

Professional Teacher Competencies for Learning Quality in Vocational Education

¹Hindun Yafa Chotijah, ²Suparman, ³Dian Artha Kusumaningtyas, ⁴Dwi Sulisworo*

Universitas Ahmad Dahlan, Indonesia.

Email: ¹hindun0709@gmail.com, ²suparman@pmat.uad.ac.id, ³dian.artha@pfis.uad.ac.id, ⁴dwi.sulisworo@uad.ac.id*

* Correspondence author

ARTICLE INFO

Article history

Received Mar 02, 2025

Revised Jun 12, 2025

Accepted Jun 21, 2025

Keywords

Teacher Competence

Vocational School

Learning Quality

Teacher Training

ABSTRACT

Learning Quality requires teachers who are competent in pedagogical, professional, social, and personality aspects. Teachers who have high competence can manage classes effectively, understand student needs, and apply innovative learning methods. Along with curriculum changes and technological developments, improving teacher competence in vocational school is urgent to create a more interactive and meaningful learning process. This study uses a qualitative method with a literature study approach to analyze strategies for improving teacher competence in vocational school. Data was obtained from various academic sources that discussed teacher training, technology utilization, self-evaluation, and the role of the teacher community. This study concludes that improving teacher competence in vocational school is a key factor in realizing effective learning. With the right strategy, it is hoped that the quality of education will increase so as to produce competitive graduates. The study recommends sustainable policies to support teachers' professional development in accordance with current educational needs.

This is an open access article under the [CC-BY-SA](#) license.



Introduction

The competence of professional teachers is the main factor in realizing Learning Quality (Ningsih, 2024). A professional teacher based on Law Number 14 of 2005 concerning Teachers and Lecturers, must have qualified pedagogic, personality, social, and professional skills in order to carry out their duties effectively. Pedagogic competence includes an understanding of student characteristics, systematic learning planning, and the use of methods that suit the needs of students (Sudargini & Purwanto, 2020; Susanto et al., 2020). Meanwhile, professional competence requires a

deep mastery of the fields of science taught, as well as the ability to continue to develop oneself following the development of science and technology (Muhammadiyah et al., 2022).

In addition to pedagogic and professional aspects, a teacher must also have good social competence and personality. Social competence involves the ability to communicate and interact with students, parents, and the community effectively. Teachers who have high social competence can create a conducive learning environment and build harmonious relationships with various parties (Matsumoto-Royo & Ramírez-Montoya, 2021). On the other hand, personality competencies reflect the character of a teacher, such as discipline, integrity, and an attitude that is an example for students. With strong personality competence, a teacher can become a respected and trusted figure in the educational environment (Matsumoto-Royo & Ramírez-Montoya, 2021).

While this national framework provides a solid foundation for understanding teacher competence in Indonesia, it is important to view it in the context of global educational standards and trends. Comparative insights from international teacher competency models can enrich the discourse and help align local strategies with broader, internationally recognized practices.

For example, the OECD Teacher Competency Framework emphasizes continuous professional learning, collaboration, adaptability, and evidence-based practice. The Danielson Framework for Teaching organizes teacher competence into four domains: planning and preparation, the classroom environment, instruction, and professional responsibilities. Meanwhile, the European Commission's Professional Profile for Teachers identifies competences such as working collaboratively, embracing diversity, and engaging in reflective practice. These frameworks highlight that teacher professionalism is not only about knowledge and skills, but also about ethical responsibility, innovation, and adaptability to diverse educational contexts.

Teachers need to continue to develop themselves to improve their professional competence. There are various strategies for this self-development, such as participating in training (Culajara, 2023; Yusuf et al., 2023), conducting classroom action research (Elvina et al., 2022; Semathong, 2023), and utilizing technology in learning (Mansurjonovich, 2022). In addition, reflection on teaching practices is also an important step in improving the effectiveness of learning (Chan & Lee, 2021). By having good competence, a teacher can create quality, innovative learning, and be able to shape character and improve student achievement.

