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Analysis of Teacher's Role in Mentoring OSN Elementary School Participants in Tawangharjo Sub-district

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Abstract: This study aims to analyze the role of teachers in mentoring National Science Olympiad (OSN) elementary school participants in Tawangharjo sub-district. This study used a qualitative approach with a narrative method. Data were collected through in-depth interviews with mentor teachers and OSN participants, observation, and document analysis. The results showed that teachers act as mentors, motivators, and facilitators in preparing OSN participants. Teachers guide students in understanding complex Olympic materials, develop critical and creative thinking skills, and train them in solving non-routine problems. Teachers also act as motivators by providing moral support, appreciation, and positive feedback to students. In addition, teachers also act as facilitators by providing learning resources, facilitating discussion and collaboration, and utilizing technology in learning. However, there are several obstacles faced by teachers, such as limited time, resources and supporting facilities. Efforts to improve the effectiveness of mentoring have been made through teacher training, increasing the availability of resources, and strengthening collaboration between teachers, parents and schools.

Keywords: *mentoring, teachers, OSN, elementary school, science*

1. Introduction

The Elementary National Science Olympiad (OSN), now known as the National Science Competition (KSN), has been an integral part of the Indonesian educational landscape since 2003. Wismar et al., (2023) This annual event is designed to identify, encourage, and develop young talents in the field of science, particularly at the elementary school (SD) and madrasah ibtidaiyah (MI) levels. (Shamilah, 2020). OSN SD not only functions as a competition, but also as a forum to foster a healthy spirit of competition, encourage creativity, and strengthen understanding of science among students. OSN SD is also a stepping stone for students to participate in international science competitions such as the International Mathematics and Science Olympiad (IMSO) for Primary School (Wahyu Iskandar et al., 2023).

The role of teachers in guiding and preparing students for OSN SD is vital. Teachers not only act as teachers, but also as mentors, motivators, and facilitators who play an important role in identifying students' potential, developing effective learning strategies, and providing moral and academic support (Abidin et al., 2023). Previous studies have shown that mentor teacher quality, including pedagogical competence and experience in mentoring Olympiads, has a positive correlation with student achievement in OSN.

Kecamatan Tawangharjo, Grobogan District, has shown promising potential in producing talented students in science. The active participation of elementary schools in this sub-district in OSN SD is clear evidence of this potential. However, behind this potential, there are problems that need to be studied more deeply. One of them is the lack of teachers' understanding of the materials and characteristics of OSN questions. OSN elementary school questions, especially in Mathematics and Science, are often non-routine and require analytical skills and in-depth concept understanding (Patmala et al., 2023). This is a challenge for teachers in guiding students, especially if teachers do not have adequate experience and training (Suherman et al., 2020).

In addition, limited resources and supporting facilities, such as teaching aids and laboratories, can also be an obstacle in preparing students for OSN SD (Anggraini, 2021). Another challenge that teachers may face is the lack of time to conduct intensive coaching, especially if the teacher doubles as a homeroom teacher with busy teaching responsibilities.

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This study seeks to fill the existing research gap by focusing on the role of teachers in mentoring OSN SD students in Tawangharjo sub-district. This research aims to holistically understand how teachers in this sub-district identify students' potential, design coaching programs, implement learning strategies, and overcome the challenges they face. It will also explore how teacher motivation affects students' OSN achievement. Using a qualitative approach and narrative method, this research will explore teachers' experiences and perspectives in depth, thus providing a richer and more comprehensive picture of their role in preparing students for OSN SD.

This research has novelty value because it is the first study that specifically examines the role of teachers in mentoring OSN elementary school students in Tawangharjo sub-district. This study also uses a qualitative approach with a narrative method, which allows researchers to holistically understand the role of teachers in the specific context of Tawangharjo sub-district. Thus, this research is expected to make a significant contribution to the development of the practice of mentoring OSN SD learners in Tawangharjo sub-district and other areas with similar contexts (Asnawi et al., 2021).

The results of this study are expected to provide useful recommendations for education stakeholders, including teachers, principals and policy makers, in an effort to improve the effectiveness of mentoring OSN SD students. By identifying best practices, challenges, and supporting and inhibiting factors, it is hoped that this research can serve as a foundation for the development of more effective and sustainable coaching programs, thereby improving the quality of science education in Indonesia.

