of instructional technology, curriculum development relevant to the region, and adaptive learning techniques. According to Lim et al. (2020).TPD also not only contributes to strengthening teachers' teaching skills, but also creates a more supportive and inclusive classroom environment for students. In addition, TPD can also play a role in building a professional community among teachers. Through collaboration and sharing experiences, teachers can learn from and inspire each other, Samundeeswari (2024) This can create a culture of continuous learning in schools where teachers feel supported and motivated to continuously improve their teaching practices. In addition, with a professional network in place, teachers can more easily get the

resources, information and help they need to overcome the problems they face in the classroom.

The main objective of this study is to determine whether, in terms of teaching effectiveness, there is a significant difference between teachers who participate in the Teacher Professional Development Program (TPD) and teachers who do not participate in the program. Therefore, the purpose of this study is to provide scientific evidence to suppor3t the development of education policy, particularly in terms of improving the quality of the learning process through more efficient teacher training and professional development.

1.2 Identification of the Problem

Based on the background, the main points of problem identification in relation to Teacher Professional Development (TPD) in Indonesia are as follows:

1. There are still several teachers in Indonesia lack of awareness about continuing education, limited access to technology and quality of education.
2. Many teachers in remote areas lack quality of teaching provided by teachers.
3. Teachers in Indonesia have received training, but the opportunities have not been comprehensive or evenly distributed.

1.3 Limitation of the problem

The main focus of this research is observing the teaching process, which is done by teachers who have participated in the Teacher Professional Development program and those who have not, to identify differences in their teaching effectiveness.

1.4 Formulation of the problem

Based on the limitation above, are there significant differences of teachers who have participated in the Teacher Professional Development program and those who have not?

1.5 Objectives of the Study

The objective of this study is to determine whether there is significant difference between teachers who have participated in the Teacher Professional Development program and those who have not.

1.6 Significance of the Study

This research has important significance for various parties, including:

1. For teacher

   The benefit for teachers is improved teaching skills. This research will provide an understanding of TPD strategies that can help teachers develop more innovative teaching methods and be responsive to students' needs.

2. For institution

   Benefits for Institutions or Schools The development of effective educational policies is that the findings of this study will provide valuable insights for educational institutions and policymakers to formulate more effective policies related to professional teacher development (TPD).

3. For the next researcher

   This research can serve as a reference for future studies investigating other aspects of TPD, such as its impact on teacher motivation and job

satisfaction. The findings will open up opportunities for further research on innovative teaching methods and their effectiveness in diverse educational contexts. Future researchers can explore the relationship of TPD with educational technology integration, student engagement and equity issues in education

CHAPTER II
LITERATURE REVIEW

2.1. Teaching Effectiveness

Effective teaching is the quality of a teacher to achieve learning objectives and create positive learning experiences for students. According to Safura (2022), the quality of education depends on the quality of the teacher. A teacher is one who has a significant role in education that must have a good ability in teaching to improve the education system. This concept encompasses several key aspects, such as clear communication skills, mastery of subject matter, and skills in building harmonious relationships with students. According to Samundeeswari (2024) effective teaching looks not only at academic outcomes, but also at students' social and emotional development. They are able to create a supportive learning environment where students feel safe to participate and interact, thus creating an atmosphere conducive to learning.

Indicators of teaching effectiveness include good classroom management, the use of appropriate learning strategies, and the construction of feedback. According to Munna et al (2021) good classroom management can ensure that the learning atmosphere is maintained, while varied learning strategies can bring students' various learning styles closer together. Feedback construction provided by teachers can be utilized to help students understand their own progress and identify areas for improvement. In this way, teachers can help students reach their full potential Munna et al (2021), also stated that teaching effectiveness is an area of research

that is concerned with the attributes of teachers, classroom environment, teaching acts, and their effects on the students. One can say that teaching effectiveness is the capability of teachers to teach in such a manner that they get success to bring the desirked change in the students' behavior. According to Bachtiar (2021), teaching effectiveness refers to the success of teachers in improving the quality of learning, which can be achieved through professional development, collaboration, and mastery of competencies, including content mastery, pedagogy, and the use of technology. This effectiveness is reflected in the ability of teachers to improve their skills, knowledge, and attitudes to provide meaningful and quality learning processes for students.

The importance of teaching effectiveness in education should not be underestimated. According to Danielson (2013, p. 6), teaching effectiveness is very important because it directly affects student learning success and the overall quality of education. Effective teachers are able to design and implement learning strategies that meet student needs, create a safe and supportive learning environment, and provide feedback that helps students develop.

Furthermore, teaching effectiveness is a key indicator in assessing the quality of a teacher, which impacts student learning outcomes and the success of educational programs. Accoding to Mollick & Mollick (2023), by improving teaching effectiveness, schools and educational institutions can ensure that every student receives a meaningful learning experience and reaches their full potential. According to Abidjanova (2024), effective teaching contributes to improving the overall quality of education, increasing student motivation and participation, and

leading to better academic results. When students feel engaged and motivated, they are more likely to perform at a higher level. In addition, effective teachers also play a role in equipping students with important life skills, such as critical thinking, cooperation, and communication.

In Teaching Evaluation Framework, developed by Danielson (2013a), there are four main domains used as a basis for assessing the effectiveness of teachers' teaching. These four domains are interrelated and reflect the overall professional competence of teachers in the context of high-quality learning. Here is the explanation:

1. Planning and Preparation (Domain 1)

Planning and Preparation is a domain that assesses the extent to which teachers plan their lessons before teaching. This includes teachers' understanding of the subject matter and student characteristics. It also includes how teachers set learning objectives, instructional strategies, and assessments. Danielson emphasizes the importance of planning based on student needs and standards. There are six important elements that indicate the extent to which teachers plan their teaching professionally and thoroughly. These six elements include:

a. Demonstrating Knowledge of Content and Pedagogy

Teachers must understand the substance of the subject matter, understand core and supporting concepts, and keep up with developments in science into the 21st century, including global issues and cultural diversity. Experienced teachers can see the connections between concepts, recognize learning prerequisites, and prevent common student misunderstandings. But mastery of the material alone is not

enough; teachers must also use pedagogical approaches appropriate to the discipline being taught.

b. Demonstrating Knowledge of Students

Teachers must not only convey the material, but they must also understand their students. To ensure successful learning, teachers must understand the material, pedagogical approaches, and student characteristics. Cognitive psychology studies show that students learn by actively participating in the material. Although there are common patterns of development, each student has a different way of learning and there is a possibility of misunderstanding. To make lesson planning more responsive and inclusive, students' cultural backgrounds, languages, and special needs must be taken into consideration.

c. Setting Instructional Outcomes

Teaching should always focus on clear learning objectives. These objectives are not merely activities to be carried out. Learning outcomes should be meaningful, measurable, and adaptable to student diversity. They include knowledge, thinking skills, communication skills, and attitudes or dispositions. In addition, experienced teachers have the ability to relate learning outcomes to their discipline and to other fields.

d. Demonstrating Knowledge of Resources

By skillfully using various resources, both those provided by the school and those they obtain themselves, teachers significantly improve student learning. Effective teachers always choose resources wisely, ensuring their relevance to learning objectives and benefits for students, and adapting them to the students'

level of difficulty. They even seek resources outside of school to enrich the material and help students overall.

e. Designing Coherent Instruction,

Effective instructional planning is a coherent instructional design that demonstrates the teacher's understanding of the content, students, learning objectives, and resources. This means that teachers must translate learning expectations into clear plans, understand student characteristics and the active nature of their learning, and organize the sequence of learning to help students understand the material. Good planning involves the use of appropriate resources, cognitively engaging learning activities, and deliberate grouping of students. This is done by recognizing that each student has different learning needs. Planning is tailored to the needs of each student at the highest level and even involves input from students.

f. Designing Student Assessments.

Learning assessment is necessary for effective teaching to ensure that objectives are met, which should be varied and adaptive. Assessment is also necessary for planned and continuous learning, which allows teachers and students to monitor and adjust the learning process directly.

All these elements work together to ensure that the learning process is effective, student-centered, and capable of achieving optimal learning outcomes.

2. The Classroom Environment (Domain 2)

The ability to manage relationships with students and ensure that relationships between students are positive and supportive is an important skill in teaching.

Through the way they interact with students and through the interactions they encourage and develop among students, teachers help create a classroom environment that is respectful and close-knit. Teachers' responses to students and the way students are allowed to treat each other are important components of respect and closeness. For the overall classroom atmosphere, interaction patterns are very important. All students feel valued, safe, and comfortable taking intellectual risks in a friendly environment. They are not afraid of being harassed or humiliated by teachers or other students. There are five important elements that indicate the extent to which teachers plan their classroom teaching environment. These six elements include:

a. Creating an environment of respect and rapport.

Building positive relationships with students and among students is an important skill in teaching. Through enjoyable interactions and encouraging students to respect each other, teachers create an atmosphere where everyone values one another. Students feel safe and comfortable learning in this environment. Respect is not the same as obedience.

b. Establishing a culture for learning.

"Learning culture" refers to a classroom atmosphere that emphasizes the importance of education for teachers and students. Learning culture includes norms of interaction, values of hard work, and a spirit of learning. Classes with a strong learning culture demonstrate high enthusiasm, awareness of the importance of tasks, and a belief that learning is beneficial. While emphasizing careful thinking and clear language use, teachers instill high expectations and channel students'

natural curiosity toward the subject matter. Classrooms can be cheerful and enjoyable, but you must remain focused and serious about the learning process.

c. Managing classroom procedures.

A well-organized classroom is essential for effective teaching and high student participation. Teachers establish routines and procedures to ensure that activities run smoothly and time is used to its fullest potential. Characteristics of a well-managed classroom include smooth management of equipment, quick completion of non-teaching tasks, and effective use of study groups. The classroom will appear to run automatically once habits are established.

d. Managing student behaviour.

Classrooms should have a professional, productive, and orderly atmosphere so that students are focused and engaged in learning. In this type of classroom environment, rules of conduct are clear and understood by students, and interactions between students are respectful. Students continue to feel valued even after their behavior has been corrected. Good teachers do not view positive behavior as an end goal, but as a foundation for encouraging student engagement.

e. Organizing physical space

A safe and organized classroom helps students learn. Teachers adjust the layout according to the age of the students and ensure that all students can see, hear, and participate. Teachers and students make good use of technology.

3. Instruction (Domain 3)

Domain 3 is Instruction. This domain covers how teachers deliver learning directly to students in the classroom. There are five important elements that will be discussed in domain 3. The five elements are:

a. Communicating with students

In addition to clearly communicating learning objectives, teachers use examples and illustrations to support the material. Each student should know what they are learning and why it is important in a clear manner.

b. Using Questioning and Discussion Techniques

Teachers' questions encourage students to think critically, not just memorize. Discussions are lively and open, involving many students, and providing space for opinions and reflection.

c. Engaging Students in Learning

Teachers make learning activities that are interesting, challenging, and tailored to students' needs. Students are not just "busy" but truly learning.

d. Using Assessment in Instruction

During the learning process, teachers use assessments to determine how well students understand the material. Feedback is provided immediately, and the results of the assessments determine how teaching is adjusted.

e. Demonstrating Flexibility and Responsiveness

If learning does not go according to plan, teachers can adapt and change their teaching methods or approaches. They also pay attention to what students want and are ready to adjust the material to the circumstances of the class.

4. Professional Responsibilities (Domain 4)

In Domain 4, professional responsibilities describe teachers' responsibilities outside of direct teaching activities in the classroom. This means that, besides delivering lessons, teachers also play a vital role as professionals in the following areas:

a. Reflecting on Teaching

Teachers consciously evaluate their teaching practices to identify what works and what doesn't in order to improve future learning. This reflection is honest and used as a basis for improvement.

b. Maintaining Accurate Records

Teachers accurately and neatly record important information like grades, attendance, and learning progress. Monitoring and sharing these records with others is helpful.

c. Communicating with Families.

