PYTHAGORAS: Jurnal Program Studi Pendidikan Matematika, 14(2): 222-234
Oktober 2025
p-ISSN: 2301-5314
e-ISSN: 2615-7926

Learning how to teach: portrait of teaching skills of tadris mathematics students in microteaching courses

Ibnu Amirus Syahid[1*], Wiwin Astuti[2], Ari Wibowo[3]

[1,2,3]Tadris Matematika, UIN Raden Mas Said Surakarta, Jawa Tengah, Indonesia
[*]e-mail: syahidibnu369@gmail.com

Diserahkan: 01/08/25 Diterima: 04/11/25 Diterbitkan: 07/11/25

Abstract. Teaching skills are one of the essential competencies that education students must possess as prospective teachers. However, in reality, many students still struggle to implement teaching skills effectively during microteaching courses. This study aims to analyze the teaching skills of Tadris Mathematics students in microteaching courses. The method employed in this research is descriptive quantitative. Data were obtained from the assessment sheets of the lecturers who taught the microteaching course. The sample comprised all Tadris Mathematics students at UIN Raden Mas Said Surakarta, semester 6, who enrolled in microteaching courses, totaling 82 students divided into six classes. The results indicated that there are four indicators of teaching skills in the very good category, eight indicators in the good category, ten indicators in the adequate category, and three indicators in the poor category. Students demonstrated excellent opening and closing skills and demonstrated positive verbal and nonverbal performance, such as clear language use and an attractive appearance. However, they still needed reinforcement in developing HOTS skills, implementing the TPACK approach and problem or project based learning, and developing HOTS based assessments. Thus, there remains a dominance of teaching skill indicators that fall within the adequate and poor categories, highlighting the need for further intervention and improvement. Each student's teaching skills improved from the first to the third practice. The variation in teaching skills among students decreased, demonstrating that students' teaching skills became more uniform and stable. Most of the students fall into the good and very good categories. The development of students' teaching skills is supported by four vital principles in microteaching learning, namely the principle of practice, the principle of reinforcement, the principle of evaluation, and the principle of precision supervision. This research is expected to provide an understanding of the role of microteaching in shaping the teaching skills of prospective teachers and a basis for developing more effective microteaching strategies.

Keywords: learning evaluation, microteaching, teaching skills

Introduction

Education plays a strategic role in creating civilization and enhancing the quality of human resources (Halean et al., 2021). This is based on Article 3 Law Number 20 of 2003 concerning the National Education System. Education provides provisions in the form of knowledge, skills, and values needed to contribute to community life. In addition to the curriculum and facilities available, the quality of educators is also a determinant of educational success (Hidayat & Abdillah, 2019). Teachers have a fundamental function in realizing effective and meaningful learning for students (Mustafa, 2024). Therefore, teacher competence is one of the vital elements that contribute to determining the success of the educational process (Rahman, 2022).

Based on Article 10 Paragraph 1 Law (UU) Number 14 of 2005 concerning Teachers and Lecturers, a teacher is obliged to master pedagogic, personality, social, and professional

competencies. Teaching skills are a form of representation of the four competencies (Windiyani et al., 2020). According to Turney in Sukirman (2012) present eight basic teaching skills, including asking questions, giving reinforcement, holding variations, explaining, opening and closing lessons, guiding small group discussions, managing classes, and teaching small groups and individuals. Teaching skills can stimulate and influence students' motivation to learn (Arsana, 2020; Mustiko & Trisnawati, 2021; Purba et al., 2020). Thus, prospective educators need to have a good mastery of teaching skills.

Microteaching courses present as one of the ways applied in teacher education to train students' teaching skills (Fischetti et al., 2022; Sukirman, 2012). Microteaching is a forum for education students to practice teaching in small classes before facing a real class (Arsal, 2014; Sudarman & Elyawati, 2021). Students can get feedback on their performance, know their strengths and weaknesses, and practice mastery of teaching skills through several practices (Adi & Ambarini, 2025; Ro & Kim, 2024). Microteaching provides a positive influence that can improve students' teaching skills (Gafar et al., 2023; Widodo et al., 2021). Therefore, microteaching is an essential component in preparing competent teacher candidates (Ikrom & Rahayu, 2024).

Preliminary observations in several classes of students in the Tadris Mathematics study program show that students' teaching skills in microteaching courses vary. Some students showed their expertise in starting and closing learning activities by presenting a variety of icebreakers that aroused enthusiasm and attracted the attention of students. In addition, students also show their shrewdness in communicating by paying attention to verbal and non-verbal aspects that are seen when delivering learning materials. On the other hand, there are still students who look nervous, stammer, and are confused in simulating teaching activities. These findings indicate that not all students have shown optimal teaching skills and some aspects still need to be improved and further considered.