2. Methodology

This research will use a qualitative approach with a narrative method to deeply understand the role of teachers in mentoring OSN elementary school participants in Tawangharjo sub-district (Shamilah, 2020). The qualitative approach was chosen because this research aims to explore a deep understanding of teachers' experiences, perspectives, and practices in mentoring students. The narrative method allows researchers to capture the richness of teachers' stories and experiences, so as to provide a comprehensive picture of their role in preparing students for the OSN SD.

The research design used was an instrumental case study. The case study was chosen because this research focuses on a specific context, namely mentoring OSN elementary school participants in Tawangharjo sub-district. With a case study, researchers can explore in depth how the role of the teacher is realized in this context. Instrumental means that this case is used to understand a broader issue, namely the role of teachers in improving student achievement in science (Stake, 1995). This instrumental case study also allows researchers to dig deeper into how the role of teachers can influence student motivation and learning outcomes in the context of OSN SD.

This research will be conducted in Kecamatan Tawangharjo, Kabupaten Grobogan. The selection of this location is based on the potential of this sub-district in producing outstanding students in the field of science, which can be seen from the active participation of elementary schools in this sub-district in sending their students to the OSN SD event. This location was also chosen because no research has specifically discussed the role of teachers in mentoring OSN SD in Tawangharjo sub-district, so this research can make a new contribution to the development of educational practices in the area.

The participants in this study were elementary school OSN mentor teachers in Tawangharjo sub-district who have had experience mentoring students to participate in the elementary school OSN for at least the last two years (Wahyu Iskandar et al., 2023). This experience criterion was chosen to ensure that participants have a fairly in-depth understanding of the OSN SD mentoring process. The selection of participants will be carried out using *purposive sampling* technique. Another criterion that will be used in the selection of participants is the willingness of teachers to share their experiences and views openly. The number of participants to be involved in this study is 5-7 teachers, which is considered sufficient to provide a representative picture of the role of teachers in this context.

Data in this study will be collected through three main techniques, namely:

1. **In-depth Interviews**: In-depth interviews will be conducted with the primary school OSN mentor teachers. The interview questions will focus on their experiences in mentoring students, strategies and methods used, challenges faced, as well as factors they perceive as contributing to student success. These interviews will be recorded and transcribed for further analysis. In addition, the interviews will also explore information on teachers' motivation in mentoring students, as well as how they build relationships with students and parents to support the learning process (Abidin et al., 2023).
2. **Participant Observation**: Participant observation will be carried out to directly observe the mentoring and learning process carried out by teachers (Sinurat et al., 2021). Researchers will be involved in OSN SD extracurricular activities, such as training, discussions, and competition simulations, to gain a deeper understanding of the teacher's role. These observations will record interactions between teachers and students, the use of learning media, and the overall classroom atmosphere.
3. **Document Analysis**: Document analysis will be conducted on documents related to OSN SD, such as syllabus, practice questions, and student evaluation results. This analysis will provide additional information on learning materials, question difficulty levels, and student progress. These documents can also provide insight into how teachers design and implement the OSN SD coaching program.

Data analysis will be carried out using the interactive model of Miles, Huberman, and Saldana (Shamilah, 2020). The stages of analysis include:

1. **Data Reduction**: Data obtained from interviews, observations, and document analysis will be reduced by organizing, selecting, and summarizing information relevant to the research focus. At this stage, researchers will identify patterns, themes, and categories that emerge from the data.
2. **Data Presentation**: The reduced data will be presented in the form of narratives, matrices, or charts, making it easier for researchers to see patterns, relationships, and emerging themes. The presentation of this data will help researchers to understand more clearly the role of teachers in assisting OSN SD.
3. **Drawing Conclusions**: Based on the presentation of data, researchers will draw conclusions about the role of teachers in mentoring OSN primary school students in Tawangharjo sub-district. These conclusions will be verified by comparing them with existing theories and data from other sources (*triangulation*). This triangulation process will strengthen the validity of the research findings.

To ensure data validity, researchers will use source triangulation and technique triangulation. Source triangulation is done by comparing data from various sources, such as interviews with teachers, observation, and document analysis. Technique triangulation is done by using various data collection techniques, such as interviews, observations, and document analysis. In addition, researchers will also conduct a *member check*, which is asking participants to verify the results of data analysis.

This research will be conducted by paying attention to research ethics, including obtaining permission from the school and informants, maintaining the confidentiality of informants' identities, and ensuring that this research does not harm any party (Patmala et al., 2023). Participants will be given a full explanation of the purpose of the study, data collection procedures, and their right to withdraw from the study at any time.