This study aims to explore the role of professional teacher competence in vocational schools as a contributing factor to learning quality. It specifically identifies relevant aspects of competence and analyzes their influence on learning in schools. The benefit of this study is to offer a structured

synthesis of literature based on Indonesia's national framework for teacher competence. This synthesis can support stakeholders in designing more effective education policies to enhance teacher professionalism in vocational education settings.

Method

This study uses a qualitative approach with a library research method to analyze various relevant academic sources regarding the competence of professional teachers in achieving learning quality. Data were obtained from books, peer-reviewed scientific journals, government regulations, and credible research reports that discuss pedagogic, professional, social, and personality competencies of teachers, particularly in vocational education contexts.

The literature search was conducted using the Dimensions AI database with the keyword "vocational teacher competency" applied specifically to the title and abstract fields. The initial search returned 2,074 publications from the years 2011 to 2025. After filtering by subject area (Education, $n = 1,673$) and publication type (Articles and Proceedings, $n = 1,509$), relevant documents were selected for further screening. This database was accessed on June 12, 2025 to ensure the inclusion of the most up-to-date research.

The inclusion criteria consisted of: (1) publication years between 2011 and 2025; (2) relevance to vocational education and teacher competence; (3) publication types limited to articles and conference proceedings; and (4) content addressing one or more of the four national teacher competencies. Studies focused solely on early childhood or higher education were excluded unless comparative insights were applicable.

The data collection process focused on identifying both theoretical and empirical literature that links teacher competence with learning quality. Each source was assessed based on methodological rigor and contextual relevance.

Data analysis employed a descriptive-qualitative content analysis approach. Sources were coded into competency categories and thematically synthesized. Themes, patterns, and gaps were identified to develop a conceptual understanding of vocational teacher competencies and their implications for effective teaching.

Although this study did not apply a full PRISMA protocol, elements such as systematic filtering, inclusion/exclusion criteria, and transparent reporting were adopted to enhance validity. A PRISMA-style flow diagram was constructed to visualize the literature selection process.

Result and Discussion

Professional teachers are understood as teachers who have abilities that are a combination of a deep understanding of the defining aspects of the profession, opportunities to learn in universality-based teacher education, and the ability to face challenges in the teaching profession (Tatto, 2021). Another study explains that professional teachers are teachers who are capable of implementing responsibility-based learning and self-reflection, building positive social relationships, fostering an entrepreneurial spirit and mastering contemporary technology in guiding students to face the challenges of the times (Ayranci & Başkan, 2021). Professional teachers are educators who continue to develop competencies and update themselves in accordance with the demands of the times, uphold professional ethics, obey regulations, have the ability to cooperate with various parties and have a good image in society by showing exemplary attitudes and behaviors both during and outside of carrying out their duties (Jafar et al., 2020). Based on these understandings, it can be understood that professional teachers are educators who have a deep understanding of their profession, continue to develop competencies according to the demands of the times, uphold ethics, and are able to integrate technology and build positive social relationships in guiding students.

Professional teachers have a crucial role in determining the quality of education, so their competence is very important to create effective and meaningful learning. The competencies that need to be possessed by professional teachers are teaching competence, building good relationships, personal integrity, professional mastery and mastery of technology according to the times. These competencies are in line with Law Number 14 of 2005 concerning Teachers and Lecturers. Based on the law, teacher competence in vocational school can be categorized in four main aspects: pedagogic, professional, social, and personality. Various studies explain that these four competencies are the basis for ensuring optimal task implementation and have a positive impact on students that shown on figure 1.

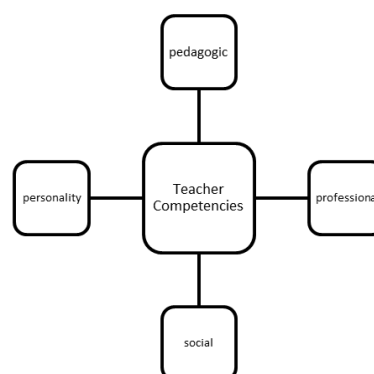


Fig 1: Teacher Competencies

Pedagogic Competencies

This competency is related to the teacher's ability to design, implement, and evaluate learning. Teachers who have pedagogic competence are able to understand the characteristics of students, choose effective learning strategies, and create a fun and interactive learning atmosphere (Hauck et al., 2020; König et al., 2021). Table 1 shows the sources of the pedagogic competencies in each indicator.