Several previous studies have revealed the implementation of microteaching in improving students' teaching skills. Studies conducted by Isnaniah & Imamuddin (2022) found that prospective mathematics teacher students have excellent skills in opening and closing lessons. Other research by Novianti & Khaulah (2022) expresses the need to improve speaking skills and close the lesson. Chera et al. (2022) in his research, it highlights that the skills of opening lessons, closing lessons, and giving reinforcement have not been applied optimally. In addition, research by Putra et al. (2024) shows that students are less skilled in guiding group discussions. Thus, further review is needed to find out in its entirety how the teaching skills of Tadris Mathematics students develop in the microteaching course.

Based on the results of previous observations and research, this study intends to analyze the development of teaching skills of students of Tadris Mathematics UIN Raden Mas Said Surakarta in microteaching. This study focuses on the variation and dynamics of teaching skill development from all practices as well as the categorical distribution of teaching skills. In addition, identification was carried out to find out the indicators of skills with good mastery and those that still need to be strengthened, so that they can provide input so that the next implementation of microteaching can be more optimal. This research is expected to provide a more comprehensive understanding of the role of microteaching in shaping the teaching skills of prospective teachers and provide recommendations for universities in developing microteaching curricula.

Research Methods

The type of research used is descriptive with a quantitative approach to describe the teaching skills of Tadris Mathematics students in microteaching courses. The research data was obtained from the student assessment sheets that have been carried out by the lecturer who teach the microteaching course which covers several aspects, such as the skills of opening and closing learning, presenting the material, applying models and methods, developing variations, class management, using learning media, communication and interaction with students, providing reinforcement, and implementing assessments. Each student did three teaching practices and received three assessment sheets.

The population in this study is all students of the Tadris Mathematics Department of UIN Raden Mas Said Surakarta, semester 6 of the 2024/2025 academic year, who are taking microteaching courses, with a total of 82 students divided into six classes. Sampling was carried out using the total sampling technique, so that all students in the population were used as research samples. Simple statistics, such as mean, percentage, and standard deviation are calculated to analyze the data descriptively. The results of this analysis are expected to show an overview of the level of students' teaching skills, including aspects that need to be improved in microteaching learning.

Results and Discussion

This study was conducted to examine the teaching skills of Tadris Mathematics students in microteaching courses based on the results of assessments from the teaching lecturers. The results of the overall assessment of the practices obtained were analyzed by calculating the average student scores from the three practices, the average per class, as well as the distribution of each student's grade categories and indicators. Standard deviations are also calculated to see the diversity of values between students in each practice. Bar charts are also used to visualize trends in teaching skill development and pie charts to visualize the percentage of grades categorically. This description is studied in more depth in the following sub-sections.

Analysis of Student Teaching Skills Indicators

Initial analysis was carried out on the achievement of each indicator of basic teaching skills. The results of this analysis are used to identify indicators of skills that have been mastered well and that are still lacking among students. These indicators refer to the assessment aspects contained in the microteaching practice assessment sheet prepared by the teaching lecturer. Based on the average scores obtained from all practices, each indicator is grouped into four levels, namely very good, good, adequate, and poor. The grouping is based on the following criteria.

Table 1. Categorization criteria for teaching skill assessment indicators

Range Value	Indicator Categorization Criteria
$X >$ Mean + 1 SD	Very Good
Mean $\leq X \leq$ Mean + 1 SD	Good
Mean − 1 SD $\leq X <$ Mean	Adequate
$X <$ Mean − 1 SD	Poor

Table 2. Categorization of teaching skill assessment indicators

Category	Average Indicator	Indicators
Very Good	3,93	Skilled in opening lessons with triggering questions and conducting initial assessments in learning readiness
	3,74	Good and correct use of language, both oral and written, following the subject taught
	3,95	Modesty in dress and/or charming appearance and full of soul calling
	3,79	Skilled in closing learning through inference activities, teacher and student reflection, and follow-up.
Good	3,55	Skilled at attracting and motivating students as well as understanding the meaningfulness of learning
	3,48	Implementing learning preparation steps by focusing on students
	3,53	Demonstrate the presentation of the material (describing the roundness of the concept of knowledge in the dimensions of factual, conceptual, procedural, and metacognition) and material advance
	3,6	Demonstrate synergistic presentation of material at each stage of learning (opening, core, and closing stages)
	3,55	Skilled in using learning media, both conventional and digital media
	3,63	Demonstrate voice clarity, such as volume, intonation, and diction in learning communication
	3,55	Demonstrate the ability to use nonverbal communication (gestures) in a learning setting
	3,54	Skilled in carrying out reinforcement and/or remedial/enrichment
Adequate	3,33	Skilled in using learning models, approaches, and methods that reflect the individual differences of each student, such as the application of differentiated learning
	3,41	Skilled at developing a variety of meaningful, challenging, and inspiring learning interactions
	3,31	Skilled in managing classes and learning climates based on the learning principles of the Independent Curriculum
	3,3	Demonstrate adaptability during the learning process based on the potential and diversity of student characteristics
	3,43	Skilled in organizing and utilizing learning resources and/or teaching materials for meaningful learning
	3,24	Skilled in using information and communication technology in application-based learning, such as Google Drive, Google Classroom, etc
	3,44	Demonstrate the ability to contextualize and integrate material in real life, oriented to the values of religious moderation
	3,4	Use of analogies/metaphors, stories, or parables in learning
	3,45	Creating a fun, communicative, critical, humanist, innovative, and collaborative learning atmosphere