By using comprehensive research methods and paying attention to research ethics, it is hoped that this study can make a meaningful contribution to our understanding of the role of teachers in mentoring OSN elementary school participants in Tawangharjo sub-district.

3. Results

Teachers have a central role in fostering and preparing students for the OSN competition in Tawangharjo sub-district. This role is not only limited to transferring knowledge about Olympic material which is often complex and requires in-depth understanding of concepts, but also extends to guiding students in developing critical, logical, and creative thinking skills (Sarkity et al., 2020). OSN SD questions, especially in Mathematics and Science, are often non-routine, demanding a high level of analysis, problem solving, and creativity. Therefore, teachers need to equip themselves with strong pedagogical competencies, a deep understanding of the curriculum, and experience in guiding science olympiads (Suherman et al., 2020). In addition, the ability to design and implement innovative and adaptive learning strategies is needed (Gustini & Nurjanah, 2024).

The process of identifying and selecting potential students is a crucial first step in the development of OSN SD. Teachers in Tawangharjo sub-district use various approaches to recognize hidden talents among their students. Observation of students' performance in class, assessment of assignments and daily tests, and the implementation of special tests designed to measure students' abilities in science are some of the commonly used methods (Komang Wiratama et al., 2022). In addition, teachers also actively collaborate with homeroom teachers and other subject teachers to gather more information about students' abilities and interests in science (Nuralan et al., 2022). This comprehensive information becomes the basis for teachers in determining students who will participate in the OSN SD coaching program.

A structured and systematic coaching program is the key to student success in OSN SD. Teachers in Tawangharjo sub-district designed this program carefully, paying attention to learning materials in accordance with the OSN syllabus, intensive and varied problem exercises, realistic competition simulations, and the development of effective problem-solving strategies (Dinita & Imran, 2024). The program focuses not only on mastering the material, but also on developing higher-order thinking skills, such as analysis, synthesis, and evaluation. Teachers also pay special attention to developing students' ability to manage time, deal with pressure, and work together in teams.

In addition to cognitive aspects, teachers in Tawangharjo Sub-district also pay close attention to the motivational aspects of students in the coaching process. Motivation is a key factor that encourages students to learn and achieve (Abidin et al., 2023). Teachers who have high motivation will become role models for students and be able to create a positive and conducive learning atmosphere. The spirit, enthusiasm, and dedication of teachers in guiding students can be contagious and arouse students' fighting spirit to achieve the best achievements (Nurfadila et al., 2022). In addition, teachers also act as motivators by providing moral support, appreciation for students' efforts and progress, and constructive feedback to help students improve their weaknesses.

The motivational approaches used by teachers also vary. Some teachers use an intrinsic motivation approach, which emphasizes the pleasure and satisfaction that students can get from learning and achieving. Another approach used is extrinsic motivation, namely by giving awards or prizes to students who excel. However, the most important thing is that teachers are able to create a learning environment that supports and motivates students to learn independently and continue to develop (Abidin et al., 2023).

Figure 1 Interview with Erin Dwi Susanti

In the interview session, Mrs. Erin Dwi Susanti explained that her main role as a mentor teacher is to provide intensive guidance to students preparing for the OSN. She develops a structured and systematic training program, which includes additional learning materials relevant to the OSN standards as well as varied and challenging practice questions. The learning materials cover a range of important topics tested in the OSN, and are organized with varying levels of difficulty, from basic to advanced.

Ms. Erin also emphasizes the importance of using technology in learning. She utilizes online learning applications and educational videos to help students understand complex material. This approach allows students to learn interactively and access a variety of additional learning resources that help them understand the material better.

In the interview, Ms. Erin also revealed some of the challenges faced in the coaching process, including limited time and resources. However, with the full support of the school, she was able to overcome these obstacles and continue to provide the best guidance to students. Periodic evaluations are conducted to monitor students' progress, and feedback is given constructively to help students improve their performance.

Through this interview, it can be concluded that the dedication and strategies implemented by Mrs. Erin Dwi Susanti in guiding students greatly contribute to students' readiness for the OSN. A structured approach, use of technology, and personalized attention are the keys to success in coaching students preparing for this prestigious competition. Ongoing support from the school also plays an important role in creating a conducive learning environment for the students.

Figure 2 Document Checklist Check with Zulaikha Hermi Pratiwi

In this photo, Mrs. Zulaikha Hermi Pratiwi is seen checking the document checklist. Mrs. Zulaikha explained that her main role in this inspection is to ensure that all documents related to OSN coaching are in accordance with the established standards. The documents checked include syllabus, learning materials, practice questions, student evaluation results, and coaching programs.