Table 1. Pedagogic Competencies

Competency Indicators	Sources
Understanding the Characteristics of Students	(Ayranci & Başkan, 2021; Graham et al., 2021; Hassan et al., 2021)(Ayu Sri Wahyuni, 2022; Baskara & Sutarni, 2024)(Gamage et al., 2021)
Selection of Effective Learning Strategies	(Lonita & Simatupang, 2020)(Kang & Kim, 2021)
Creating a Fun and Interactive Learning Atmosphere	(Widiyaningsih & Narimo, 2023)(Liaw et al., 2023; Troussas et al., 2023)

1. Understanding the Characteristics of Students

Teachers who have pedagogic competence are required to understand the characteristics of students in depth, both in terms of cognitive, emotional, social, and cultural. This understanding is important because each student has different learning styles, interests, and needs in the learning process (Ayranci & Başkan, 2021; Graham et al., 2021; Hassan et al., 2021). Studies in Indonesia show that when teachers are able to identify individual differences in students, teachers can provide a more personalized and inclusive approach to learning (Ayu Sri Wahyuni, 2022; Baskara & Sutarni, 2024). Meanwhile, international research confirms that understanding students' character contributes to increased learning motivation and better academic outcomes (Gamage et al., 2021).

2. Selection of Effective Learning Strategies

In addition to understanding students, competent teachers are also able to choose learning strategies that suit their needs. In the context of education in Indonesia, approaches such as Problem-Based Learning and scientific approaches have been applied to improve students' critical thinking skills (Lonita & Simatupang, 2020). At the international level, methods such as flipped classroom and blended learning are increasingly popular because they provide flexibility in the learning process and improve interaction between teachers and students (Kang & Kim, 2021). The proper application of various strategies can help students understand the material better and

encourage active participation in learning.

3. Creating a Fun and Interactive Learning Atmosphere

Pedagogic competencies also include teachers' ability to create a conducive, fun, and interactive learning environment. Studies in Indonesia show that a positive and enthusiastic classroom atmosphere increases student engagement and motivation in learning (Widiyaningsih & Narimo, 2023). At the global level, research highlights the importance of good interaction between teachers and students in building an inclusive and supportive learning environment. By adopting engaging methods, such as educational games, group discussions, or the use of technology in learning, teachers can create a more enjoyable and effective learning experience for learners (Liaw et al., 2023; Troussas et al., 2023).

Professional Competencies

Deep mastery of subject matter is the main competency of a teacher. Mastery of subject matter is increasingly useful by always *up-to-date* with knowledge and the development of the times. Table 2 shows the sources of the professional competencies in each indicator.

Table 2. Professional Competencies

Competency Indicators	Sources
Mastery of Materials as the Foundation of Teacher Professionalism	(Istiqomah et al., 2022)(Shen et al., 2020)
Knowledge Renewal in Educational Dynamics	(Karina et al., 2024)(Jafar et al., 2020)
Relevance of Learning Materials to Student Needs	(Hidayati et al., 2024)(Goldman et al., 2020)

1. Mastery of Materials as the Foundation of Teacher Professionalism

In-depth mastery of subject matter is a fundamental aspect of a teacher's professionalism. An educator must have a conceptual and applicative understanding of the material being taught in order to convey information clearly and systematically to students. According to education studies in Indonesia, teachers who have a good grasp of academic substance tend to be more effective in explaining complex concepts and connecting material with real-life contexts (Istiqomah et al., 2022). Meanwhile, international research shows that teachers' academic competence has a positive correlation with student achievement, as deep understanding allows teachers to provide relevant examples as well as devise learning strategies that are appropriate to students' level of understanding (Shen et al., 2020).