Teachers communicate openly and effectively with parents or guardians about their students' academic progress and other needs. Communication is done professionally and proactively.

d. Participating in a Professional Community

Teachers participate in school activities and work together with colleagues and the educational community. Teachers show concern for enhancing the school's overall quality.

e. Growing and Developing Professionally

Teachers are still learning and improving their skills through training, reflection, or staying up to date with the latest changes in education.

f. Showing Professionalism

Instructors act morally, fairly, and responsibly in every aspect of their work. This includes maintaining student confidentiality, making professional decisions, and upholding high standards.

In the Framework for Teaching, four domains outline the overall tasks of teachers. Domain 1 emphasizes the importance of planning lessons well, Domain 2 discusses creating a calm and supportive classroom environment, Domain 3 discusses how to conduct effective and responsive learning, and Domain 4 discusses teachers' professional responsibilities outside the classroom. All four work together to shape effective and professional teaching.

2.2. Teacher Professional Development

Teacher professional development (TPD) is a continuous process aimed at improving teachers' competencies, knowledge, skills, and attitudes in performing their duties effectively. Adiani et al (2022) stated that teacher development is the professional growth a teacher achieves as a result of gaining increased experience and examining his or her teaching systematically. Professional development includes both formal experiences (such as attending professional workshops and meetings, mentoring, etc.) and informal experiences (such as reading professional publications, watching documentaries on television related to the academic discipline, etc). This activity is not limited to formal training, but includes all forms

of learning that help teachers continue to develop professionally. According to Yudhistira et al. (2020), the modern education era, teachers are required to be able to adapt to changes in the curriculum, technological developments, and the increasingly diverse learning needs of students. Therefore, professional development is an important part of a teacher's career so that they can provide relevant, meaningful, and positive learning experiences for student development.

Teacher professional development is closely linked to teaching effectiveness. According to Samundeeswari (2024), teachers who participate in various professional development programs generally demonstrate improvements in subject mastery, innovative teaching strategies, and the ability to evaluate student learning outcomes more accurately. This directly impacts the quality of classroom interactions, student engagement in the learning process, and the achievement of more optimal learning outcomes. According to Meesuk et al (2020) teachers who continuously develop themselves not only become more confident in teaching but also capable of creating a more inspiring and productive learning environment. Therefore, support for teacher professional development programs is an important investment in the overall effort to improve educational quality.

2.2.1 Types of Teacher Professional Development

There are various forms of teacher professional development. According to Richards & Farrell (2005, p. 8-13), there are some types of teacher professional development to choose from, each with different characteristics and objectives:

1. Workshop

   A workshop is a structured training session conducted by an expert or facilitator, usually lasting a specific period of time, with the aim of providing teachers with new knowledge and skills regarding certain aspects of teaching or professional development.

2. Self-monitoring:

   The process of teachers evaluating their own teaching practices, such as watching lesson recordings or analyzing classroom activities, to identify strengths and areas for improvement. This is the first step in personal and professional development.

3. Teacher support group:

   A small group of teachers who meet regularly to share experiences, discuss issues, and provide each other with support and feedback on their teaching practices. The goal is to improve teachers' competence and confidence.

4. Journal writing:

   Teachers regularly write notes or reflections on their teaching experiences. This activity helps teachers process their experiences, analyze what happened in class, and plan improvements.

5. Peer observation:

   Teachers observe each other's teaching activities and provide constructive feedback. This is a tool for learning directly from others' practices and increasing awareness of effective teaching methods.

6. Teaching portfolios:

A collection of documents containing works, lesson plans, reflections, and other evidence of teachers' competencies and teaching development. These portfolios are used for self-evaluation, coaching, and certification.

7. Analysis of critical incidents:

Examining and discussing important events that occur during the teaching process that can provide insights into challenges and opportunities for improvement. This activity helps to understand complex situations and learn from real experiences.

8. Case analysis:

Examining specific case studies of particular teaching practices to understand the situation, challenges, and possible solutions. This enriches teachers' insights and problem-solving skills.

9. Peer coaching:

Teachers collaborate directly to help each other improve their teaching practices, typically through structured dialogue and observation sessions. This mentoring is a continuous and personalized learning process.

10. Action research:

Teachers conduct small, self-designed studies on specific aspects of their teaching, with the aim of finding solutions or innovations that improve student learning outcomes.

Based on the results of the study, the categories of TPD used in this study were teachers who had participated in workshops, peer observation, and peer

coaching. It can be concluded that the three types of teacher professional development (TPD) described by Richards & Farrell (2005), namely workshops, peer observation, and peer coaching, have been participated in by several respondents. According to Sims et al. (2025), the first workshops are formal training activities that are usually guided by a facilitator or expert. In these activities, respondents acquire new knowledge and skills related to how they teach. This knowledge and these skills include learning strategies, media use, and new teaching methods. Second, where teachers observe each other teaching students, this is known as peer observation. Respondents said that through this activity, they were able to gain knowledge about other teachers' teaching practices, gain new perspectives, and receive useful feedback to improve the quality of their own teaching. The direct experience of observing the learning process allowed them to understand the strengths and weaknesses of methods and use those considered more effective. Third, collaborative and ongoing professional development is known as peer coaching. In this activity, teachers work together directly in a mutually supportive relationship to improve their teaching practices. Some respondents said that discussion sessions, joint reflection, and mutual support in facing teaching challenges helped them. This activity is unique, allowing teachers to learn contextually according to their needs.

The three forms of TPD indicate that respondents are actively engaged in efforts to enhance their professionalism as educators. These forms not only help

improve technical teaching skills but also foster a reflective and collaborative work culture among teachers.

2.3. Review of Relevant Studies

Currently, a large number of studies focus on the influence of Teacher Professional Development (TPD) on teaching effectiveness, which has been researched by previous researchers. Studies that have been completed related to TPD on teaching effectiveness will be explained further to provide a better picture of ongoing academic research. The following fields of study are included in the research in question:

The first research was conducted by Brandisauskiene et al (2020), the title is "*What Factors Matter for the Sustainable Professional Development of Teachers? Analysis from Four Countries*". aimed to explain the factors that contribute to the sustainability of Teacher Professional Development (TPD) by analyzing data from four countries, namely Estonia, Finland, Latvia, and Lithuania. This research employed a quantitative approach lower secondary school teachers data from the TALIS 2018 survey. Data analysis was conducted using SPSS Statistics 22.0 with descriptive statistics, Pearson's chi-square, and ANOVA at a 0.05 significance level. The findings revealed that the most important factors for sustainable TPD are teacher collaboration, engagement in active learning, and the duration of TPD activities. In addition, significant differences were found between countries in terms of collaboration and participation in TPD activities. Overall, the study emphasizes that sustainable TPD has a positive impact on teachers' instructional practices and the quality of classroom learning.

The second research was conducted by Meesuk et al (2020), titled "Classroom Action Research-based Instruction: The Sustainable Teacher Professional Development Strategy" aimed to examine the current situation of implementing classroom action research-based instruction by Child Development Centre teachers in Thailand and to compare the learning outcomes between teachers who applied this approach and those who did not. This research employed a quasi-experimental design using a pretest–posttest control group model and involved 81 teachers selected through multi-stage random sampling. The research instruments consisted of semi-structured interviews and a 20-item five-point Likert scale questionnaire on learning management outcomes, which had a content validity index ranging from 0.80 to 1.00 and a reliability coefficient of 0.968. The findings revealed that most teachers carried out classroom action research to address children's behavioral problems and to enhance child development, but they tended to produce simpler reports of one to two pages rather than full research reports. Moreover, the learning outcomes of teachers in the experimental group who applied classroom action research-based instruction were significantly higher than those of the control group at the 0.05 significance level. These results emphasize that classroom action research-based instruction is a sustainable teacher professional development strategy, as it promotes reflection, collaboration, and the improvement of teaching practices. The data were analyzed using percentages, mean, standard deviation, content analysis, and independent t-test.

The study is conducted by Bowman et al. (2022). The title is "Teachers' Exposure to Professional Development and the Quality of Their Instructional

Technology Use: The Mediating Role of Teachers' Value and Ability" The purpose of this study is to examine how teachers' exposure to professional development programs affects the quality of instructional technology use. In addition, this study also investigates the mediating role of teachers' values and abilities in this relationship. This quantitative researcher uses data from the 2018 TALIS international survey, and The respondents were teachers at the lower secondary education level (ISCED level 2). The relationship between variables was evaluated using Structural Equation Modeling (SEM). The research results showed that teacher participation in professional development contributed positively to the quality of instructional technology use. This effect was mediated by teacher values and abilities, indicating the importance of the content of professional development programs, not just the number of teachers involved.

The research conducted by Lesmana (2023) the title is "Enhancing Teacher Professionalism Through Training and Development Programs: A Quantitative Study in West Java, Indonesia" aims to analyze the effect of professional training and development programs on teacher professionalism in West Java, and this study was not limited to elementary schools or junior high schools, but included elementary school teachers and high school teachers in West Java. This research uses a quantitative approach with instruments in the form of structured questionnaires compiled based on previously validated instruments. The sampling technique used is stratified random sampling involving at least 400 teachers from various levels of education, both in urban and rural areas. The data collection process was carried out through online and offline surveys facilitated by schools,

education offices, and teacher associations. The data obtained were analyzed using SPSS version 26 with the application of descriptive statistical analysis (frequency, percentage, mean, and standard deviation) and inferential statistics through multiple regression analysis to test the relationship between variables. The results of the research indicate that professional training and development programs have a positive effect on improving teacher professionalism, especially in terms of commitment to continuous improvement, collaboration, and mastery of teaching materials. However, the effect of the program on ethical behavior is relatively limited, which is most likely influenced by cultural factors and personal values.

The following study by Arifudin et al. (2024), titled "*The Relationship Between Classroom Environment, Teacher Professional Development, and Student Academic Achievement in Secondary Education*". The study aims to investigate the complex relationship between classroom environment, teacher professional development, and student academic achievement in secondary education. This study aims to identify how these three factors interact to support student learning outcomes. The method used is a mixed-methods approach, and this research was conducted at the secondary education level. where quantitative data were collected through surveys of approximately 100 teachers and 150 students, while qualitative data were obtained through interviews with 5 teachers and 5 school principals. To analyze the data, statistical techniques such as regression and structural equation modeling (PLS-SEM) were used to test the relationships between the variables under study. The results of the study show a positive and significant relationship between the classroom environment and student academic achievement, as well as

between teacher professional development and student learning outcomes. A conducive learning environment and continuous teacher training significantly contribute to improving student academic achievement. These findings emphasize the importance of creating an inclusive classroom environment and providing comprehensive professional development programs for teachers to support educational success.

The research was conducted by Osiesi et al. (2024). Transforming classrooms: How professional development and teacher attitudes drive primary school teaching effectiveness" This study aims to determine how teacher professional development and teachers' attitudes toward their profession affect the quality of education in primary schools in Ekiti County, Nigeria. Quantitative data were analyzed using SmartPLS software version 4.0.8 (for validity, reliability, regression, etc.)., and this study focuses on basic education levels. Qualitative data were analyzed using thematic analysis through coding of interview transcripts. Quantitative and qualitative methods were used, and data were collected from 230 teachers through questionnaires and interviews. The results of the study show that teacher training or professional development significantly improves teaching efficiency and enhances teachers' positive attitudes toward their work. Additionally, teaching experience also has an impact, although not significantly. However, the gender and educational level of teachers do not have a significant influence. These results indicate that positive teacher attitudes and continuous training are crucial for improving the quality of learning.

Based on the literature review described above, previous research has several important similarities. First, it focuses on Teacher Professional Development (TPD) as the main factor influencing the improvement of teachers' professionalism and teaching effectiveness. Second, all research uses a quantitative approach with statistical analysis. Finally, the ultimate goal is to improve the quality of education through the development of teacher competencies. It can be concluded that various previous research has discussed the influence of Teacher Professional Development (TPD) on teaching effectiveness from various perspectives. In this study, there are also three main differences that reveal clear weaknesses in the study. First, this study focuses on teachers in remote areas, who generally have limited access to professional training and educational resources. Second, this study only involves teachers as the main subjects and does not include student data. Therefore, this study only focuses on changes and the impact of the teaching process. Third, this study uses direct observation methods, which means that teachers are only considered the main subjects.