Syllabus and Learning Materials: Ms. Zulaikha stated that the syllabus used has been adapted to the applicable OSN curriculum. The learning materials cover all the important topics required for OSN, with difficulty levels varying from basic to advanced. Additional materials are also provided to help students better understand complex concepts.

Practice Questions: He also ensured that the practice questions given to students reflected the characteristics of OSN questions, which were non-routine and analytical in nature. Practice questions are given regularly, at least twice a week, with a variety of question types including multiple choice, essay, and practical questions.

Student Evaluation Results: Ms. Zulaikha monitors student performance through practice questions and periodic evaluations. Evaluation results show significant improvement in comprehension of the material and ability to solve more complex problems. Feedback is given directly and constructively to help students improve their performance.

Coaching Program: He explained that a structured and systematic coaching program is essential in preparing students for OSN. The program is run with a regular practice schedule, sufficient practice duration, and various supporting activities such as group discussions and practical experiments. Full support from the school is also instrumental in the success of this program.

Through the examination of this document checklist, it can be concluded that Mrs. Zulaikha Hermi Pratiwi plays an important role in ensuring that all aspects of OSN coaching at SD Negeri 1 Pulongrambe run according to the set standards. A structured approach, attention to detail, and continuous support from the school are the keys to success in preparing students for this prestigious competition.

Figure 3 Simulation of OSN Elementary School

In this photo, we can see the classroom atmosphere during the OSN try-out simulation in Tawangharjo sub-district. The students sit at their desks, each with a laptop or exam materials in front of them, showing their readiness and seriousness in facing this simulation. The accompanying teachers were also present, giving directions and accompanying the students during the try out.

Through this try out simulation, it can be concluded that the students in Tawangharjo sub-district received comprehensive and intensive preparation for the OSN. This activity not only improved their academic skills but also built the confidence needed to compete at the national level. Support from schools and accompanying teachers played a crucial role in the success of this program, ensuring every student has a fair chance to develop their potential to the fullest.

3.1 Effective Learning Strategies

Teachers in Tawangharjo sub-district apply various effective learning strategies in guiding OSN SD students. One of the commonly used strategies is the *student-centered learning* approach (Sinurat et al., 2021). This approach emphasizes student activeness in the learning process, where the teacher acts as a facilitator who guides students to discover and build their own knowledge, not just as a conveyor of information. Students are encouraged to actively ask questions, discuss, and solve problems independently or in groups, so that they can develop a deeper understanding of the subject matter. This is in line with the view of constructivism which emphasizes that knowledge is built by students through interaction with the environment and their learning experiences.

In addition, teachers also use a *problem-based learning* approach. This approach involves students in solving complex problems relevant to everyday life and OSN materials. Through this approach, students are trained to think critically, creatively, and be able to apply their knowledge in real situations. Teachers provide challenging problems and guide students to find solutions by applying the concepts they have learned (Patmala et al., 2023). This approach encourages students to think independently, search for relevant information, and cooperate with their peers in solving problems.

The use of technology is also an integral part of the learning strategies implemented by teachers in Tawangharjo sub-district. The use of technology-based learning media, such as learning videos, interactive simulations, and online learning platforms, can increase students' motivation and interest in learning. (Putri et al., 2023). Technology not only makes the learning process more interesting and interactive, but also gives students access to wider and more diverse learning resources, including Olympic materials from various sources (Fahim et al., 2023). Teachers also utilize technology to provide quick and personalized feedback to students, thus helping students identify their strengths and weaknesses in learning (I Made Surat et al., 2023).

Another effective learning strategy is the use of *drill* and guided discovery methods (Ikashaum et al., 2021). The drill method helps students to strengthen their understanding of basic math concepts and skills through repeated practice of problems. Meanwhile, guided discovery encourages students to discover mathematical concepts on their own through structured exploration and experimentation activities. The combination of these two methods can improve students' mathematical reasoning ability, which is the ability to think logically, analyze information, and draw valid conclusions.

In selecting learning strategies, teachers in Tawangharjo sub-district also consider students' learning styles. Some students may learn more easily by seeing (*visual*), while others prefer to learn by hearing (*auditory)* or by doing

(*kinesthetic*) (Nuralan et al., 2022). By understanding students' learning styles, teachers can adjust learning methods and materials to better suit each student's needs and preferences.