2. Knowledge Renewal in Educational Dynamics

In a world that continues to develop, teachers are required to always update their knowledge to remain relevant to the development of science and technology. In Indonesia, the implementation that is developing always emphasizes the importance of flexibility in teaching, teachers must be able to adapt learning materials to the development of knowledge and the needs of students (Karina et al., 2024). Globally, technology-based education approaches, such as AI-Assisted Learning and STEM (Science, Technology, Engineering, and Mathematics) integration, further emphasize the need for teachers to continue to develop competencies. Various studies show that continuous professional training for teachers can improve the quality of teaching and adapt to dynamic curriculum changes and educational technology (Jafar et al., 2020).

3. Relevance of Learning Materials to Student Needs

In order for learning to be more meaningful, teachers must ensure that the information conveyed is relevant to the development of the times and the needs of students. In the context of education in Indonesia, the relevance of materials is often associated with 21st century skills, such as problem-solving, critical thinking, and digital literacy (Hidayati et al., 2024). International research also shows that contextual-based learning, such as Project-Based Learning (PBL) or Experiential Learning approaches, can increase student engagement in the learning process (Goldman et al., 2020). Aligning subject matter with the needs of the world of work and global developments, requires the ability of teachers to be able to play a role not only as teachers, but also as facilitators who equip students with the skills needed in the future.

Social Competencies

Teachers not only play the role of educators, but also as guides who must be able to communicate well, both to students, parents, and the community. Social competence helps teachers in creating a conducive learning environment and building harmonious relationships with various parties. Table 3 shows the sources of the social competencies in each indicator.

Table 3. Social Competencies

Competency Indicators	Sources
The Role of Teachers as Educators and Supervisors	(Ambarawati, 2021)(Byrd & Alexander, 2020)
Building Relationships with Parents and the Community	(Triwardhani et al., 2020)(Goodall, 2021)
Creating a Conducive Learning Environment	(Karina et al., 2024; Mahsus & Latipah, 2021)(Šebart et al., 2021)

1. The Role of Teachers as Educators and Supervisors

Teachers not only play a role in transferring knowledge, but also as guides who shape the character and personality of students. Good communication skills allow teachers to build positive relationships with students, thus creating a comfortable and enjoyable learning atmosphere. Studies in Indonesia show that teachers who have good communication skills can increase student engagement in learning as well as build stronger trust in the classroom (Ambarawati, 2021). Meanwhile, international research emphasizes that effective communication between teachers and students contributes to increased learning motivation, confidence, and academic achievement (Byrd & Alexander, 2020).

2. Building Relationships with Parents and the Community

In addition to interacting with students, teachers must also be able to establish good communication with parents and the community. A harmonious relationship with parents allows teachers to understand more deeply the development and needs of students outside of the school environment. In Indonesia, school programs involving parents, such as regular meetings and communication through digital media, have proven to be effective in increasing collaboration between schools and families (Triwardhani et al., 2020). At the global level, the concept of "parental engagement" is increasingly emphasized in modern education systems, where parental involvement in the child's education process can improve learning outcomes and overall student well-being (Goodall, 2021).

3. Creating a Conducive Learning Environment

Teachers' social competence also plays a role in creating a conducive and inclusive learning environment. Teachers who have good interpersonal skills can build a positive classroom atmosphere, where students feel valued and supported in the learning process. In Indonesia, the implementation of collaborative learning strategies and empathy-based approaches has shown positive results in increasing healthy interactions in the classroom (Karina et al., 2024; Mahsus & Latipah, 2021). Meanwhile, international research highlights the importance of diversity in teacher communication to ensure that every student, regardless of social or cultural background, gets equal opportunities in learning (Šebart et al., 2021). These studies show that teachers' social skills are one of the key factors in creating effective and meaningful learning experiences.

Personality Competencies

The character of a teacher will greatly affect the success of learning. Teachers who have good personality competencies will be role models for their students. Discipline, responsibility, honesty,

and authority are some examples of personality competencies that must be possessed by a professional teacher. Table 4 shows the sources of the personality competencies in each indicator.