2.4. Theoretical Framework

The purpose of this research is to determine whether there is a significant difference between teachers who have participated in the Teacher Professional Development program and those who have not. The theoretical framework of this research is based on Richard & Farrell (2005, p. 1-21). The theoretical framework of this study is based on the teacher professional development model explains the concept of Teacher Professional Development (TPD) as a reflective and continuous process to improve teaching quality. This theory is used to distinguish between

teachers who have participated in Professional Development (PD) and those who have not. Second, Danielson's (2013) theory is used to evaluate teaching effectiveness through four domains: planning, classroom environment, instruction, and professional responsibility. These two theories form the basis for observing, analyzing, and comparing the teaching effectiveness of teacher who has followed Professional Development (PD) program and unfollowed.

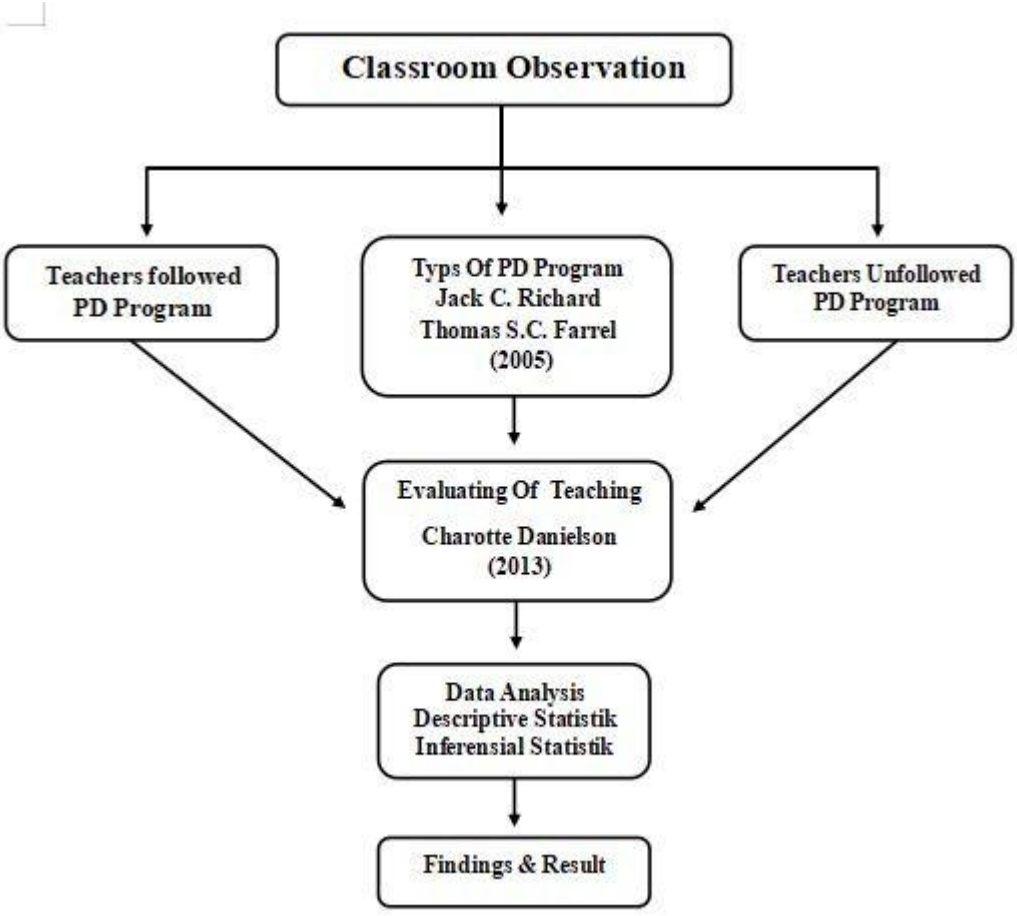

Figure 2.1 Theoretical Framework

Both were chosen because they can determine whether there is a significant difference between teachers who have participated in the Professional Development (PD) program and those who have not.

2.5 Hypotheses

In this study, researchers need to explain what is meant by a hypothesis. According to Creswell & Creswell (2023, p. 293) hypotheses are predictions the researcher makes about the expected relationships among variables. Based on the formulation of the problem and the theoretical framework, the hypothesis of this study is formulated as follows:

H_0 (Null Hypothesis): There is no significant difference in teaching effectiveness between teachers who have participated in professional development programs and those who have not.

H_1 (Alternative Hypothesis): There is a significant difference in teaching effectiveness between teachers who have participated in professional development programs and those who have not.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

In this study, the researcher used a quantitative research method and a comparative study. According to Creswell & Creswell (2023, p. 192), quantitative research is an approach for testing objective theories by examining the relationship among variables or a comparison among groups. These variables, in turn, can be measured, typically on instruments, so that numerical data can be analyzed using statistical procedures. Sugiyono (2013, p. 8) also emphasizes that quantitative research uses numbers. In this type of research, statistical formulas are then used to evaluate the validity of the initial theory or hypothesis. Quantitative method with a comparative causal approach. According to Creswell & Creswell (2023, p. 148), a comparative study is a type of non-experimental quantitative research, in which researcher compare two or more groups based on causal (independent) variables that have already occurred, to see their effect on the dependent variable. The dependent variable of the study is Teaching Effectiveness and the independent variable is Teacher Professional Development. It was applied to determine whether there were differences in teaching quality between teachers who had participated in Teacher Professional Development (TPD) and those who had not. This method was chosen because the study measured variables and analyzed data using statistical methods with data collected from two groups. This design does not directly manipulate variables but combines two naturally formed groups based on participation in the TPD program. Researchers can use this design to identify

differences or the influence of professional development experiences on teachers' teaching success in the classroom.

3.2 Population and Sample

The concepts of population and sample are very important in quantitative research. According to Nuryadi et al (2017), a population is all objects that are the subject of research or observation that have certain characteristics. The population can consist of individuals, objects, animals, plants, events, or specific phenomena. The population describes the research objects as a whole, while the sample is a portion of the population that is selected for direct observation and used as the basis for drawing conclusions.

1. Population

The population in this study consisted of teachers in remote areas of Indonesia. Public elementary school teachers were selected as the population because they are at the forefront of basic education. Therefore, the researcher wanted to know whether there were differences between teachers who had participated in Professional Development (PD) programs and those who had not. This population includes teachers from various public elementary school backgrounds. These teachers have diverse characteristics in terms of teaching experience, educational background, and participation in the Teacher Professional Development (TPD) Program. In addition, the age range of those who have undergone professional development and those who have not is different. On average, teachers who have followed Professional Development (PD) are around 30-55 years old, while those who have not followed PD program are around 20-27 years old. This study targets

teachers in the same geographical area, where environmental conditions and access to training are relatively uniform.

Table 3.1 Population of Public School Teachers

No	Name of the School	Teachers followed PD	Teachers unfollowed PD
1	Elementary School 1 Margawangi	6 Teachers	6 Teachers
2	Elementary School 1 Sankanwani	3 Teachers	6 Teachers
3	Elementary School 1 Nayagati	5 Teachers	4 Teachers
4	Elementary School 2 Nayagati	5 Teachers	2 Teachers
5	Elementary School 1 Cisimeut	7 Teachers	5 Teachers
6	Elementary School 2 Cisimeut	8 Teachers	3 Teachers
Amount		**34 Teachers**	**26 Teachers**
Percent		**56,7%**	**43,3%**
Total		**60 Teachers**	

Based on table above shows that out of a total of 60 teachers, 56,7% of teachers have participated in the PD program and 43,3% of teachers have not participated in the PD program.

2. Sample

In this study, the researcher selected samples based on school location and student level. The researcher involved 60 teachers selected from schools spread across Lewidamar Subdistrict, Lebak Regency, Banten Province. The researcher chose this location because this region still faces limitations in the Teacher Professional Development (TPD) program and shows variations in learning quality between schools, so it is considered relevant to examine the influence of TPD on teacher teaching effectiveness. According to Nyimbili & Nyimbili (2024), Purposive sampling is a sampling method in which researcher deliberately select specific participants or cases that are considered most relevant and informative for the

research objectives. This method is used to obtain depth, high quality data on specific elements that need to be revealed, as the selected participants have specific characteristics or experiences that support the research needs. To be included in the sample, teachers must still be actively teaching, have at least two years of experience, and be willing to provide feedback. The sample was taken by the researcher consists of 30 of 60 teachers, 30 samples taken from several schools selected by the researcher. Researcher used the Shapiro-wilk test because it is effective for small sample sizes of 50 respondents, in studies with a small amount of data, for example 30 or 40 respondents. The samples were consisted of 15 teachers who Teachers followed PD program and 15 who did not follow the PD program. This division was made to determine whether teachers who participated in the PD program and those who did not had differences in teaching effectiveness. Therefore, it is hoped that the data collected can provide a clear picture of how the PD program affects teaching effectiveness in the region.

3.3 Data Collection Techniques

To answer the research questions and achieve the objectives set, appropriate data collection techniques are required. These techniques are selected so that the data obtained can provide valid and reliable information about the effectiveness of learning. One of the main techniques used in this study is classroom observation.

3.3.1 Instrument

The instrument of this study was classroom observation. According to Sudaryono (2021, p. 227), a systematic process of observing how teachers teach in the classroom with the aim of collecting actual data about the teaching and learning

process is known as classroom observation. Observation guidelines can also be compiled in the form of a scale. A scale has been prepared for each item of activity or behavior observed. The following is the table of a descriptive scale from Danielson (2013).

Table 3.2 Descriptive Scale for Classroom Observation

No	Criteria	Scale
1	Distinguished	4
2	Proficient	3
3	Basic	2
4	Unsatisfactory	1

The table 3.2 above shows the descriptive scale used to assess classroom observation results. This scale consists of four levels. The highest level is Distinguished with a score of 4, which means that the teacher performs very well and exceeds standards. Next is Proficient with a score of 3, indicating that the teacher's performance is good and meets the expected standards. The next level is Basic with a score of 2, which describes the teacher's performance as still limited and only partially meeting the standards. The lowest level is Unsatisfactory with a score of 1, which means that the teacher's performance is unsatisfactory and below the expected standards. This scale helps researchers provide an objective assessment of the effectiveness of teachers' teaching during the classroom observation process.

The observation process was carried out systematically to ensure consistency and accuracy in assessing the teaching effectiveness of the 30 participants. Each teacher was observed two times during regular classroom teaching sessions to

capture a comprehensive picture of their teaching practices. The observation sessions were scheduled in advance to minimize disruption and ensure teachers were prepared for authentic classroom instruction.

The researcher used an observation sheet adapted from Danielson's (2013) Framework for Teaching, which includes four domains: (1) Planning and Preparation, (2) Classroom Environment, (3) Instruction, and (4) Professional Responsibilities. These domains served as the theoretical basis and guiding framework for the observation process. During the observation, the researcher sat at the back of the classroom to minimize interference and recorded teacher activities directly on the observation sheet. To enhance the reliability of the assessment, the observation was conducted by two raters, namely Rater 1 (the researcher) and Rater 2 (the principal or vice principal from 3 schools), each using the same instrument. The observation was conducted for 3 days in each school, for the first day conducted at A school, the second day at B school, and for the last day is in C school which focused on teaching behaviors, lesson implementation, student engagement, and the teacher's reflective practices. A total of 30 participants (15 TPD teachers and 15 non-TPD teachers) were observed using the same procedure. Each observation lasted for one full lesson (approximately 35–40 minutes). The collected scores were then tabulated and analyzed quantitatively. This step-by-step process ensured that the observation data accurately reflected the real teaching practices of the teachers and minimized bias in the evaluation.