Teachers also act as facilitators in guiding students to develop the social and emotional skills needed to face the OSN competition. These skills include the ability to communicate, work together in teams, manage emotions, and cope with stress (Agustina et al., 2023). Teachers can facilitate group discussion activities, competition simulations, and self-reflection to help students develop these skills.

3.2 Challenges and Obstacles

Although teachers in Tawangharjo sub-district have made maximum efforts in guiding OSN primary school students, they are not free from various challenges and obstacles. One of the main challenges is the limited time to conduct intensive coaching, especially for teachers who have teaching responsibilities in regular classes and other administrative activities (Patmala et al., 2023). This limited time can make it difficult for teachers to provide in-depth material, conduct sufficient practice questions, and provide individualized attention to each student. This challenge is exacerbated by the fact that OSN SD not only covers material taught in class, but also additional materials that are more complex and require more time to master (Iskandar et al., 2023). Limited time can also be an obstacle in collaborating with other teachers or finding additional learning resources outside of school hours (Wihyanti et al., 2019).

Limited resources and supporting facilities are also a significant obstacle. Reference books relevant to OSN SD materials, teaching aids for practicum, and adequate laboratories are often not optimally available in schools in Tawangharjo Sub-district (Anggraini, 2021). This can hamper the learning and coaching process, especially for materials that require conceptual understanding and hands-on practice, such as science experiments. Limited access to quality learning resources can also make it difficult for teachers to update their knowledge and skills in accordance with the latest developments in the field of science (Pranata et al., 2023). This can have an impact on the quality of coaching provided to students, especially in terms of mastery of material and problem-solving strategies (Dodi Yudo Setyawan et al., 2023).

In addition to limited time and resources, some teachers also find it difficult to understand the material and characteristics of OSN questions that tend to be different from the questions usually taught in class. Primary school OSN questions are often *non-routine*, require high analytical skills, and sometimes use language that is different from everyday language. This requires teachers to continue to learn and develop themselves in order to guide students effectively. This challenge is made more complex by the periodic changes in the curriculum, so teachers must continue to adapt to new materials and learning approaches (Pambudi, 2017). In addition, some teachers may also feel less confident in their ability to guide students in high-level competitions such as OSN SD (Cahya et al., 2023).

Support from the school and parents is also an important factor in overcoming these challenges. Schools can provide support in the form of training and professional development for teachers, providing adequate learning resources, and setting flexible schedules so that teachers have sufficient time to provide coaching (Dahoklory et al., 2023). In addition, schools can also facilitate cooperation between OSN mentor teachers and teachers of other subjects, so that there is a useful exchange of knowledge and experience. (Pranata et al., 2023). Parents are also expected to provide moral support and motivation to their children who take part in OSN SD, as well as cooperate with teachers in monitoring students' learning development (Putri et al., 2023). Active involvement of parents in the coaching process can have a positive impact on student motivation and self-confidence (Nabela et al., 2021).

The involvement of other parties, such as universities and related institutions, can also make a significant contribution. Universities can provide training and mentoring to teachers, as well as provide access to laboratory facilities and more complete learning resources (Dahoklory et al., 2023). Collaboration between schools and universities can bridge the gap between theory and practice, allowing teachers to effectively apply the knowledge and skills gained from training in the classroom. Relevant institutions, such as local governments and teachers' professional organizations, can provide policy support and continuous professional development programs for OSN SD mentor teachers. This support can take the form of financial incentives, awards, or opportunities to attend higher-level training and seminars.

The challenges and obstacles faced by teachers in guiding OSN SD students are complex and require comprehensive solutions. With collaboration and support from various parties, it is hoped that teachers can overcome these challenges and provide optimal coaching for students, so as to improve their achievements in the OSN SD event.

4. Discussion

The findings of this study reveal that efforts to improve the effectiveness of mentoring OSN primary school students in Tawangharjo sub-district have become a major focus for teachers, schools and other stakeholders. Various initiatives have been undertaken to overcome existing challenges and obstacles, and maximize students' potential in achieving achievements in the field of science.

One important finding is the central role of training and *workshops* in improving the competence of primary school OSN mentor teachers (Fahim et al., 2023). These trainings not only focus on deepening the Olympic material, but also on developing effective learning strategies, using technology in learning, and optimizing the management of the coaching process (Pranata et al., 2023). This shows that improving teacher competence is not only about mastering subject matter, but also about how to deliver that material in an interesting and effective way to students.