Table 4. Personality Competencies

Competency Indicators	Sources
The Influence of Teacher Character on Learning Success	(Ermansyah & Mantau, 2021)(Dhillon & Kaur, 2023)
Teachers as Role Models for Students	(Ermansyah & Mantau, 2021)(Dhillon & Kaur, 2023)
Personality Aspects in Teacher Professionalism	(Blegur et al., 2023; Carmen et al., 2022)

1. The Influence of Teacher Character on Learning Success

A teacher's personality plays a big role in determining the success of learning in the classroom. Teachers who have strong character are able to create a positive learning environment that has an impact on students feeling comfortable and motivated to learn. In various studies in Indonesia, it was found that teachers' personality competencies have a very significant influence on the character of students (Ermansyah & Mantau, 2021). International studies have also revealed that teachers' personalities, including empathy and assertiveness, have a direct impact on students' emotional and academic well-being (Dhillon & Kaur, 2023).

2. Teachers as Role Models for Students

As a figure who interacts directly with students every day, teachers have an important role in shaping the character of students. The teacher's disciplined, patient, and responsible personality will be an example for students in building positive habits. In Indonesia, many schools implement character education that emphasizes the importance of exemplary teachers as part of the learning process (Ermansyah & Mantau, 2021). Meanwhile, global research confirms that teachers who show an attitude of integrity and honesty can build trust between themselves and students, thereby creating a more open and harmonious learning environment (Dhillon & Kaur, 2023).

3. Personality Aspects in Teacher Professionalism

A professional teacher is not only required to have academic competence, but also an authoritative and inspiring personality. An authoritative attitude does not mean authoritarian, but it reflects confidence and the ability to manage the classroom well. In various world education systems, teachers who have a balance between assertiveness and empathy are considered more effective in managing classroom dynamics and guiding students to reach their maximum potential (Blegur et al., 2023; Carmen et al., 2022). This aspect of personality needs to be continuously

improved through continuous training and self-reflection so that the teacher's personality remains in line with educational values that are oriented towards the formation of student character.

Teacher competence in vocational school is a key factor in realizing Learning Quality because it determines the effectiveness of the teaching process and student learning outcomes. Teachers with good pedagogic competence are able to design learning strategies that suit the needs of students, create a conducive classroom atmosphere, and adapt teaching methods to students' learning styles (Ayranci & Başkan, 2021; Šebart et al., 2021). Mastery of professional competence allows teachers to understand the material in depth and connect it with the latest scientific and technological developments. The role of teachers is not only as a facilitator of learning, but also as an agent of change that forms a critical and creative mindset in students.

The demands on teachers are increasing along with curriculum changes and technological advances. Mastery of educational technology is an important aspect in increasing the effectiveness of teaching because it allows the presentation of material in a more interactive and interesting way. The ability to reflect and evaluate teaching practices contributes to improving the quality of learning. Continuous competency development allows teachers to create an inspiring learning environment, support the development of students' character, and prepare them to face global challenges. Investment in improving teacher competence in vocational school must be a priority in an effort to improve the quality of education in a sustainable manner.

However, implementing teacher training as a strategy for professional development faces several limitations. These include financial constraints, time availability, and unequal access—particularly in remote or under-resourced areas. Not all schools have the same opportunities to send teachers for training, which leads to gaps in competency development across regions.

In addition, there is often tension between the different competency demands placed on teachers. For instance, the requirement to comply with administrative reporting and documentation may conflict with the time and autonomy needed to engage in pedagogical innovation. These competing demands can hinder the realization of ideal teaching practices.

Systemic challenges such as high teacher workload, differences in school facilities and infrastructure, and limited institutional support further complicate efforts to improve competence. Teachers in vocational schools often face additional responsibilities related to industry partnerships or practical workshops, which add to their daily burden without adequate compensation or structural support.

Conclusion

Based on the above study, it can be concluded that teachers' competence in pedagogic, professional, social, and personality aspects plays an important role in creating quality and adaptive learning that aligns with curriculum changes and technological developments. Improving teacher competency can be achieved through continuous training, the use of technology in learning, self-evaluation, and participation in the teacher community. The combination of various strategies to enhance teacher competence in vocational schools has been proven to increase teaching effectiveness, student learning motivation, and innovation in learning methods.

As for suggestions, further research can explore the effectiveness of each teacher competency improvement strategy through quantitative methods or case studies at various levels of education. Additionally, an in-depth study is needed to analyze the long-term impact of teacher competency development on student learning outcomes. It is also necessary to further examine the implementation of policies aimed at improving teacher competence in vocational schools across various regions, particularly in relation to obstacles and solutions in its implementation.