3.3.2 Validity

In conducting classroom observations, the researcher used an evaluation assessment adapted from Danielson (2013), indicators such as lesson planning, classroom management, lesson implementation, and professional responsibility are used to directly observe the effectiveness of teachers' teaching in the classroom (see. Appendix 1). Based on the indicators of teaching effectiveness relevant to the research objectives, this observation sheet was developed and validated by experts.

3.3.3 Reliability

In this study, reliability was tested through inter-rater reliability. Inter-rater reliability refers to the consistency of assessments between raters (observers) using the observation instrument. This is important to ensure that observation instruments that are effective for teaching teachers produce objective scores that do not depend on the subjectivity of a single rater.

To conduct interrater reliability techniques, the researcher uses Cohen's Kappa (k). According to Wang et al. (2019) stated that Cohen's Kappa (k) is one of the most commonly used coefficients for measuring inter-rater reliability, takes into account the proportion of agreement between raters and the possibility of agreement occurring by chance. A Cohen's Kappa (k) value close to 1 indicates high reliability, while a (k) value less than 0 indicates that there is no agreement beyond chance. In general, a (k) value greater than 0.60 and greater than 0.80 is considered to be a near-perfect level of agreement. The following is the general formula for Cohen’s Kappa:

$$k = \frac{p_0 - p_e}{1 - Pe}$$

Where:

k = Cohens kappa

P_0 = proportion of observed agreement between raters

P_e = proportion of agreement expected by chance

Table 3.3 Interpretation of Kappa

Kappa	Agreement
< 0	Less than chance agreement
0.01 – 0.20	Slight agreement
0.21 – 0. 40	Fair agreement
0.41 - 0.60	Moderate agreement
0.61 – 0.80	Substantial agreement
0.81 – 0.99	Almost perfect agreement

To interpret the results of the Kappa coefficient, researchers often refer to established guidelines. According to Viera (2005), the value of Cohen's Kappa is used to assess the level of agreement between raters beyond what would be expected by chance. Its interpretation is as follows: a kappa value of less than 0 indicates agreement lower than chance, 0.01–0.20 indicates slight agreement, 0.21–0.40 indicates fair agreement, 0.41–0.60 indicates moderate agreement, 0.61–0.80 indicates substantial agreement, and 0.81–0.99 indicates almost perfect agreement. Therefore, the closer the kappa value is to 1, the stronger the level of agreement between raters.

Tabel 3. 4 Reliability Test

		Value	Approximate Significance
Measure of Agreement	Kappa	0,439	0,000
N of Valid Cases		30	

The table above shows that based on the reliability test results using the Kappa coefficient, a Kappa value of 0.439 was obtained with a significance value of 0.000 (< 0.05). This Kappa value falls into the moderate agreement category, which means that there is fairly good agreement between raters in providing assessments. A significance value of less than 0.05 indicates that the agreement obtained did not occur by chance but is statistically significant. The number of valid cases analyzed was 30 respondents, so these results can be used as a basis for determining that the research instrument has an acceptable level of reliability for use in research.

3.4. Data Analysis Technique

The data analysis techniques in this study were divided into two stages, namely descriptive statistical analysis and inferential statistical analysis. These stages will be used to analyze the results of observations of teaching effectiveness, both those who had participated in the TPD program and those who had not.

3.4.1 Descriptive Statistical Analysis

Descriptive statistics are used to provide an overview of how effective teachers are at teaching in both groups. The mean, median, mode, standard deviation,

minimum and maximum values are part of the data analyzed. Before further hypothesis testing is conducted, these calculations are performed to gain an understanding of the data distribution. Creswell & Creswell (2018, p. 159) states that descriptive statistics are intended to summarize numerical data so that it can be presented concisely and usefully, especially for quantitative research that relies on numerical data for decision making.

There are several descriptive statistical formulas used, including:

A) Average data score (mean)

$$Mean = \underline{amount\ of\ data}$$

$$lots\ of\ dat?$$

B) Score distance (Range = R)

R = Highest Score - Lowest score

C) Middle Value (Median)

$$\boldsymbol{Me = B_b + P\left(\frac{\frac{1}{2}n - F}{fk}\right)}$$

Information :

Me = Median

Bb = class boundaries

p = median class length

n = sample size

f = Cumulative frequency of the class below

fk = Absolute frequency of class median

D) Frequently occurring value (Mode)

$$\boldsymbol{M_0 = B_b + P\left(\frac{b_1}{b + b^2}\right)}$$

Information :

Mo = Mode

Bb = Lower limit of the mode class

P = Difference in frequency of the mode class

b1 = Difference in frequency of the mode class and the frequency of a class below the mode

b2 = Difference in frequency of the mode class and the frequency of a class above the mode.

F) Standard Deviation

$$SD = SD = \sqrt{G^2}$$

Explanation:

SD = Standard deviation

$\sqrt{G^2}$ = Square root of sample variance

3.3.2 Inferential Statistical Analysis.

In this research, inferential statistical analysis was used to test hypotheses and draw conclusions based on sample data. According to Nuryadi et al (2017), One branch of statistics is inferential statistics, which deals with drawing conclusions about a population based on sample data. This testing includes examining normality, homogeneity of variance, and hypothesis testing to determine the

significance of the difference between variables. According to Creswell & Creswell (2023, p. 145), statistical inference analysis is a quantitative analysis technique used to test hypotheses or research questions by comparing groups or linking variables, allowing researchers to draw conclusions (inference) from samples to populations. Then, inferential statistics in this study were used to test the hypothesis regarding the difference in teaching effectiveness between teachers who participated in PD program and those who did not.

1) Nomality Test (Shapiro wilk)

Before conducting further statistical analysis, the initial step that needs to be taken by the tester is to test the distribution of researcher data. This is important to determine whether the data is normally distributed or not, therefore researchers conduct normality tests as a basis for further analysis. In this study, normality tests were conducted using the Shapiro-Wilk method. This method was chosen because it is considered more appropriate for small samples and is able to provide accurate results regarding the distribution of research data.

In this study, the researcher used the Shapiro Wilk for the normality test because the sample size was relatively small**.** According to Tapia (2021), this test is used to measure normality in cases where the sample size is less than 50 observations. In large samples, the results are comparable to the Kolmogórov-Smirnov test. To generate a new sample vector, the sample is sorted from smallest to largest value. With sample sizes up to 50, normality can be tested with the Shapiro-Wilk test, which calculates the variance and mean of the

sample. If the Shapiro-Wilk statistic (-W-) is smaller than the critical value provided by the table created by the author for the sample size and significance level given, the null hypothesis of normality is rejected.

$$w = \frac{\sum_{i=1}^{n} a_i Y_i^2}{\sum_{i=1}^{n} (Y_i - \bar{Y})^2}$$

Yi is the sorted sample data. If the sample comes from a normal distribution with an unknown mean and a variance of σ2, then the data can be simplified using a simple linear equation (6).

$$Yi = \mu + \sigma \chi \, , I = 1 \, , 2 \, , \ldots n$$

The randomly ordered set N (0,1) forms the pair (x, y). Unknown coefficients are determined through least squares adjustment, obtained from the matrix expression in equation 7.

$$\dot{\boldsymbol{a}} = \frac{\boldsymbol{m'v} - \mathbf{1}}{\sqrt{\boldsymbol{m'v}} - \mathbf{1}_{\boldsymbol{m}}}$$

where V is the variance-covariance matrix of the elements of vector x, and vector m is the expected value of the elements of x, which is the mean of the order statistics for the normal distribution.

2) Homogeneity Test

One of the prerequisite tests that must be performed before analysis is the homogeneity test**.** According to Nuyadi et al (2017, p. 92) the homogeneity test is a statistical procedure that aims to determine whether two or more sample data groups come from populations with the same variance. In other words, the main purpose of this test is to ensure that the diversity characteristics of the data set being studied are very different. This test is very important for regression analysis because, for each grouping, the regression error must have the same variance. The homogeneity test is a statistical procedure that aims to determine whether two or more sample data groups come from populations with the same variance. In other words, the main purpose of this test is to ensure that the diversity characteristics of the data set being studied are very different. This test is very important for regression analysis because, for each grouping, the regression error must have the same variance. According to Levene's test interpretation, data variation is homogeneous if the Levene statistic value is greater than 0.05.

3) Independent t-test

In this study, the researcher will use the independent t-test to find out whether there are real or significant differences between two unrelated groups. According to Nuyadi et al (2017, p. 102) the independent samples t-test, also known as the independent samples t-test, is a statistical test used to compare the means of two different sample groups that are unpaired or different. The purpose of this test is to determine whether there is a significant difference between the two groups being compared. The independent t-test requires two

main criteria: both sample groups come from different populations, have a normal distribution, and are interval or ratio data. A one-sample t-test aims to determine whether the population mean (μ) is comparable to a specific value (μ) or significantly different. In other words, this test compares the sample mean with a reference value, which is considered representative of the population parameter.

$$\mathbf{H_0 : \mu = \mu 0 \text{ versus } H_1 : \mu \neq \mu 0}$$

H_0 is the initial hypothesis, H_1 while is the alternative hypothesis or working hypothesis.

Independent t-Test Formula

$$t_{h_{it}} = \frac{\overline{x} - \mu_0}{s/\sqrt{n}}$$

t = calculated t-value

S = sample standard deviation

$\bar{\chi}$ = sample mean

n = number of samples

μ = parameter value

CHAPTER IV
RESEARCH FINDINGS AND DISCUSSION

4.1 Research Findings

This chapter presents the research findings derived from the data analysis conducted in this study. The findings are systematically organized, beginning with the results of the descriptive statistics, inferential statistics, hypothesis testing, and the calculation of effect size. Each section provides a detailed explanation of the statistical outcomes that support the interpretation of the relationship between Teacher Professional Development (TPD) and Teaching Effectiveness.

4.1.1 Descriptive Statistic

1. The Result of Teachers Followed PD

The table 4.1 shows that based on the descriptive analysis of the Teacher Professional Development (TPD), there were 15 valid respondents with no missing data. The mean value of 77.47 and the median of 79.00 indicate that the data distribution tends to be balanced because the mean and median values are relatively close. The mode value of 72 indicates the number that appears most frequently in the data, although there is more than one mode. Meanwhile, the standard deviation of 7.239 indicates that there is a variation in respondent scores of around seven points from the mean value. The total overall respondent score is 1162. Thus, these descriptive results indicate that the level of Teacher Professional Development (TPD) of the respondents is in the fairly good category.

Table 4.1 Descriptive Statistic of TPD

TPD		
N	Valid	15
	Missing	0
Mean		77,47
Median		79,00
Mode		72[a]
Std. Deviation		7,239
Sum		1162

Based on the frequency distribution table 4.2, it is known that 15 teachers participated in the professional development program (TPD) with scores ranging from 61 to 88. The values that appear only once, with a percentage of 6.7%, are 61, 67, 75, 80, 82, 83, and 88. Meanwhile, the values that appear more frequently are 72, 77, 79, and 85, each occurring twice or 13.3%. This shows that the distribution of TPD scores is fairly even, with no domination of any particular score. The cumulative percentage reaches 100% at a score of 88, which indicates that all data has been accumulated. In general, these results illustrate that teachers' scores in TPD vary, but the majority are in the medium to high score categories.

Table 4.2 Frequency of TPD

		Frequency	Percent
Valid	61	1	6,7
	67	1	6,7
	72	2	13,3
	75	1	6,7
	77	2	13,3
	79	2	13,3
	80	1	6,7
	82	1	6,7
	83	1	6,7
	85	2	13,3
	88	1	6,7
	Total	15	100,0

Based on the TPD value histogram 4.1, it can be seen that the distribution of teacher achievement is in the range of 61 to 88. A small number of teachers obtained scores in the low range (60–70), while the majority were in the middle to high range, especially in the 75–85 range, which dominated the frequency count. The average TPD score for teachers is 77.47 with a standard deviation of 7.239, which indicates that teachers' achievement results vary relatively but remain around the average score. Thus, it can be concluded that most teachers have a good level of involvement in the professional development program (TPD).