The importance of teacher training is also supported by research Cahya et al. (2023) which states that teachers need to continue to improve their competence in order to provide quality guidance and counseling services to students. The trainings provided are also a forum for teachers to share experiences and knowledge, so as to broaden their horizons and increase their motivation in guiding students (Dahoklory et al., 2023). This finding suggests that teacher training is not only about knowledge transfer, but also about building a learning community among teachers, where they can support and inspire each other.

In addition to teacher training, research findings also show that the availability of resources and supporting facilities, such as reference books, teaching aids, and laboratories, are important factors in the effectiveness of OSN SD mentoring (Siregar et al., 2023). Schools in Tawangharjo sub-district have made efforts to improve the availability of these resources by allocating special funds and collaborating with universities and related institutions (Dahoklory et al., 2023). This is in line with research by Suhendar & Yanto (2023) which shows that the availability of adequate learning resources can increase student activeness and learning achievement.

The availability of adequate resources and facilities not only gives students access to relevant information and learning materials, but also provides opportunities for them to do hands-on practice and experimentation. This can improve students' understanding of abstract science concepts, as well as foster their interest and motivation to learn further. In addition, cooperation with universities and related institutions can also provide students with access to wider and higher quality learning resources, such as libraries, laboratories, and experts in the field of science.

Improved communication and coordination between teachers, parents and school authorities is also an important finding in this study. Good communication between these three parties can create a conducive learning environment for students, where they feel supported and motivated to learn (Putri et al., 2023). Parents can provide moral support and motivation to their children, as well as help them in organizing study time and overcoming the difficulties they face (Nabela et al., 2021). Schools can facilitate this communication by organizing regular meetings between teachers and parents, as well as providing an *online* communication platform that is easily accessible to all parties (Puspitarini, 2022).

This finding is in line with previous research which shows that collaboration between teachers, parents and school authorities is crucial in the successful implementation of guidance and counseling in schools. This collaboration not only increases the effectiveness of OSN SD mentoring, but can also improve the overall quality of education.

Although various efforts have been made, this study also found several challenges that still need to be overcome. One of them is the lack of teacher understanding of the material and characteristics of OSN questions that are not routine (Wismar et al., 2023). To overcome this, teacher training needs to be improved intensively and continuously, with a focus on deepening Olympic material, developing problem-solving strategies, and analyzing OSN questions from previous years. In addition, schools also need to facilitate teachers to attend seminars, *workshops*, or other professional development activities relevant to OSN SD.

Another challenge that needs to be overcome is the lack of student interest in participating in OSN coaching activities (I Made Surat et al., 2023). This can be caused by various factors, such as lack of motivation, the perception that OSN is too difficult, or lack of support from parents. To overcome this, teachers and schools need to increase socialization about OSN SD, explain the benefits and advantages of participating in OSN, and create a coaching atmosphere that is fun and not too stressful. Teachers can also use innovative and engaging learning approaches, such as *gamification* or project-based learning, to increase students' interest and motivation.

The findings of this study have important implications for education development in Tawangharjo sub-district and other areas in Indonesia. Firstly, this study shows that improving teachers' competencies through training and *workshops* is a key step in improving the effectiveness of OSN SD mentoring. Therefore, there needs to be policies and programs that support teachers' continuous professional development, especially in science and technology.

Secondly, this study highlights the importance of the availability of adequate resources and supporting facilities in the learning process and coaching of OSN SD. Schools and local governments need to allocate sufficient budget for the procurement of quality books, teaching aids and laboratory equipment. In addition, cooperation with universities and related institutions needs to be improved to expand students' access to wider and higher quality learning resources.

Thirdly, this study confirms the importance of collaboration between teachers, parents and school authorities in supporting students' success in OSN SD. Open communication and mutual support between these three parties can create a conducive learning environment for students, thus increasing their motivation and learning achievement.

5. Conclusion

This research reveals that the role of teachers in mentoring participants of the National Science Olympiad (OSN) SD in Tawangharjo District is very crucial and multidimensional. Teachers not only function as teachers but also as mentors, motivators, and facilitators in the process of coaching students. Teachers in Tawangharjo sub-district use various effective learning strategies, such as student-centered learning and problem-based learning approaches, to prepare students for the OSN competition. They also utilize technology to increase students' motivation and interest in learning.