Category	Average Indicator	Indicators
Poor	3,32	Skilled in conducting process assessments (Formative or Summative)
	3,07	Skilled in implementing educational learning with the approach of TPACK, PBL, PjBL, and related to independent learning
	3,14	Skilled in developing critical thinking, creative thinking, reflective thinking, and decision making skills in a learning environment
	2,88	Skilled in applying assessment instruments oriented towards achieving HOTS-based learning objectives

Based on Table 2 above, there are four indicators of being in the very good category, which shows that skill mastery in these aspects is very strong. One of these indicators is the skill in opening lessons with triggering questions and conducting initial assessments of learning readiness. This reflects students' understanding of the importance of giving an attractive impression at the beginning of learning and seeing the readiness of students to learn through initial assessments. In addition, students are also considered very skilled in using good and correct language as a verbal part of communication. This is reinforced by the nonverbal aspect of the next indicator, namely skill in dressing and appearance. The last indicator that is classified as very good is the skill of closing the lesson. This skill is realized through concluding the material, reflection of teachers and students, and follow-up on the learning that has been carried out. This is in line with previous research by Nurdian & Suma Setyawati (2025), Nurmasyitah (2021), dan Nurwahidah (2020) whichs found that students have skilled opening and closing skills in learning.

Meanwhile, eight other indicators are included in the good category. Some of these indicators include skills to attract attention and motivate students, prepare student-centered learning, present materials, utilize conventional and digital learning media, and provide reinforcement, remedial, and enrichment. In addition, students are also skilled in applying other verbal aspects in communication, such as clarity of volume, choice of intonation, and the use of diction. Followed by gestures, such as giving a thumbs up or clapping to liven up a fun learning atmosphere. Although these eight indicators provide good results, strengthening is still needed, especially in the consistency of implementing strategies to attract students' attention, optimal use of digital learning media, and effective use of verbal aspects and body movements to maintain student motivation and engagement.

Further, ten indicators fall into the adequate category. Some of the indicators in this category include skills in applying learning models, approaches, and methods according to the diverse characteristics of students, developing a variety of learning interactions, classroom management, and learning climate based on the Kurikulum Merdeka, and adaptive. In addition, the use of learning resources and the use of technology in learning also still needs to be developed. This is because some students are not skilled in utilizing existing learning resources for the realization of meaningful learning and incorporating technology to help the teaching

and learning process. Astuti et al. (2024) showed that although media such as PowerPoint and video have been widely used in microlearning, the use of more advanced technology is still low. Additionally, M. Astuti et al. (2024) emphasized that challenges such as the need for technological training are inhibiting factors in maximizing the use of digital learning resources.

Other indicators that need to be improved are the skills to apply contextual learning, use analogies, and conduct formative and summative assessments. In addition, students are not yet skilled in creating a learning atmosphere that is fun, communicative, critical, humanist, innovative, and collaborative. This indicates that even though they have been able to implement verbal and nonverbal communication, present material using good learning media, and can attract the attention of students, it turns out that the desired learning atmosphere is still not optimally realized. The explanation above shows that these ten indicators have begun to develop, but there are still some obstacles that emerged including students' limited experience in managing classes, designing formative and summative assessments, and implementing contextual learning, creating a learning environment that was enjoyable, communicative, critical, innovative, and collaborative. In line with Afriannisa et al. (2025) who revealed that the obstacles experienced by students were difficulties in managing time and not having sufficient insight into the methods, ways, and techniques that are effectively applied to the teaching and learning process in the classroom. Merdekawaty et al. (2024) added that students still face obstacles in implementing innovative learning strategies and difficulties in designing and implementing effective assessments.