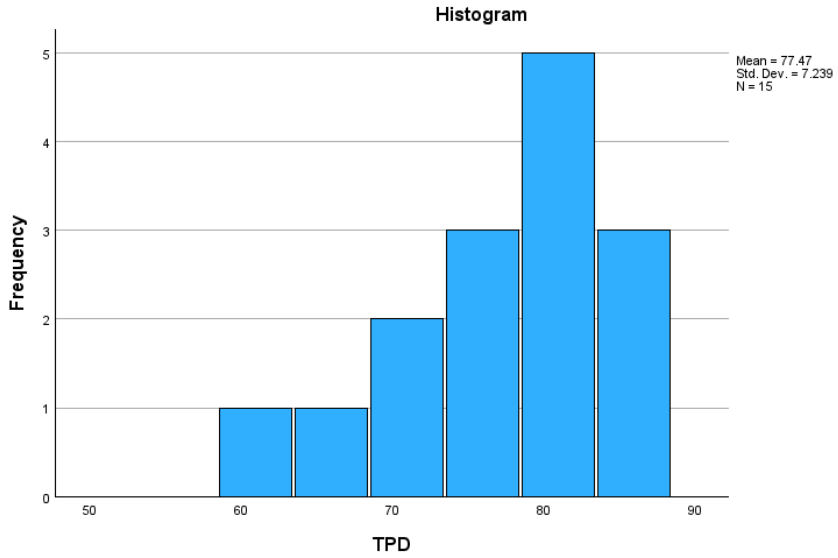

Figure 4.1 Frequency of TPD

2.The Result of Teachers Unfollowed PD

Based on the statistical table 4.3 of results for teachers who did not participate in PD (Non-TPD), it is known that there were 15 respondents with complete data and no missing data. The average score for teachers who did not participate in PD

was 63.47, with a median of 63.00 and a mode of 60. The standard deviation of 4.015 indicates that the data distribution is fairly small or relatively homogeneous. The total accumulated score of all teachers who did not participate in PD is 952. Thus, it can be concluded that the achievement of teachers who did not participate in PD is in the moderate category, with not too much variation in scores between respondents.

Table 4.3 Descriptive Statistic of Non-TPD

Statistics		
Non_TPD		
N	Valid	15
	Missing	0
Mean		63,47
Median		63,00
Mode		60
Std. Deviation		4,015
Sum		952

Based on the Non-TPD score distribution table 4.4, it is known that there are 15 respondents with scores ranging from 57 to 71. The lowest score was obtained by one teacher with a score of 57 (6.7%), while the highest score was obtained by one teacher with a score of 71 (6.7%). Most respondents obtained a score of 60, namely four teachers (26.7%), making this the most dominant score. In addition, there were two teachers who obtained scores of 62 and 65 (13.3%), respectively. Combined, the majority of teachers, namely eight (53.3%), were in the 60–65 score range. Overall, the data show that the achievements of non-TPD

teachers tend to be concentrated in the moderate range, with a relatively even distribution but more clustered in the lower-middle scores.

Table 4.4 Frequency of Non-TPD

		Frequency	Percent
Valid	57	1	6,7
	60	4	26,7
	62	2	13,3
	63	2	13,3
	65	2	13,3
	66	1	6,7
	68	1	6,7
	70	1	6,7
	71	1	6,7
	Total	15	100,0

The histogram 4.2, shows the distribution of scores for teachers who did not participate in Teacher Professional Development (Non-TPD). Based on the analysis results, the highest score obtained by respondents was 71, while the lowest score was 57. The distribution of scores appears to be more concentrated in the 60–63 range, with the highest frequency reaching 4 respondents. The average score for Non-TPD teachers was 63.47 with a standard deviation of 4.015, indicating that most respondents' scores were around the average with relatively little variation. Overall, this histogram indicates that the achievements of Non-TPD teachers tend to be in the moderate category, with relatively fewer respondents obtaining high or low scores.

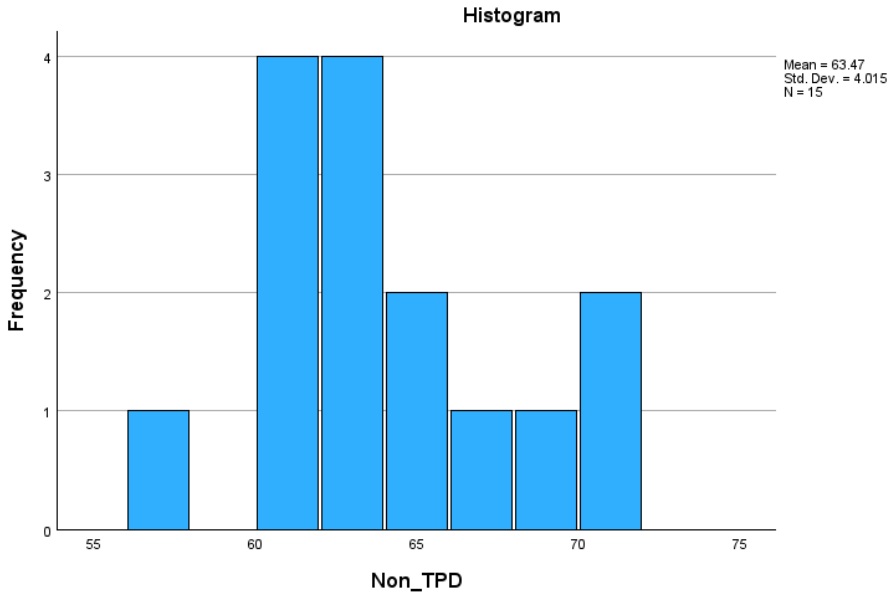

Figure 4.2 Frequency of Non-TPD

3. Comparison of TPD and Non-TPD

The table 4.5 presents the average scores of two different groups. The TPD (Teacher Professional Development) group had an average score of 77.47, while the Non-TPD group had an average score of 63.47. This table shows a significant difference in average scores between the two groups. The higher scores in the TPD group indicate that participation in the teacher professional development (TPD) program may have a positive impact on achievement, which in this context is measured by average scores. This difference is an important basis for further statistical analysis to determine whether it is coincidental or truly has scientific significance.

Table 4.5 Comparison between TPD and Non-TPD

Mean	
TPD	**Non-TPD**
77.47	63.47

The average learning outcomes of the two groups differed, as shown by the figure 4.3. Students in the group taught by teachers who participated in the PD program obtained an average of 77.47, while students in the group taught by non-TPD teachers obtained an average of 63.47. Descriptively, these results show that the professional teacher training program had a positive impact on student learning outcomes. The higher average score in the PD group indicates that this program may improve the quality of teaching.

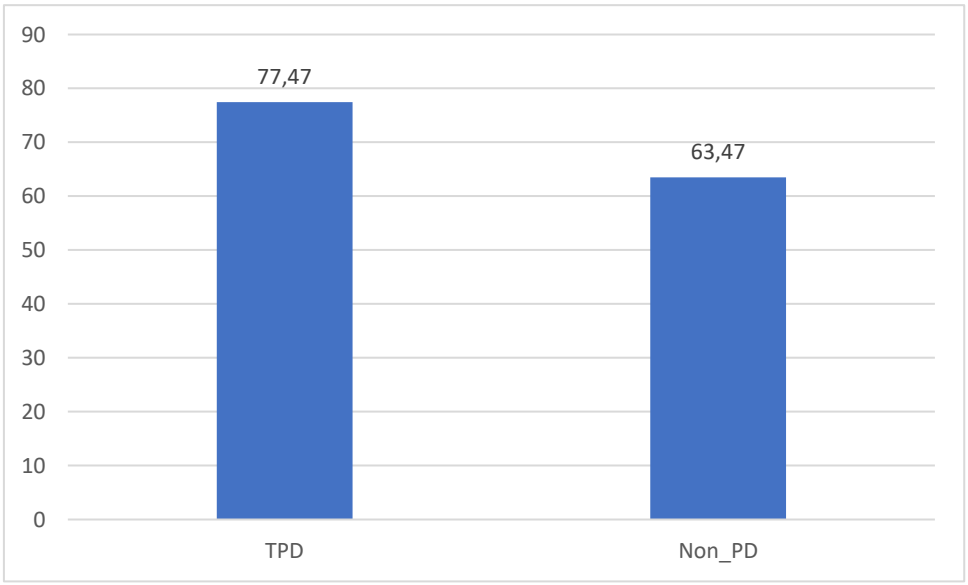

Figure 4.3 Comparison between TPD and Non-TPD

4.1.2 Inferential Statistic

Before conducting inferential statistical tests, a series of classical assumption tests will be performed to ensure that the research data meets the necessary assumptions. The normality test is the first assumption test.

1. **Normality Test**

Based on the Shapiro-Wilk test results in the table 4.6, it can be concluded that the data from both groups, TPD and Non-TPD, are normally distributed. This can be seen from the significance values (Sig.) of each group, which are greater than 0.05. The Sig. value for the TPD group is 0.597 and for the Non-TPD group is 0.483. Because both values exceed the significance threshold of 0.05, the assumption of normality is fulfilled, allowing researchers to proceed with parametric inferential statistical analysis in the next stage.

Tabel 4.6 Normality Test

	Shapiro-Wilk		
	Statistic	df	Sig.
TPD	0,954	15	0,597
Non-TPD	0,947	15	0,483

Based on the Normal Q-Q Plot for the TPD group in the figure 4.4, it can be seen that most of the data points are scattered along the diagonal line, although there are slight deviations at the bottom. This pattern indicates that the data distribution is close to a normal distribution. This result is in line with the Shapiro-Wilk test, which produced a significance value of 0.597 (> 0.05), so it can be concluded that the TPD group data is normally distributed and meets the assumptions for statistical analysis.

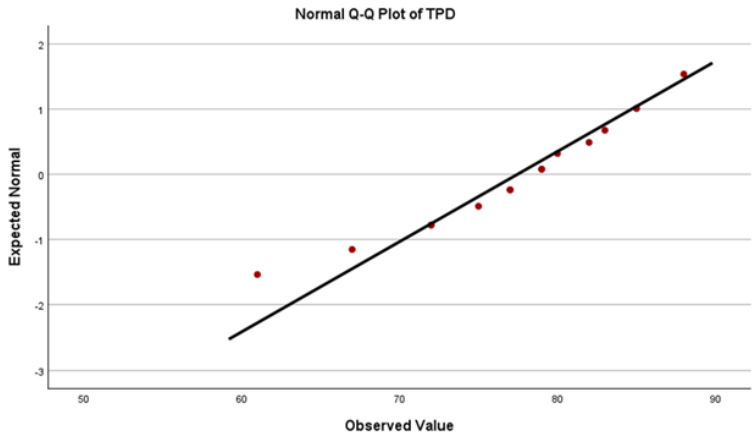

Figure 4.4 Normal Q-Q Plot of TPD

The Normal Non-TPD Q-Q Plot 4.5 below shows that the data points are scattered around the diagonal line, indicating that the distribution of Non-TPD variable data is almost the same as the normal distribution. This data can be considered to meet the assumption of normality even though there are some deviations on the upper and lower lines, but these deviations are still within reasonable limits. Therefore, variables that do not have TPD are suitable for further analysis.