References

- Ambarawati, A. (2021). Urgensi Keterampilan Komunikasi Nonverbal Guru Pada Era Society 5.0. *Jurnal Darussalam: Jurnal Pendidikan, Komunikasi Dan Pemikiran Hukum Islam*, 12(2), 64–81. <https://doi.org/10.30739/darussalam.v12i2.1188>
- Ayranci, B. B., & Başkan, A. (2021). "Competence Areas" as a New Notion Instead of Teacher Competencies. *Education Quarterly Reviews*, 4(2), 1–14. <https://doi.org/10.31014/aior.1993.04.02.221>
- Ayu Sri Wahyuni. (2022). Literature Review: Pendekatan Berdiferensiasi Dalam Pembelajaran IPA. *Jurnal Pendidikan Mipa*, 12(2), 118–126. <https://doi.org/10.37630/jpm.v12i2.562>
- Baskara, A., & Sutarni, N. (2024). Kompetensi pedagogik guru sma di indonesia: sebuah systematic literature review. *Didaktika: Jurnal Kependidikan*, 13(3), 3481–3496.
- Blegur, J., Haq, A. H. B., & Barida, M. (2023). Assertiveness as a New Strategy for Physical Education Students to Maintain Academic Performance. *Qualitative Report*, 28(3). <https://doi.org/10.46743/2160-3715/2023.5659>
- Byrd, D. R., & Alexander, M. (2020). Investigating special education teachers' knowledge and skills: Preparing general teacher preparation for professional development. *Journal of Pedagogical*

Research.

- Carmen, R. G., Olga, B. G., & Beatriz, M. (2022). Socio-Emotional Competence and Self-Efficacy of Future Secondary School Teachers. *Education Sciences*, 12(3). <https://doi.org/10.3390/educsci12030161>
- Chan, C. K. Y., & Lee, K. K. W. (2021). Reflection literacy: A multilevel perspective on the challenges of using reflections in higher education through a comprehensive literature review. *Educational Research Review*, 32(October 2020), 100376. <https://doi.org/10.1016/j.edurev.2020.100376>
- Culajara, C. J. (2023). Improving teachers' professional development through School Learning Action Cell (SLAC). *Journal of Research, Policy & Practice of Teachers & Teacher Education*, 13(1), 76–88. <https://doi.org/10.37134/jrpptte.vol13.1.6.2023>
- Dhillon, N., & Kaur, G. (2023). Impact of Personality Traits on Communication Effectiveness of Teachers: Exploring the Mediating Role of Their Communication Style. *SAGE Open*, 13(2), 1–15. <https://doi.org/10.1177/21582440231168049>
- Elvina, D., Wakhinuddin, W., Edidas, E., & Ambiyar, A. (2022). Evaluation of teacher performance in post-certification classroom action research at the vocational school. *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia*, 8(2), 147. <https://doi.org/10.29210/1202322576>
- Ermansyah, R., & Mantau, B. A. K. (2021). Pengaruh Kompetensi Pedagogik Terhadap Minat Belajar Siswa. *Tadbir: Jurnal Manajemen Pendidikan Islam*, 9(2), 202–221.
- Gamage, K. A. A., Dehideniya, D. M. S. C. P. K., & Ekanayake, S. Y. (2021). The role of personal values in learning approaches and student achievements. *Behavioral Sciences*, 11(7). <https://doi.org/10.3390/bs11070102>
- Goldman, J., Kuper, A., Ross Baker, G., Bulmer, B., Coffey, M., Jeffs, L., Shea, C., Whitehead, C., Shojania, K. G., & Wong, B. (2020). Experiential Learning in Project-Based Quality Improvement Education: Questioning Assumptions and Identifying Future Directions. *Academic Medicine*, 95(11), 1745–1754. <https://doi.org/10.1097/ACM.00000000000003203>
- Goodall, J. (2021). Parental engagement and deficit discourses: absolving the system and solving parents. *Educational Review*, 73(1), 98–110. <https://doi.org/10.1080/00131911.2018.1559801>
- Graham, L. J., de Bruin, K., Lassig, C., & Spandagou, I. (2021). A scoping review of 20 years of research on differentiation: investigating conceptualisation, characteristics, and methods used. *Review of Education*, 9(1), 161–198. <https://doi.org/10.1002/rev3.3238>
- Hassan, M. A., Habiba, U., Majeed, F., & Shoaib, M. (2021). Adaptive gamification in e-learning based Professional Teacher Competencies for Learn... (Chotijah H. Y., et al.)