However, this study also identified a number of challenges faced by teachers in coaching OSN. The main challenges include limited time, resources and supporting facilities, as well as teachers' lack of understanding of the materials and characteristics of OSN questions. To overcome these challenges, improving teachers' competencies through continuous training and workshops is necessary. In addition, the availability of adequate resources and facilities, as well as support from schools, parents and related institutions, are also important to improve the effectiveness of mentoring.

Collaboration between teachers, parents and school authorities is a key factor in creating a conducive learning environment for students. Good communication between these three parties can help overcome various obstacles faced, as well as increase student motivation and learning achievement.

This research has several important implications for education development in Tawangharjo sub-district and other areas in Indonesia. Firstly, policies and programs that support teachers' professional development need to be strengthened, especially in science and technology. Secondly, adequate budget allocations for the procurement of books, teaching aids and laboratory equipment should be prioritized. Third, closer collaboration between schools, parents and related institutions needs to be improved to support students' success in OSN.

By implementing these findings, it is hoped that science education in Tawangharjo sub-district can continue to develop and produce students who excel at national and international levels. Improving the quality of OSN primary school coaching will not only benefit students, but also the overall development of science education in Indonesia.

References

Abidin, A. Z., Fajrie, N., & Khamdun, K. (2023). Motivasi Guru dalam Prestasi Lomba Cipta Syair (Puisi) Siswa SD 1 Bakalan Krapyak Kudus. *WASIS : Jurnal Ilmiah Pendidikan*, *4*(1), 25–30. https://doi.org/10.24176/wasis.v4i1.9675

Agustina, S., Jumri, R., Ramadianti, W., Asmara, A., Kusuma Yudha, R., Matematika, P., Keguruan dan Ilmu Pendidikan, F., Muhammadiyah Bengkulu, U., & Kewararaan, P. (2023). Pendampingan Persiapan Lcts Tingkat Kecamatan Bagi Siswa Smp Negeri 25 Bengkulu Utara. *Communnity Development Journal*, *4*(6), 13684–13689.

Anggraini, Y. (2021). Analisis persiapan guru dalam pembelajaran media manipulatif matematika di sekolah dasar. *JURNAL BASICEDU*, *5*(4), 2415–2422. https://doi.org/10.55904/educenter.v1i5.171

Asnawi, Iriyani, D., Prakoso, T., & Setijorini, L. E. (2021). Elementary School Teacher's Training and Coaching as Trustees of the National Science Olympiad (OSN) in Surabaya Using Science Practicum at SDN I Airlangga Surabaya. *Journal of Physics: Conference Series*, *2110*(1), 0–6. https://doi.org/10.1088/1742-6596/2110/1/012019

Cahya, N., Anjelifa, S. M., Wistiana, H. J., Fajrie, N., & Ardianti, S. D. (2023). *Peran Guru Dalam Melaksanakan Bimbingan dan Konseling Untuk Meningkatkan Kedisiplinan Siswa Kelas V Sekolah Dasar*. *3*(2), 2807–1107. https://unu-ntb.e-journal.id/pacu

Dahoklory, N., Rumlawang, F. Y., Patty, H. W. M., & .. (2023). Pembinaan Penyelesaian Soal-soal Kompetisi Sains Nasional Bidang Matematika untuk Guru dan Siswa SMA Negeri 2 Ambon. *... Untuk Ilmu MIPA Dan ...*, *1*(2), 56–62. https://ojs3.unpatti.ac.id/index.php/pengamatan/article/view/11108

Dinita, D. P., & Imran, M. E. (2024). Pengaruh Model Problem Based Learning Terhadap Hasil Belajar IPA Kelas V SD Negeri 25 Panaikang Kabupaten Bantaeng. *INNOVATIVE: Journal Of Social Science Research*, *4*(1), 6555–6567. https://j-innovative.org/index.php/Innovative/article/view/8616/5895

Dodi Yudo Setyawan, Lia Rosmalia, Nurfiana, N., & Melia Gripin Setiawati. (2023). Pelatihan Algoritma Dan Pemrograman Untuk Kompetisi Sains Nasional (Osn) Di Sman 1 Metro. *J-ABDI: Jurnal Pengabdian Kepada Masyarakat*, *2*(9), 6255–6260. https://doi.org/10.53625/jabdi.v2i9.4845

Fahim, K., Subiono, S., Imron, C., Herisman, I., Soleha, S., & Mufid, M. S. (2023). Peningkatan Kompetensi Guru dan Siswa SMAN 1 Kraksaan dan SMAS Taman Madya Kraksaan untuk Menghadapi Olimpiade Sains Kabupaten (OSK) Bidang Matematika dan Informatika di Kabupaten Probolinggo. *Sewagati*, *8*(2), 1366–1375. https://doi.org/10.12962/j26139960.v8i2.897

Gustini, S. S., & Nurjanah, N. (2024). PEMBELAJARAN BERDIFERENSIASI UNTUK MENINGKATKAN HASIL BELAJAR SISWA PADA MATA PELAJARAN BAHASA SUNDA. *JALADRI*, *10*(1), 48–54.