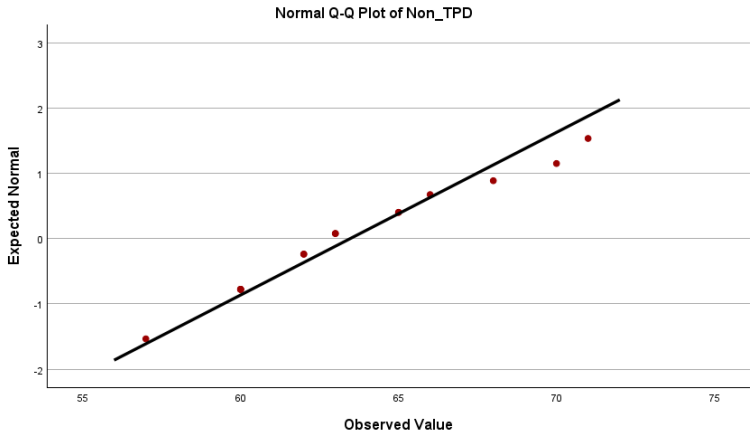

Figure 4.5 Normal Q-Q Plot of Non-TPD

2. Homogeneity Test

The homogeneity test in the table 4.7 presents the results of the Variance Homogeneity Test using Levene's Statistic to examine whether the data variation from the two groups (PD and Non-TPD) is equivalent. The most important result to note is the significance value (Sig.) listed in the rightmost column. The Sig. value obtained is 0.089. Since this value is greater than the standard limit of 0.05, it can be concluded that the variances of the two groups are homogeneous. This means that the level of dispersion or diversity of data in the two groups does not differ significantly. This result is an important finding because it fulfills one of the key assumptions required to continue data analysis with parametric statistical tests, such as the Independent Samples t-test.

Table 4.7 Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Result	Based on Mean	3,114	1	28	0,089
	Based on Median	2,610	1	28	0,117
	Based on Median and with adjusted df	2,610	1	20,506	0,121
	Based on trimmed mean	3,031	1	28	0,093

4.1.3 Hypothesis Testing

According to the independent sample test table 4.8, the significance result (Sig. Two-Sided p) is 0.000. Based on statistical criteria, the null hypothesis (Ho) is rejected if the sig. value is less than 0.05. This is because the value 0.000 is clearly less than 0.05. We accept the alternative hypothesis, which states that there is a

significant difference between the means of the two groups, by rejecting Ho. This shows that the Teacher Professional Development (TPD) program has a significant effect on learning effectiveness. The different results in the data are the result of the TPD program intervention, not just coincidence.

Tabel 4.8 Hypothesis Testing

		T-test for Equality of Means							
		T	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				One-Sided p	Two-Sided p			Lower	Upper
Result	Equal variances assumed	6,550	28	0,000	0,000	14,000	2,137	9,622	18,378
	Equal variances not assumed	6,550	21,869	0,000	0,000	14,000	2,137	9,566	18,434

4.1.4 Effect size

There is a possibility that the Teacher Professional Development (TPD) program has a significant impact on learning outcomes, as shown by the independent sample effect size table 4.9 below. This is indicated by a Cohen's d estimate of 2.392. Based on general standards, a Cohen's d value above 0.80 indicates a significant effect, and a value of 2.392 above that number indicates that the difference between the TPD and Non-TPD groups has significant practical meaning in addition to being statistically significant. Therefore, these findings indicate that PD program interventions are highly effective in improving teaching quality, which has a major impact on student learning outcomes.

Tabel 4.9 Effect Size

Independent Samples Effect Sizes					
		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Result	Cohen's d	5,854	2,392	1,430	3,328

Based on the figure 4.6, the results of the effect size analysis a Cohen's d value of 2.392 was obtained, indicating a very large difference between the TPD and Non-TPD groups (mean difference = 35.9). The distribution of the two groups showed only 23.2% overlap, meaning that most of the TPD group data did not overlap with the Non-TPD group. Cohen's U_3 value of 99.2% indicates that almost all participants in the TPD group had higher scores than the Non-TPD group. In addition, the probability of superiority of 95.5% shows a very high chance that individuals randomly selected from the TPD group will obtain better scores than individuals from the Non-TPD group. Meanwhile, the Number Needed to Treat (NNT) value of 1.35 indicates that by involving only about one to two people in the TPD program, a significant difference in learning outcomes compared to the Non-TPD group can already be seen.

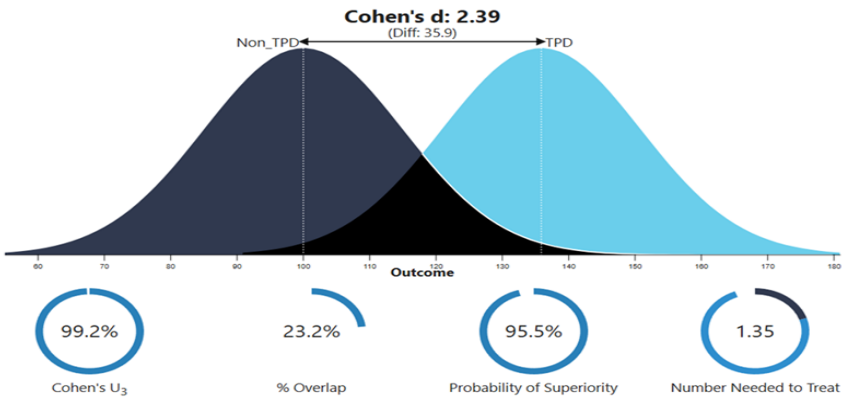

Figure 4.6 Effect size

4.2 Discussion

The results of this research indicate that, in terms of teaching effectiveness, there is a significant difference between teachers who participated in the Teacher Professional Development (TPD) program and those who did not. With a significance value of 0.000 (< 0.05) in the independent t-test sample, the null hypothesis (H0) was rejected. Thus, it can be concluded that participation in TPD does have an impact on improving teaching effectiveness. The results of the effect size analysis, which show that the effect category is very large, with a Cohen's d value of 2.39, support this finding. This means that the difference made is not only statistically significant but also has significant practical consequences in terms of education.

These results are similar to the research by Bowman et al. (2022), which found that teachers' exposure to professional development programs directly contributes to an increase in the use of more effective learning strategies in the classroom. Similarly, research by Lesmana (2023) in Indonesia found that continuous teacher training and development can improve teacher professionalism while also improving the quality of learning. This shows that TPD not only provides new knowledge but also changes teachers' teaching practices to be more varied, responsive, and student-centered. In addition, with a 95.5% probability of superiority in this research, there is a high possibility that teachers who participate in TPD teach better than those who do not. These results are also consistent with research conducted by Brandisauskiene et al (2020), which emphasizes that teachers' continuous involvement in TPD can improve the quality of learning in the

classroom. The TPD program helps teachers become smarter, more collaborative, and more innovative in managing learning.

The results of this study indicate that there is a significant difference in teaching effectiveness between teachers who participated in the Teacher Professional Development (TPD) program and those who did not. This finding is consistent with the study by Suhandoko et al. (2024), which emphasized the importance of TPD as a strategy for improving teacher professionalism in Indonesia. Based on the 2018 TALIS data, they found that TPD programs not only focus on instructional skills but also on strengthening collaboration among teachers, school principals, and educational partners. The findings of Rasmitadila et al. (2025) show that professional development programs for teachers in Indonesia significantly contribute to improving teachers' pedagogical, professional, and social competencies. These findings support the results of this study, in which participation in TPD was proven to enhance teaching effectiveness. Furthermore, Rasmitadila et al. emphasized the importance of sustaining professional development programs with the support of the government and educational institutions so that the benefits of TPD can have a broader impact on the quality of teaching and student learning outcomes.

. In addition, the results indicate that TPD programs can play a strategic role in improving the quality of education. To make TPD more impactful in various educational contexts, including remote areas, educational institutions and governments must support the sustainability of TPD programs. This is because teachers who regularly participate in professional development programs have been

shown to improve the quality of their teaching, which in turn can contribute positively to student learning outcomes. Therefore, it can be concluded that TPD is not only an effective tool for enhancing teacher performance but also a key driver for long-term improvements in educational quality and student achievement.

CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The purpose of this research was to determine whether there was a significant difference in teaching effectiveness between teachers who participated in the Teacher Professional Development (TPD) program and those who did not. It was proven that TPD had a significant effect on teaching quality. The results of the independent t-test showed that the null hypothesis (H0) was rejected and the alternative hypothesis (H_1) was accepted, with a significance value of 0.000 (< 0.05). As a result, teachers who participated in TPD had better learning outcomes than teachers who did not participate. With a Cohen's d value of 2.39, the strength of TPD's influence falls into the category of a very large effect, indicating that TPD not only has a statistically significant effect, but also a practical significance in improving teaching quality. Compared to teachers who did not participate in TPD, teachers who participated in TPD demonstrated better performance in terms of lesson planning, classroom management, teaching implementation, and professional responsibility. This shows that continuous professional training and development are very important for building innovative, efficient, and student-centered teaching practices.

In addition, this study shows that TPD programs improve teacher professionalism, peer collaboration, and reflective practices. Ultimately, this results in a better learning environment for students. Overall, this study suggests that teacher professional development plays a strategic role in improving teaching

effectiveness. Therefore, teacher professional development should be considered an important part of efforts to improve the quality of education, especially in areas with limited educational resources.

5.2 Recommendation

Based on the above conclusions, several recommendations can be made as follows:

1. **For Teachers**

Teachers are expected to take a more active part in professional development programs such as workshops, peer coaching, and peer observation. Continuous learning and self-reflection will help teachers improve their teaching and become more responsive to students' needs.

2. **For Schools and Educational Institutions**

Schools and educational institutions must provide full support by giving teachers ample opportunity to participate in TPD programs. In addition, teachers must collaborate in professional learning communities to create a reflective and supportive work environment.

3. **For Governments and Policymakers**

Governments and policymakers should create sustainable, accessible, and equitable TPD programs for teachers in both urban and remote areas. All teachers should receive the same incentives, facilities, and opportunities to reduce disparities in education quality.

4. For Further Researchers

Further research should expand the sample size and include a more diverse range of education levels. In addition, subsequent studies could investigate the impact of TPD on teaching effectiveness, student learning outcomes, teacher motivation, and long-term professional development.

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APPENDICES

Title : The Impact of Teacher Professional Development on Teaching Effectiveness: A Comparative Study

Objective: This rubric is four assessing teaching effectiveness

Appendix 1. Rubrik scale for classroom observation. Adapted by Danielson

No	Indicators	Level I Unsatisfactory	Level II Basic	Level III Proficient	Level IV Distinguished
Domain I. Planning and Preparation					
1	Demonstrating knowledge of content and pedagogy	The teacher lacks a strong grasp of the subject, struggles to correct student mistakes, and has a limited range of teaching methods.	The teacher knows the concepts but not their relationships. Their understanding of prerequisite knowledge is inaccurate, and they use a limited range of teaching methods.	The teacher has a strong grasp of the subject, understanding the key concepts, how they relate, and the necessary prerequisite knowledge. They also use a wide variety of effective teaching methods.	The teacher demonstrates a deep and interconnected understanding of the subject and its prerequisites, even anticipating student misconceptions. They are also adept at using a wide range of effective pedagogical approaches.
2	Demonstrating knowledge of studies	The teacher shows little understanding of how students learn, their diverse backgrounds, and their individual needs, and doesn't see this knowledge as important.	The teacher generally understands how students learn and their diverse backgrounds, but often applies this knowledge to the class as a whole, rather than to individual students.	The teacher understands the active nature of student learning and intentionally gathers information about the development levels, diverse learning approaches, skills, special needs, and cultural backgrounds of student groups.	Teachers understand how students learn and systematically gather information about each student's individual progress, needs, and background.
3	Planning and preparation	The learning outcomes are low, lack rigor, and focus more on activities than	The learning objectives are quite rigorous and have high	Learning objectives are strong and focused on outcomes that matter to	Learning objectives are clear, rigorous, and focused on student

		actual learning. They are limited to a single subject, discipline, and type of learning, making them unsuitable for all students.	expectations. However, the objectives are not coordinated and are only suitable for most students.	students. They cover a wide range of learning types, are measurable, and are tailored to different groups of students.	outcomes. They encompass a variety of learning types, are coordinated and integrated, and are tailored to each student individually.
4	Demonstrating Knowledge of Resources	Teachers are unaware of resources outside of school materials that can support student learning or their own professional development.	Teachers are aware of some resources outside of school, but do not seek to expand their knowledge.	Teachers recognize and seek resources outside of school, including from the internet, for learning and self-development.	Teachers have extensive knowledge of learning resources and self-development from schools, communities, professional organizations, universities, and the internet.
5	Designing Coherent Instruction	Learning activities are misaligned with objectives, lack structure, fail to engage students, have unrealistic timing, and use unsuitable, unvaried groupings.	Some activities align with goals and offer moderate challenge, but lack differentiation. Grouping is somewhat supportive, and the lesson has structure, though progression and timing are inconsistent.	Most learning activities align with goals, are well-structured, cognitively challenging, have appropriate timing, and include some differentiation and group variety.	Activities are well-sequenced, goal-aligned, engaging, highly challenging, differentiated, and use varied groupings with some student choice.
6	Designing Student Assessments	Assessment does not match goals, lacks criteria, and excludes formative evaluation.	Assessment partly matches goals, with unclear criteria and limited formative use.	Assessment aligns with all goals, uses clear criteria, is adapted for student groups, and includes a strong formative strategy.	Assessment fully aligns with goals, uses clear criteria, involves students, is adapted as needed, and includes effective use of formative data by both teacher and students.
Domain 2. The Classroom Environment					
1	Creating an environment of respect and apport	In class, teachers do not address negative interactions, inappropriate age or cultural references, and teasing.	Classroom interactions are generally appropriate, but sometimes inconsistent or insensitive. Students are rarely disrespectful, and	Students and teachers interact well and respect each other, teachers handle disrespect well, and the atmosphere remains polite and formal. All of this happens even	Good, friendly, and caring interactions in the classroom make students feel valued and encourage them to take intellectual risks.