The remaining three indicators are in the poor category. One of the indicators in this category is the skill of implementing educational learning with the approach of Technological Pedagogical Content Knowledge (TPACK), Problem-Based Learning (PBL), Project-Based Learning (PjBL), and related to independent learning. This indicates that students still have difficulties in incorporating technology in learning, as well as applying an exploratory approach based on problems or projects. In addition, another indicator that is included in the poor category is the skill of developing critical thinking, creative thinking, reflective thinking, and decision making skills in a learning environment because students do not have sufficient knowledge regarding the development of thinking skills for students and are not yet accustomed to it. This finding is in line with Nurdian & Suma Setyawati (2025) research which shows that students' questioning skills are still limited, most of the questions are closed or only test memory, so they rarely encourage students to think critically or reflectively.

Finally, students still have difficulties in implementing assessment instruments that are oriented towards achieving learning objectives based on Higher Order Thinking Skills (HOTS) which requires students to test students' understanding more deeply. This happens because students do not understand how to prepare assessment instruments that support students' high-level thinking. Thus, more in-depth interventions are needed in the form of learning design and simulation that focus on the various approaches above. Students also need to be given examples of assessment instruments that are prepared to measure students' high-level thinking skills. It is hoped that students will be able to teach more innovatively and meaningfully.

Analysis of Student Teaching Skills Development

The value data of each class was calculated on average to determine the development of each class's teaching skills in three practices. An overview of the results of the analysis of the average score of each class is presented in the following bar chart.

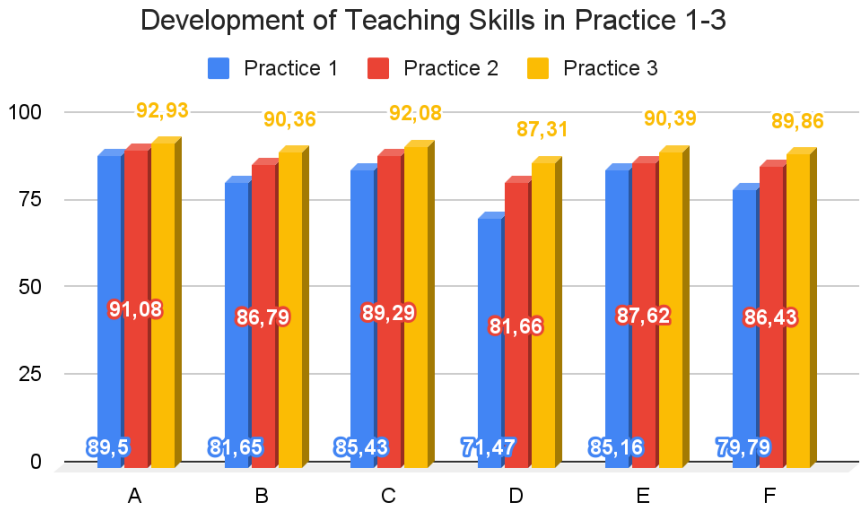

Figure 1. Practice teaching ability development diagram 1-3

Based on Figure 1, it can be seen that in general, all classes experienced an increase in teaching skills in microteaching courses from the first practice to the third practice. The visualization shown in the bar chart suggests that there has been a consistent pattern of improvement since the first practice. Class D experienced the highest increase, where the average student score rose dramatically from the first practice to the second practice, although it slowed down in the third practice. A fairly high increase was also shown by classes B and F from the first practice to the second practice, although it also slowed down slightly in the third practice. Classes C and E experienced a fairly stable initial increase and experienced relatively minor changes in subsequent practices.

The highest increase that occurred from the first practice to the second practice in some classes showed the adjustment and application of feedback from the teaching lecturer after the first practice. However, the improvement in grades decreased in almost all classes in the third practice. This shows that the stability of students' skills has begun to be achieved. The increase in class A was the smallest, while the average initial grade was the highest among the other five classes. This shows that students in that class have earlier teaching readiness than other classes. Based on the above explanation, it can be concluded that all classes have increased from the first practice to the third practice, which indicates the development of each student's teaching skills through microteaching courses.

Analysis of Variation in Students' Teaching Skills

In addition to paying attention to the average score of students in the three microteaching practices, standard deviation (SD) analysis was carried out to review the diversity of teaching

skills between students. The calculation results show the highest number of 10.59793944 as the SD in the first practice. This indicates that there is a considerable variety of skills among students at the beginning of the implementation of microteaching. This variation arises because not a few students have experience in teaching, while others do not have experience and need to adjust to the microteaching atmosphere. Furthermore, in the second practice, there was a decrease in the SD to 5.961740029. This indicates that after the first practice, students begin to be able to understand better aspects of teaching, especially after receiving feedback from the teaching lecturer or observing other students. However, the decrease in this variation in scores still shows a fairly prominent difference between students who still feel difficulties and students who are increasing rapidly.