- on students' learning styles. *Interactive Learning Environments*, 29(4), 545–565. <https://doi.org/10.1080/10494820.2019.1588745>
- Hauck, M., Müller-Hartmann, A., Rienties, B., & Rogaten, J. (2020). Approaches to researching digital-pedagogical competence development in VE-based teacher education. *Journal of Virtual Exchange*, 3(SI), 5–35. <https://doi.org/10.21827/jve.3.36082>
- Hidayati, N., Farida Nugrahani, & Suwanto. (2024). Pengaruh Kemampuan Berpikir Kritis dan Minat Baca Terhadap Kemampuan Literasi Digital . *Didaktika: Jurnal Kependidikan*, 13(3 SE-Articles), 3201–3212.
- Istiqomah, A., Angin, L. M. P., Iyolanda, S., & Guru, K. (2022). Analisis Kompetensi Guru dalam Menunjang Keberhasilan dalam Proses Belajar Mengajar di SMP N 39 Medan. *Jurnal Pendidikan Indonesia*, 3(4), 417–429.
- Jafar, D. S. A., Saud, M. S., Hamid, M. Z. A., Suhairom, N., Hisham, M. H. M., & Zaid, Y. H. (2020). TVET teacher professional competency framework in industry 4.0 era. *Universal Journal of Educational Research*, 8(5), 1969–1979. <https://doi.org/10.13189/ujer.2020.080534>
- Kang, H. Y., & Kim, H. R. (2021). Impact of blended learning on learning outcomes in the public healthcare education course: a review of flipped classroom with team-based learning. *BMC Medical Education*, 21(1), 1–8. <https://doi.org/10.1186/s12909-021-02508-y>
- Karina, M., Judijanto, L., Rukmini, A., Fauzi, M. S., Arsyad, M., Pgri, U. I., Jakarta, I., Nida, S., Adabi, E., & Oleo, U. H. (2024). Pengaruh Interaksi Sosial Terhadap Prestasi Akademik : Tinjauan Literatur Pada Pembelajaran Kolaboratif. 4.
- König, J., Blömeke, S., Jentsch, A., Schlesinger, L., née Nehls, C. F., Musekamp, F., & Kaiser, G. (2021). The links between pedagogical competence, instructional quality, and mathematics achievement in the lower secondary classroom. *Educational Studies in Mathematics*, 107(1), 189–212. <https://doi.org/10.1007/s10649-020-10021-0>
- Liaw, S. Y., Tan, J. Z., Lim, S., Zhou, W., Yap, J., Ratan, R., Ooi, S. L., Wong, S. J., Seah, B., & Chua, W. L. (2023). Artificial intelligence in virtual reality simulation for interprofessional communication training: Mixed method study. *Nurse Education Today*, 122(December 2022), 105718. <https://doi.org/10.1016/j.nedt.2023.105718>
- Lonita, F., & Simatupang, H. (2020). Pengaruh Model Problem Based Learning Terhadap Kemampuan Pemecahan Masalah Materi Pencemaran Lingkungan Siswa Sma Negeri 13 Medan. *Jurnal Biolokus*, 3(1), 245–251.