			teachers respond unevenly, resulting in a neutral atmosphere without conflict or warmth.	though students carefully take intellectual risks.	
2	Establishing a culture for leaning	There is no commitment in class, students do not try hard enough, hard work and thoroughness are not valued, and only a few students achieve good results.	There is no commitment in class culture, teachers only perform their duties, students focus on tasks that lack quality, and success is considered a matter of talent.	Interaction supports hard work and linguistic accuracy, and the classroom culture values high standards for learning.	Students are responsible for improving quality and helping each other, teachers set high expectations and hard work, and an active classroom culture.
3	Managing classroom procedures	Students and supporters do not understand tasks, routines are ineffective, transitions, materials, and group management are unclear, and much time is wasted on learning.	Some time is spent on learning due to ineffective routines, inconsistent management, and the need for guidance from students and supporters.	With effective routines, teachers who consistently manage the classroom, students who independently follow the rules, and good support, learning time is not wasted.	Students can maximize their study time with effective routines; they can manage activities and resources independently; and supporters can contribute independently.
4	Managing student behavior	There are no clear rules of conduct, teachers rarely supervise, and misbehavior is dealt with by suppressing and disrespecting students.	Although behavioral standards exist, they are applied inconsistently. Teachers monitor and respond to misbehavior, which results in uneven outcomes.	Student behavior is generally good; teachers supervise according to standards; and their responses to misbehavior are consistent, proportionate, and effective.	Student behavior is good overall; they actively monitor themselves and their peers; teachers monitor carefully and preventively, and they respond to misbehavior thoughtfully and respectfully.
5	Organizing physical space	An unsafe classroom environment, students with limited access to lessons, and a layout and resources that are not suited to learning activities are all problems.	Classrooms are safe, learning is accessible to most students, and teachers have modest resources, and adjustments to space or lessons are ineffective.	Classrooms are safe, students have equal access, teachers organize space for activities, and resources are used well.	In a safe and inclusive classroom, all students can learn. Teachers and students work together to effectively utilize and organize space and resources to support learning.
Domain 3 Instruction					
1	Communicating with students	Students become confused, learning objectives are unclear, instructions are	Confusing instructions, unclear learning objectives,	Students are engaged, objectives are clear, instructions are easy to	Goals in line with the curriculum and students' interests, clear

		confusing, teachers' explanations are full of errors, and language is inappropriate.	correct but limited language, incorrect and difficult-to-follow explanations, and teachers rarely explaining academic vocabulary.	follow, strategies are taught, explanations are accurate and relevant to students, and academic vocabulary is used correctly.	instructions, in-depth explanations, students actively expanding their knowledge and vocabulary, teachers improving understanding with expressive language.
	Using questioning and discussion techniques	Teachers only asked simple questions with one answer, discussions were one-way question-and-answer sessions, and student contributions were accepted without explanation. In addition, only a few students participated in activities.	Teachers ask limited questions, few students participate, and efforts to encourage all students to think are still uneven.	Teachers ask questions that encourage thinking, allow time for response, create discussion, challenge students to explain their answers, and successfully engage most students with a variety of strategies.	Teachers challenge students with a variety of questions, students actively ask questions, discuss, challenge each other, and ensure that all voices are heard.
3	Engaging students in learning	Assignments, materials, and learning resources are not in line with the objectives, only requiring memorization, inappropriate grouping, and lessons without a clear structure and inappropriate tempo.	The lesson structure is there, but the pace is limited, tasks and activities are only partially in line with the objectives, many students are passive, and little thinking is required.	Tasks and activities are purposeful, challenge students to think, encourage active engagement with teacher support, appropriate grouping, clear structure, and appropriate learning pace.	Almost all students were actively engaged in challenging tasks, teachers provided support and challenges, students took the initiative to ask questions and help each other, with a clear structure and pace that supported understanding.
4	Using assessment instruction	Students are unaware of assessment criteria, learning is rarely monitored, feedback is minimal, and there is no self-assessment or peer assessment.	Students only know some of the criteria, teachers monitor in general, assessment is rarely used, and few students assess themselves.	Students know the criteria, teachers monitor each group, regular assessments are used, specific feedback is provided, and some students assess themselves.	Fully integrated assessment, students know and help develop criteria, regular individual assessment, specific feedback from teachers and peers, student self-assessment, and teachers tailor learning to individual needs.
5	Demonstrating flexibility and responsiveness	Teachers do not answer students' questions, blame students or their environment, or change the material when students fail to understand it.	Teachers are responsible for student success, but strategies are limited and	Teachers respond to students' questions, use a variety of strategies, help students who are	Teachers use opportunities to learn, employ various strategies, adapt learning to meet students'

			lesson adjustments are ineffective.	struggling, and adapt lessons smoothly.	needs, and seek additional resources to help students.
Domain 4 Professional Responsibilities					
1	Reflecting on teaching	Teachers do not know the effectiveness of lessons, misjudge success, and have no suggestions for improvement.	Teachers provide general recommendations for improvement and have a good understanding of lesson performance.	Teachers assess the effectiveness of learning, relate it to the achievement of objectives, and provide specific recommendations for improvement.	Using specific examples, teachers assess the effectiveness of learning by measuring strengths and offering options for action along with the likelihood of success.
2	Maintaining accurate records	Using specific examples, teachers assess the effectiveness of learning by measuring strengths and offering options for action along with the likelihood of success.	Teacher record keeping is still rudimentary, ineffective, and prone to error without regular supervision.	The teacher recording system is fully effective.	An effective teacher recording system, with students contributing to data maintenance.
3	Communicating with families	Teachers provide minimal information about programs and student progress, and are unresponsive to parents' concerns.	Teachers sometimes communicate about programs and student progress, but they do not involve families and are not culturally sensitive.	Teachers frequently provide information about the program and student progress in a culturally sensitive manner and strive to involve families.	Teachers frequently communicate with families in a culturally sensitive manner, involve students, respond professionally, and successfully engage families in the program.
4	Participating in the professional community	Teachers are negative, reluctant to cooperate, and avoid involvement in professional culture and school activities.	Teachers maintain good relations as necessary and participate in professional culture and school activities only when asked.	Teachers collaborate well, are active in the professional culture, and voluntarily contribute significantly to school and district activities.	Teachers collaborate, take initiative in leadership, foster a professional culture, and actively contribute and lead in school and district activities.
5	Growing and developing professionally	Teachers do not develop themselves, reject input, and do not share knowledge or professional responsibilities.	Teachers are limited in participating in professional activities, discussions, receiving feedback, and assisting colleagues.	Teachers actively develop themselves, engage in discussions and receive feedback, as well as assist colleagues and contribute to the profession.	Teachers actively develop themselves, conduct action research, seek feedback, and initiate contributions to the profession.

6	Showing professionalism	Teachers are dishonest, neglectful of students' needs, self-centered, and do not comply with school or district rules.	The teacher is honest, but efforts to serve students have not been consistent, decisions are still limited, and reminders are needed to comply with school and district rules.	Teachers who are honest, have integrity, actively serve students, are open in decision-making, and comply with school and district rules.	Teachers with high integrity, proactively serving students, opposing negative practices, leading decision-making, and complying with and setting an example for school and district rules.

Appendix 2. Observation Sheet

Objective: To evaluate the teachers' ability in planning and preparation of instruction

Name **:_____**

Group **: Followed PD Program/Unfollowed**

Name of School **:_____**

No	Domain	Indicators	Result
1.	**Domain I. Planning and Preparation**	Demonstrating knowledge of content and pedagogy	
		Demonstrating knowledge of studies	
		Planning and preparation	
		Demonstrating Knowledge of Resources	
		Designing Coherent Instruction	
		Designing Student Assessments	
2.	**Domain 2. The Classroom Environment**	Creating an environment of respect and apport	
		Establishing a culture for leaning	
		Managing classroom procedures	
		Managing student behavior	
		Organizing physical space	
3.	**Domain 3 Instruction**	Communicating with students	
		Using questioning and discussion techniques	
		Engaging students in learning	
		Using assessment instruction	
		Demonstrating flexibility and responsiveness	
4.	**Domain 4 Professional Responsibilities**	Reflecting on teaching	
		Maintaining accurate records	
		Communicating with families	
		Participating in the professional community	
		Growing and developing professionally	
		Showing professionalism	

Appendix 2. Observation Sheet

Objective: To evaluate the teachers' ability in planning and preparation of instruction

Name : [redacted]

Group: ~~Followed PD Program~~/Unfollowed

Name of school : [redacted]

No	Domain	Indicators	Result
1.	**Domain I. Planning and Preparation**	Demonstrating knowledge of content and pedagogy	4
		Demonstrating knowledge of studies	3
		Planning and preparation	4
		Demonstrating Knowledge of Resources	3
		Designing Coherent Instruction	4
		Designing Student Assessments	2
2.	**Domain 2. The Classroom Environment**	Creating an environment of respect and apport	4
		Establishing a culture for leaning	3
		Managing classroom procedures	2
		Managing student behavior	3
		Organizing physical space	2
3.	**Domain 3 Instruction**	Communicating with students	4
		Using questioning and discussion techniques	3
		Engaging students in learning	4
		Using assessment instruction	3
		Demonstrating flexibility and responsiveness	3

4.	**Domain 4 Professional Responsibilities**	Reflecting on teaching	3
		Maintaining accurate records	2
		Communicating with families	3
		Participating in the professional community	4
		Growing and developing professionally	4
		Showing professionalism	4

Appendix 2. Observation Sheet

Objective: To evaluate the teachers' ability in planning and preparation of instruction

Name : [redacted]

Group: ~~**Followed PD Program**~~**/Unfollowed**

Name of school : [redacted]

No	Domain	Indicators	Result
1.	**Domain I. Planning and Preparation**	Demonstrating knowledge of content and pedagogy	4
		Demonstrating knowledge of studies	3
		Planning and preparation	4
		Demonstrating Knowledge of Resources	3
		Designing Coherent Instruction	4
		Designing Student Assessments	2
2.	**Domain 2. The Classroom Environment**	Creating an environment of respect and apport	4
		Establishing a culture for leaning	3
		Managing classroom procedures	2
		Managing student behavior	3
		Organizing physical space	2
3.	**Domain 3 Instruction**	Communicating with students	4
		Using questioning and discussion techniques	3
		Engaging students in learning	4
		Using assessment instruction	3
		Demonstrating flexibility and responsiveness	3