In the third practice, the SD shows the lowest number of 4.166964759. This indicates that students' teaching skills are increasingly stable compared to previous practices. This figure hints at the achievement of a more uniform level of competency in most students. In addition, there are still groups of students who have difficulties in certain aspects of teaching skills, so they need additional learning support. So, the analysis of this SD underlines that the implementation of microteaching has a significant impact on the development of students' teaching skills. The alignment of skills is shown by the variation in values between practices which decreases. This indicates that students' teaching skills are increasingly uniform and honed as the teaching experience increases.

Categorical Analysis of the Distribution of Students' Teaching Skills

After analyzing the development of students' teaching skills in three practices, an analysis was carried out to find out the distribution of students' teaching skills categorically. Students are grouped into four categories, namely very good, good, adequate, and poor with the criteria as in Table 1. This grouping is presented in the following pie chart.

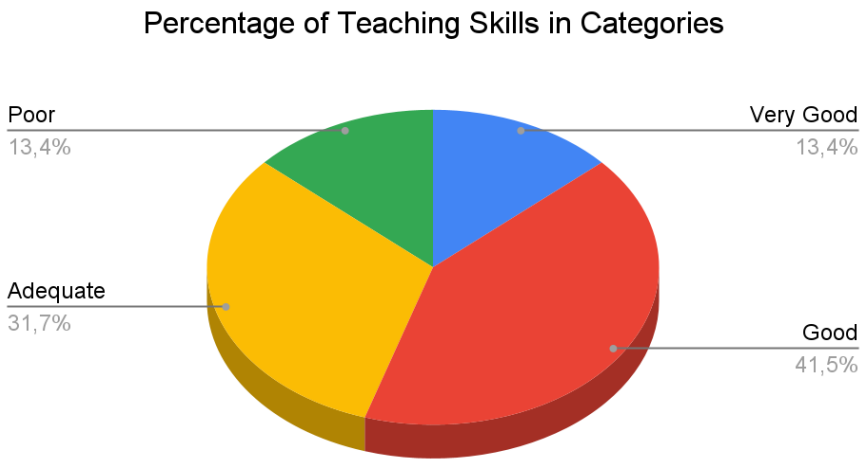

Figure 2. Teaching skill percentage chart categorically

Based on the visualization in the diagram above, it can be shown that from a total of 82 students, a total of 11 students (13.4%) are included in the very good category, which indicates optimal mastery of teaching skills in every aspect. Most of the students, namely 34 students (41.5%) were in the good category, which indicates good mastery of teaching skills, although there is still room for improvement in some aspects. Then, 26 students (31.7%) were in the

adequate category, while the remaining 11 students (13.4%) were still in the poor category, which indicates that students still have difficulties in applying optimal teaching skills.

The above presentation shows the dominance of students with fairly good teaching skills, as evidenced by the number of students who are in the good and very good categories of more than half. This shows the usefulness of microteaching in providing experience and fostering teaching skills for students (Afriannisa et al., 2025; Hasibuan & Wahyudi, 2025; Purwanti & Suhargo, 2024). On the other hand, there are still 45.1% of students who are included in the adequate and poor categories, which indicates that there is an imbalance in the mastery of teaching skills between students. Of course, this requires more attention and strengthening in many aspects, including the ability to apply learning models and approaches that are appropriate to student characteristics, utilize learning resources and technology, manage classes, conduct assessments, and develop thinking skills. These disparities can be minimized through thorough preparation, in-depth knowledge of the use of methods and techniques in learning, and training in media creation and assessment design (Afriannisa et al., 2025). In addition, an analysis is also needed to review things that affect the variation in students' teaching skills.

Dynamics of Teaching Skills Based on Microteaching Learning Principles

Students' teaching skills in microteaching demonstrate a dynamic pattern of development, in line with the principles of learning microteaching presented by Lakshmi in Arifmiboy (2019) like the principle of practice, the principle of reinforcement, the principle of evaluation, and the principle of precise supervision. One of the principles that is in line with the findings of this study is the principle of practice which is shown by the improvement of teaching skills from the first to the third practice through the habituation process. The opportunity to practice allows students to brush up on their teaching skills optimally, which is reflected in the increase in the average grades obtained. This suggests that learning microteaching is useful in providing experience and fostering teaching skills for students (Purwanti & Suhargo, 2024).