- Mahsus, M., & Latipah, E. (2021). Metodologi Eduinnova: Pembelajaran kolaboratif yang diintegrasikan dengan teknologi untuk meningkatkan keaktifan dan interaksi siswa dalam pembelajaran daring. *Jurnal Inovasi Teknologi Pendidikan*, 8(1), 1–8. <https://doi.org/10.21831/jitp.v8i2.38706>
- Mansurjonovich, J. M. (2022). Professional Educational Institutions Theoretical and Practical Basis of Development of the Content of Pedagogical Activity of Teachers of “Information and Information Technologies.” *Novateur Publications International Journal of Innovations in Engineering Research and Technology*, 9, 2394–3696.
- Matsumoto-Royo, K., & Ramírez-Montoya, M. S. (2021). Core practices in practice-based teacher education: A systematic literature review of its teaching and assessment process. *Studies in Educational Evaluation*, 70, 101047. <https://doi.org/10.1016/j.stueduc.2021.101047>
- Muhammadiyah, M., Hamsiah, A., Muzakki, A., Nuramila, N., & Fauzi, Z. A. (2022). The Role of the Professional Teacher as the Agent of Change for Students. *AL-ISHLAH: Jurnal Pendidikan*, 14(4), 6887–6896. <https://doi.org/10.35445/alishlah.v14i4.1372>
- Ningsih, S. A. (2024). Pentingnya Profesionalisme Guru dalam Meningkatkan Kualitas Pendidikan. *Jurnal Pendidikan Dan Ilmu Sosial (Jupendis)*, 2(3), 288–293. <https://doi.org/10.54066/jupendis.v2i3.2056>
- Šebart, M. K., Štefanc, D., & Vidmar, T. (2021). Compulsory education reform between the profession and policy in the light of justice and equal opportunities. *Center for Educational Policy Studies Journal*, 11(2), 185–209. <https://doi.org/10.26529/cepsj.1026>
- Semathong, S. (2023). Participatory Action Research to Develop the Teachers on Classroom Action Research. *Shanlax International Journal of Education*, 11(3), 29–36. <https://doi.org/10.34293/education.v11i3.6118>
- Shen, J., Wu, H., Reeves, P., Zheng, Y., Ryan, L., & ... (2020). The association between teacher leadership and student achievement: A meta-analysis. In *Educational research Elsevier*.
- Sudargini, Y., & Purwanto, A. (2020). the Effect of Teachers Pedagogic Competency on the Learning Outcomes of Students. *Journal of Industrial Engineering & Management Research (Jiemar)*, 1(4), 2722–8878. <https://doi.org/10.7777/jiemar>
- Susanto, R., Rachmadtullah, R., & Rachbini, W. (2020). Technological and Pedagogical Models: Analysis of Factors and Measurement of Learning Outcomes in Education. *Journal of Ethnic and Cultural Studies*, 1–14. <https://doi.org/10.29333/ejecs/311>

- Tatto, M. T. (2021). Professionalism in teaching and the role of teacher education. *European Journal of Teacher Education*, 44(1), 20–44. <https://doi.org/10.1080/02619768.2020.1849130>
- Triwardhani, I. J., Trigartanti, W., Rachmawati, I., & Putra, R. P. (2020). Strategi Guru dalam membangun komunikasi dengan Orang Tua Siswa di Sekolah. *Jurnal Kajian Komunikasi*, 8(1), 99. <https://doi.org/10.24198/jkk.v8i1.23620>
- Troussas, C., Giannakas, F., Sgouropoulou, C., & Voyiatzis, I. (2023). Collaborative activities recommendation based on students' collaborative learning styles using ANN and WSM. *Interactive Learning Environments*, 31(1), 54–67. <https://doi.org/10.1080/10494820.2020.1761835>
- Widiyaningsih, P., & Narimo, S. (2023). Peran Guru dalam Memaksimalkan Semangat Belajar Peserta Didik pada Implementasi Program Kurikulum Merdeka di SMK Negeri 1 Boyolali. *JIIIP - Jurnal Ilmiah Ilmu Pendidikan*, 6(8), 6325–6332. <https://doi.org/10.54371/jiip.v6i8.2753>
- Yusuf, F. M., Mardin, H., & Latjompoh, M. (2023). Training and Assistance in Publication of Scientific Articles of Research Results for Improving Teacher Professional Competence in Boalemo Regency. *Mattawang: Jurnal Pengabdian Masyarakat*, 4(3), 258–262. <https://doi.org/10.35877/454ri.mattawang1917>