4.	**Domain 4 Professional Responsibilities**	Reflecting on teaching	3
		Maintaining accurate records	2
		Communicating with families	3
		Participating in the professional community	4
		Growing and developing professionally	4
		Showing professionalism	4

Appendix 2. Observation Sheet

Objective: To evaluate the teachers' ability in planning and preparation of instruction

Name : [redacted]

Group: Followed PD Program/Unfollowed

Name of school : [redacted]

No	Domain	Indicators	Result
1.	**Domain I. Planning and Preparation**	Demonstrating knowledge of content and pedagogy	3
		Demonstrating knowledge of studies	4
		Planning and preparation	3
		Demonstrating Knowledge of Resources	3
		Designing Coherent Instruction	3
		Designing Student Assessments	3
2.	**Domain 2. The Classroom Environment**	Creating an environment of respect and apport	3
		Establishing a culture for leaning	3
		Managing classroom procedures	3
		Managing student behavior	3
		Organizing physical space	3
3.	**Domain 3 Instruction**	Communicating with students	3
		Using questioning and discussion techniques	3
		Engaging students in learning	3
		Using assessment instruction	3
		Demonstrating flexibility and responsiveness	3

4.	**Domain 4 Professional Responsibilities**	Reflecting on teaching	4
		Maintaining accurate records	3
		Communicating with families	3
		Participating in the professional community	3
		Growing and developing professionally	3
		Showing professionalism	4

Appendix 2. Observation Sheet

Objective: To evaluate the teachers' ability in planning and preparation of instruction

Name : [redacted]

Group: Followed PD Program/Unfollowed

Name of school : [redacted]

No	Domain	Indicators	Result
1.	**Domain I. Planning and Preparation**	Demonstrating knowledge of content and pedagogy	3
		Demonstrating knowledge of studies	4
		Planning and preparation	4
		Demonstrating Knowledge of Resources	3
		Designing Coherent Instruction	3
		Designing Student Assessments	4
2.	**Domain 2. The Classroom Environment**	Creating an environment of respect and apport	3
		Establishing a culture for leaning	3
		Managing classroom procedures	4
		Managing student behavior	4
		Organizing physical space	3
3.	**Domain 3 Instruction**	Communicating with students	4
		Using questioning and discussion techniques	4
		Engaging students in learning	4
		Using assessment instruction	3
		Demonstrating flexibility and responsiveness	3

4.	**Domain 4 Professional Responsibilities**	Reflecting on teaching	9
		Maintaining accurate records	3
		Communicating with families	3
		Participating in the professional community	3
		Growing and developing professionally	3
		Showing professionalism	9

Appendix 3. Score from Classroom Observation

Rater 1; Teachers Unfollowed PD Program																						
No	Nama	SCORE																				
		Domain 1						Domain 2					Domain 3					Domain 4					
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**12**	**22**
1	Teacher 1	3	4	3	3	2	2	4	3	2	2	2	3	3	4	2	3	3	3	4	3	3	4
2	Teacher 2	3	3	3	3	3	3	4	3	3	1	2	3	4	3	2	2	2	3	4	3	2	1
3	Teacher 3	4	3	4	3	4	2	4	3	2	3	2	3	2	4	3	4	3	3	3	4	4	4
4	Teacher 4	3	3	3	3	3	2	2	2	3	2	2	3	3	2	1	2	2	3	4	3	3	3
5	Teacher 5	3	3	3	3	3	3	4	3	2	2	2	4	3	3	2	2	2	2	4	3	2	2
6	Teacher 6	4	3	3	2	2	3	2	2	2	2	3	4	4	3	2	3	1	3	4	3	3	2
7	Teacher 7	4	3	3	2	3	4	3	3	3	2	2	3	3	4	4	3	3	2	2	3	2	2
8	Teacher 8	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
9	Teacher 9	3	3	3	4	3	3	3	3	3	3	3	3	4	4	3	4	3	3	2	2	2	2
10	Teacher 10	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2
11	Teacher 11	3	3	3	4	3	3	2	3	3	3	3	3	4	4	4	3	4	3	3	3	2	2
12	Teacher 12	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2
13	Teacher 13	3	3	3	2	2	2	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	2
14	Teacher 14	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	4	2	2	2
15	Teacher 15	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Rater 1; Teacher Followed PD Program																							
No	**Nama**	**SCORE**																					
		Domain 1						**Domain 2**					**Domain 3**					**Domain 4**					
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
1	Teacher 16	4	4	4	4	4	4	3	3	3	4	3	4	4	4	3	3	3	3	4	3	4	4
2	Teacher 17	4	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	4	3	4	4	4	4
3	Teacher 18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	Teacher 19	4	4	4	4	4	4	4	2	3	4	3	3	4	3	3	3	3	4	4	3	3	2
5	Teacher 20	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	4	3	3	3
6	Teacher 21	3	3	2	2	2	2	2	3	3	3	3	4	3	3	3	3	2	3	3	3	3	3
7	Teacher 22	3	3	4	3	3	4	4	4	3	4	4	4	3	3	3	3	2	3	3	3	3	3
8	Teacher 23	4	4	4	3	4	4	4	4	4	4	3	4	4	4	4	4	4	3	4	4	3	3
9	Teacher 24	4	4	4	3	3	4	4	4	4	4	3	4	4	4	4	4	4	3	4	3	3	4
10	Teacher 25	4	3	3	4	4	3	4	4	3	4	3	4	4	3	3	3	4	3	4	3	3	4
11	Teacher 26	3	4	4	3	3	4	3	3	4	4	3	4	4	4	4	3	3	4	3	3	3	4
12	Teacher 27	3	4	4	3	3	4	4	4	4	3	4	4	4	4	4	4	3	3	4	2	4	3
13	Teacher 28	3	4	4	3	4	4	4	4	4	4	4	4	4	4	4	3	3	4	3	3	3	3
14	Teacher 29	3	3	3	4	2	4	3	3	3	4	3	4	3	4	3	3	4	3	4	3	3	3
15	Teacher 30	4	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	4	3	4	4	4	4

Rater 2; Teachers Unfollowed PD Program																							
No	Nama	SCORE																					
		Domain 1						Domain 2					Domain 3					Domain 4					
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
1	Teacher 1	3	3	3	2	2	2	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	2
2	Teacher 2	3	3	3	3	2	3	2	2	2	2	3	4	3	2	1	3	2	2	4	3	2	2
3	Teacher 3	4	3	4	3	4	3	2	4	4	3	2	3	2	4	3	4	3	3	3	2	3	4
4	Teacher 4	3	3	3	3	3	2	2	2	2	2	2	4	3	2	1	3	1	3	4	3	3	2
5	Teacher 5	2	2	2	3	3	2	3	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2
6	Teacher 6	4	2	2	2	2	2	2	2	2	2	2	3	3	3	2	3	1	2	3	3	2	1
7	Teacher 7	3	3	3	4	3	3	2	3	3	3	3	3	4	4	4	3	4	2	3	2	2	2
8	Teacher 8	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
9	Teacher 9	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2
10	Teacher 10	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2
11	Teacher 11	3	3	3	4	3	3	2	3	3	3	3	3	4	4	4	3	4	3	3	2	2	2
12	Teacher 12	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2
13	Teacher 13	3	3	3	2	2	2	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	2
14	Teacher 14	3	3	3	2	2	3	2	2	3	3	3	3	3	3	3	3	3	3	4	2	2	2
15	Teacher 15	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Rater 2; Teachers Followed PD Program																							
No	Nama	Score																					
		Domain 1						Domain 2					Domain 3					Domain 4					
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
1	Teacher 16	4	4	4	4	4	4	3	3	3	4	3	4	4	4	3	3	3	3	4	3	4	4
2	Teacher 17	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	4	3	3	4	4
3	Teacher 18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	Teacher 19	4	4	4	4	4	4	4	2	3	4	3	3	4	3	3	3	3	4	4	3	3	2
5	Teacher 20	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	4	3	3	3
6	Teacher 21	3	3	2	2	2	2	2	3	3	3	3	4	3	3	3	3	2	3	3	3	3	3
7	Teacher 22	3	4	3	3	3	3	3	3	4	4	4	4	3	3	3	2	2	3	3	3	2	2
8	Teacher 23	4	4	4	3	4	3	4	3	3	3	3	3	3	3	3	3	3	3	2	3	4	4
9	Teacher 24	4	4	4	3	3	4	4	4	4	4	3	4	4	4	4	4	4	3	4	3	3	4
10	Teacher 25	4	3	3	4	4	3	4	4	3	4	3	4	4	3	3	3	4	3	4	3	3	4
11	Teacher 26	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	4
12	Teacher 27	3	4	4	3	3	4	4	4	3	3	3	4	4	4	4	4	3	3	4	3	3	3
13	Teacher 28	4	3	3	3	3	4	3	3	3	3	3	3	3	4	4	3	3	2	2	3	2	2
14	Teacher 29	3	3	4	3	2	4	3	3	4	3	4	3	4	3	3	3	4	3	4	3	3	3
15	Teacher 30	4	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	4	3	4	4	4	4

Appendix 4. Output of Statistical Analysis

ReliabilityTest

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Measure of Agreement	Kappa	0,439	0,095	10,774	0,000
N of Valid Cases		30			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					

Descriptive Statistic of TPD

Statistics		
TPD		
N	Valid	15
	Missing	0
Mean		77,47
Median		79,00
Mode		72[a]
Std. Deviation		7,239
Sum		1162
a. Multiple modes exist. The smallest value is shown		

Frequency of TPD

TPD					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	61	1	6,7	6,7	6,7
	67	1	6,7	6,7	13,3
	72	2	13,3	13,3	26,7
	75	1	6,7	6,7	33,3
	77	2	13,3	13,3	46,7
	79	2	13,3	13,3	60,0
	80	1	6,7	6,7	66,7
	82	1	6,7	6,7	73,3
	83	1	6,7	6,7	80,0
	85	2	13,3	13,3	93,3
	88	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

Descriptive Statistic of Non-TPD

Statistics		
Non_TPD		
N	Valid	15
	Missing	0
Mean		63,47
Median		63,00
Mode		60
Std. Deviation		4,015
Sum		952

Frequency of Non-TPD

Non_TPD					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	57	1	6,7	6,7	6,7
	60	4	26,7	26,7	33,3
	62	2	13,3	13,3	46,7
	63	2	13,3	13,3	60,0
	65	2	13,3	13,3	73,3
	66	1	6,7	6,7	80,0
	68	1	6,7	6,7	86,7
	70	1	6,7	6,7	93,3
	71	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

Comparasion beween TPD and Non-TPD

Mean	
TPD	**Non_TPD**
77.47	**63.47**

Normality Test

Tests of Normality						
	Shapiro-Wilk			Kolmogrov-Smirnov		
	Statistic	df	Sig.	Statistic	df	Sig
TPD	0,954	15	0,597	0,141	15	.200*
Non_TPD	0,947	15	0,483	0,146	15	.200*
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Independent Samples Test

		t-test for Equality of Means							
		t	Df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				One-Sided p	Two-Sided p			Lower	Upper
Result	Equal variances assumed	6,550	28	0,000	0,000	14,000	2,137	9,622	18,378
	Equal variances not assumed	6,550	21,869	0,000	0,000	14,000	2,137	9,566	18,434

Tests of Homogeneity of Variances

Tests of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Result	Based on Mean	3,114	1	28	0,089
	Based on Median	2,610	1	28	0,117
	Based on Median and with adjusted df	2,610	1	20,506	0,121
	Based on trimmed mean	3,031	1	28	0,093

Effect Size

Independent Samples Effect Sizes					
		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Result	Cohen's d	5,854	2,392	1,430	3,328
	Hedges' correction	6,017	2,327	1,391	3,238
	Glass's delta	4,015	3,487	2,008	4,936

a. The denominator used in estimating the effect sizes.

Appendix 5 Documentaion