Not only that, but the essential role of the principle of reinforcement also affects student development. Students can feel helped by the feedback given by the lecturer because providing feedback after a microteaching session is an important part of the learning process (Afriannisa et al., 2025). Positive reinforcement tends to encourage students to be more confident and show improved performance in the next practice. This is also in line with the theory of learning behaviorism which emphasizes the importance of providing stimulus and reinforcement to get a better response (Telaumbanua, 2020). On the other hand, stagnation in skill development can arise if students lack reinforcement or deep reflection.

Further, the principle of evaluation is also an important component of learning microteaching. The process of identifying aspects of teaching skills that require improvement can be carried out with the help of evaluation by the lecturer, independent reflection, or open discussion (Afriannisa et al., 2025). Reflection and evaluation are used as a way to re-examine teaching practices to find areas that are less than optimal so that they can be improved (Amalia et al., 2024). The success of this evaluation can be seen from the difference in the distribution

of student scores which are increasingly centered on the good and adequate categories in three practices.

Furthermore, the principle of precise supervision states that students' understanding of technical and pedagogical aspects of microteaching can be improved through clearer and more targeted guidance (Lakshmi in Arifmiboy, 2019)The existence of systematic supervision allows students not only to practice but also to receive guidance that focuses more on certain aspects of teaching (Afriannisa et al., 2025). This principle implies that instead of relying solely on practice, the development of students' teaching skills also depends on the quality of guidance provided during the learning process microteaching walk.

The interconnectedness of this dynamic indicates that microteaching learning is not only about providing teaching experiences, but also a forum for students to cultivate teaching skills regularly through the process of training, feedback, evaluation, and supervision (Afriannisa et al., 2025). Thus, the optimization of microteaching learning can be applied by improving the mechanism of independent reflection, strengthening the effectiveness of reinforcement from the teaching lecturers, and implementing a supervision system that is more adaptive to the needs of students. This more systematic approach is expected to support students in getting a more comprehensive learning experience to build their teaching skills.

Conclusions and Suggestion

Based on the results and discussion above, it can be concluded that through the microteaching course, each student's teaching skills are increasingly developed, which is shown by the increase in grades from the first practice to the third practice in all classes. The standard deviation analysis shows that the uniformity of students' teaching skills is increasing as the teaching experience practiced increases and the variation in grades between practices decreases. When viewed categorically, students who are included in the good and very good categories dominate as many as 45 students (54.9%), while the remaining 37 students (45.1%) are in the adequate and poor categories. A total of 4 indicators can be mastered very good by students. These indicators are skills in opening learning, skills in using language, skills in appearance, and skills in closing learning.

On the other hand, 10 indicators are in the adequate category and 3 indicators are in the poor category, so they require more in-depth intervention and improvement. Indicators with poor mastery are skills in implementing learning with the TPACK, PBL, PjBL, and independent learning approaches, skills in developing thinking skills and decision making in a learning environment, and skills in applying assessment instruments oriented towards achieving HOTS-based learning objectives. The development of students' teaching skills is supported by four vital principles, namely the principle of practice, the principle of reinforcement, the principle of evaluation, and the principle of precise supervision. These four principles must be considered so that students' teaching skills can be optimized as best as possible. Several efforts can be made to optimize this skill, for example improving self-reflection through practical documentation, providing feedback and guided evaluation from the teaching lecturer, and providing higher quality initial knowledge before taking microteaching learning. The limitations of this study lie in its scope, which only covers microteaching courses, thus not fully representing students' teaching abilities as seen in field practice at school. Furthermore, the analysis of this study is still limited to a description of the results without

revealing the factors causing differences in teaching skills in depth. Nevertheless, this study contributes to enriching the understanding of the teaching skills profile of mathematics education students and the role of microteaching in it, and can serve as a basis for the development of a more effective microteaching curriculum and learning strategies to improve students' teaching readiness in higher education.

References

Adi, A. B. P. K., & Ambarini, R. (2025). Unlocking teaching potential: Dataset on the impact of the STAR technique in junior high microteaching for writing instruction. *Social Sciences & Humanities Open*, *11*, 101372. https://doi.org/10.1016/j.ssaho.2025.101372

Afriannisa, A., Rahma, L. H., Azhirakeisha, S. M., Aisyah, R., & Zulfadewina. (2025). Faktor yang Mempengaruhi Terjadinya Permasalahan Mahasiswa dalam Microteaching. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, *11*(02), 211–229. https://doi.org/10.36989/didaktik.v11i02.5967

Amalia, R., Anugrawati, N., & Baso, F. A. (2024). Investigating the Significance of the Reflection Stage in Microteaching at the Sixth Semester of Student at Universitas Muhammadiyah Makassar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *9*(3), 275–289. https://doi.org/10.23969/jp.v9i3.18590

Arifmiboy. (2019). *Microteaching: Model Tadaluring*. Ponorogo: WADE Group National Publishing.

Arsal, Z. (2014). Microteaching and pre-service teachers' sense of self-efficacy in teaching. *European Journal of Teacher Education*, *37*(4), 453–464. https://doi.org/10.1080/02619768.2014.912627

Arsana, I. K. S. (2020). Pengaruh Keterampilan Mengajar Guru dan Fasilitas Belajar terhadap Motivasi Belajar Siswa. *Sosial Horizon: Jurnal Pendidikan Sosial*, *6*(2), 269–282. https://doi.org/10.31571/sosial.v6i2.1294

Astuti, M., Kanada, R., Suryana, I., Miranti, M., Andini, A., Jannah, M., & Sadina, B. (2024). Microteaching sebagai Pusat Sumber Belajar di Era Digital. *Jurnal Basicedu*, *8*(3), 2430–2437. https://doi.org/10.31004/basicedu.v8i3.7806

Astuti, R., Kamila, N. S., & Mahatama, D. S. (2024). An Analysis Study of the Utilisation of Digital Learning Media in the Implementation of Microteaching Biology. *International Journal of Educational Technology and Society*, *1*(4), 61–71. https://doi.org/10.61132/ijets.v1i4.166

Chera, M. R., Salong, A., & Manuhutu, S. (2022). Analisis Keterampilan Dasar Mengajar Mahasiswa pada Mata Kuliah Micro Teaching: (Studi pada Mahasiswa Angkatan 2018 di Program Studi Pendidikan Ekonomi). *Jurnal Administrasi Terapan*, *1*, 79–86. https://ejournal-polnam.ac.id/index.php/JAT/article/view/1273

Fischetti, J., Ledger, S., Lynch, D., & Donnelly, D. (2022). -Practice before Practicum: Simulation in Initial Teacher Education. *The Teacher Educator*, *57*(2), 155–174. https://doi.org/10.1080/08878730.2021.1973167

Gafar, A., Panigoro, M., Bahsoan, A., Ilato, R., & Hasiru, R. (2023). Pengaruh Pelaksanaan Micro Teaching terhadap Keterampilan Mengajar Mahasiswa pada Program MBKM

Jurusan Pendidikan Ekonomi Angkatan 2019 Fakultas Ekonomi Universitas Negeri Gorontalo. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *6*(10), 7486–7493. https://doi.org/10.54371/jiip.v6i10.2174

Halean, S., Kandowangko, N., & Goni, S. Y. V. I. (2021). Peranan Pendidikan dalam Meningkatkan Sumber Daya Manusia di SMA Negeri 1 Tampan Amma di Talaud. *HOLISTIK, Journal of Social and Culture*, *14*(2), 1–17. https://ejournal.unsrat.ac.id/index.php/holistik/article/view/33774

Hasibuan, R. S., & Wahyudi, S. (2025). Hubungan Hasil Belajar Microteaching dengan Kemampuan Mengajar Mahasiswa PLP Prodi Pendidikan Teknologi Informasi. *Journal of Science and Social Research*, *8*(3), 5266–5274. https://doi.org/10.54314/jssr.v8i3.4262

Hidayat, R., & Abdillah. (2019). *Ilmu Pendidikan: Konsep, Teori dan Aplikasinya*. Medan: Lembaga Peduli Pengembangan Pendidikan Indonesia (LPPPI).

Ikrom, F. D., & Rahayu, M. (2024). Studi Literatur Pembelajaran Micro Teaching terhadap Keterampilan Mengajar Mahasiswa Jurusan PGSD. *Journal of Professional Elementary Education*, *3*(2), 169–178. https://doi.org/10.46306/jpee.v3i2.75

Isnaniah, I., & Imamuddin, M. (2022). Keterampilan Membuka dan Menutup Pelajaran Mahasiswa Calon Guru Matematika pada Matakuliah Microteaching. *JURING (Journal for Research in Mathematics Learning)*, *5*(3), 147–156. https://doi.org/10.24014/juring.v5i3.16870

Merdekawaty, A., Suryani, E., & Nurhairunnisah. (2024). Analisis Kompetensi Pedagogik Mahasiswa Calon Guru dalam Menerapkan Kurikulum Merdeka. *Titian Ilmu: Jurnal Ilmiah Multi Sciences*, *16*(2), 103–109. https://doi.org/10.30599/jti.v16i2.3440

Mustafa, P. S. (2024). *Buku Ajar Profesi Keguruan untuk Mahasiswa Pendidikan dan Keguruan*. Mataram: Pustaka Madani.

Mustiko, A. B., & Trisnawati, N. (2021). Pengaruh Keterampilan Mengajar Guru, Kesiapan Belajar Dan Motivasi Sebagai Variabel Intervening Terhadap Hasil Belajar Siswa. *Journal of Office Administration: Education and Practice*, *1*(1), 42–52. https://doi.org/10.26740/joaep.v1n1.p42-52

Novianti, N., & Khaulah, S. (2022). Analisis Pelaksanaan Pembelajaran Microteaching Mahasiswa Program Studi Pendidikan Matematika Universitas Almuslim. *Asimetris: Jurnal* Pendidikan *Matematika dan Sains*, *3*(1), 30–36. https://doi.org/10.51179/asimetris.v3i1.1277

Nurdian, N., & Suma Setyawati, N. (2025). Implementasi Keterampilan Dasar Mengajar Mahasiswa PGSD dalam Praktik Manajemen Kelas. *Jurnal Studi Pendidikan Anak Usia Dini*, *1*(2), 52–60. https://doi.org/10.58540/jspaud.v1i2.986

Nurmasyitah, N. (2021). Analisis Keterampilan Mengajar Mahasiswa Pendidikan Fisika pada Mata Kuliah Microteaching. *Jurnal Pendidikan Fisika*, *9*(1), 102–113. https://doi.org/10.24127/jpf.v9i1.3527

Nurwahidah, I. (2020). Kemampuan Keterampilan Dasar Mengajar Mahasiswa Calon Guru IPA Program Studi Pendidian IPA. *EduTeach: Jurnal Edukasi dan Teknologi Pembelajaran*, *1*(2), 22–33. https://doi.org/10.37859/eduteach.v1i2.1957

Undang-undang (UU) Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional, Pub. L. No. 20 (2003). https://peraturan.bpk.go.id/Details/43920/uu-no-20-tahun-2003

Undang-undang (UU) Nomor 14 Tahun 2005 tentang Guru dan Dosen, Pub. L. No. 14 (2005). https://peraturan.bpk.go.id/Details/40266/uu-no-14-tahun-2005

Purba, H., Sitepu, A., & Silaban, P. (2020). Pengaruh Keterampilan Mengajar Guru terhadap Motivasi Belajar Siswa Kelas V Mata Pelajaran Matematika. *Jurnal Educatio FKIP UNMA*, *6*(2), 242–247. https://doi.org/10.31949/educatio.v6i2.437

Purwanti, E., & Suhargo, G. I. (2024). Enhancing Pedagogical Competencies in Pre-service Teachers' through Microteaching: A Qualitative Study. *Indonesian Journal of Learning and Instruction*, *7*(1). https://doi.org/10.25134/ijli.v7i1.9553

Putra, M. M., Meldina, T., Oktori, A. R., & Susilawati. (2024). Analisis Keterampilan Mengajar Mahasiswa pada Mata Kuliah Micro Teaching Program Studi Pendidikan Guru Madrasah Ibtidaiyah. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *9*(4), 341–349. https://doi.org/10.23969/jp.v9i04.20111

Rahman, A. (2022). Analisis Pentingnya Pengembangan Kompetensi Guru. *Jurnal Pendidikan Tambusai*, *6*(1), 8455–8466. https://doi.org/10.31004/jptam.v6i1.3726

Ro, E., & Kim, H. (2024). Pre-service teachers' hinting practices in managing responses in a microteaching context. *Linguistics and Education*, *84*, 101345. https://doi.org/10.1016/j.linged.2024.101345

Sudarman, & Elyawati, N. (2021). *Microteaching Dasar Komunikasi dan Keterampilan Mengajar*. Malang: Wineka Media.

Sukirman, D. (2012). *Pembelajaran Micro Teaching*. Jakarta: Direktorat Jenderal Pendidikan Islam Kementerian Agama.

Telaumbanua, A. (2020). Teori Belajar Behavioristik dalam Meningkatkan Kemampuan Merespon Materi Perkuliahan. *DIDAKTIKOS: Jurnal Pendidikan Agama Kristen*, *3*(1), 49–59. https://doi.org/10.32490/didaktik.v3i1.8

Widodo, A. nur A., Ardani, A., & Aristiyo, D. N. (2021). Pengaruh Self Efficacy dan Prestasi Microteaching Berbantu Zoom Meeting terhadap Kemampuan Mengajar Matematika. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *10*(2), 1088–1098. https://doi.org/10.24127/ajpm.v10i2.3643

Windiyani, T., Kurnia, D., & Purnamasari, R. (2020). *Profesi Kependidikan: Kajian Konsep, Aturan dan Fakta Keguruan*. Bogor: Program Studi Pendidikan Guru Sekolah Dasar Universitas Pakuan.