I Made Surat, I Komang Sukendra, I Dewa Putu Juwana, & I Wayan Widana. (2023). Pemibinaan Dan Pelatihan Olimpiade Sains Nasional (Osn) Tingkat Kota Bidang Matematika Bagi Siswa Sma Negeri 7 Denpasar. *Jurnal*

Pengabdian Kepada Masyarakat Widya Mahadi, *3*(2), 39–47. https://doi.org/10.59672/widyamahadi.v3i2.2979

Ikashaum, F., Mustika, J., Soeseno, Z. E., & Winata, B. B. (2021). Pembinaan Olimpiade: Peningkatan Kemampuan Penalaran Matematis. *JURPIKAT (Jurnal Pengabdian Kepada Masyarakat)*, *2*(2), 300–308. https://doi.org/10.37339/jurpikat.v2i2.618

Komang Wiratama, I., Fuadi, T. M., Yunita, E., Pratiwi, R., Kurniawan, D., Gede, I., & Sudipa, I. (2022). Selection Participants of Science Olympic Elementary School Using Fuzzy Profile Matching Method. *Jurnal Mantik*, *6*(2), 1850–1858.

Nabela, D., Kasiyun, S., Rahayu, D. W., & Akhwani, A. (2021). Analisis Gaya Belajar Peserta Didik Berprestasi selama Pandemi Covid-19 dalam Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 2653–2663.

Nuralan, S., BK, M. K. U., & Haslinda. (2022). Analisis Gaya Belajar Siswa Berprestasi di SD Negeri 5 Tolitoli. *PENDEKAR JURNAL: Pengembangan Pendidikan DanPembelajaran Sekolah Dasar*, *1*(1), 13–24. https://servirisma.ukdw.ac.id/index.php/servirisma/article/view/32

Nurfadila, Ananda, R., & Aprinawati, I. (2022). ANALISIS KEBIASAAN BELAJAR SISWA BERPRESTASI DI SD NEGERI 013 MUARA JALAI. *Edu Cendikia: Jurnal Ilmiah Kependidikan*, *2*(03), 477–481. https://doi.org/10.47709/educendikia.v2i03.1889

Patmala, K., Aien, N., Nada, N. Q., Salmila, Y., & Anggraini, R. S. (2023). PEMBINAAN OLIMPIADE MATEMATIKA DI SMP NEGERI 4 KOTA SUNGAI PENUH. *Servirisma*, *3*(1), 43–50. https://doi.org/10.21460/servirisma.2023.31.32

Pranata, O. D., Noperta, N., & Trisnawati, W. (2023). Pendampingan Olimpiade Sains Nasional Tingkat Kota Sungai Penuh Melalui Kerjasama dan Kolaborasi Sekolah-Kampus. *Dedikasi : Jurnal Pengabdian Kepada Masyarakat*, *2*(2), 324–334. https://doi.org/10.53276/dedikasi.v2i2.113

Puspitarini, D. (2022). Blended Learning sebagai Model Pembelajaran Abad 21. *Ideguru: Jurnal Karya Ilmiah Guru*, *7*(1), 1–6. https://doi.org/10.51169/ideguru.v7i1.307

Putri, D. F., Deny, F., Amijaya, T., Raming, I., Wigantono, S., Nurul, M., Mts, S. M. P., & Pada, M. A. (2023). PELATIHAN OLIMPIADE SAINS NASIONAL (OSN) BIDANG MATEMATIKA UNTUK SISWA-SISWI SMA/MA DI KOTA SAMARINDA. *Journal of Research Applications in Community Services*, *2*(3), 71–78.

Sarkity, D., Elvi, M., Liana, M., & Fitriyah, D. (2020). Pembinaan Olimpiade Sains Nasional Bidang Matematika Topik Statistika dan Peluang Pada Siswa SMP Negeri 4 Tanjungpinang. *Jurnal Anugerah*, *2*(1), 27–36. https://doi.org/10.31629/anugerah.v2i1.1977

Shamilah, M. U. (2020). *EKSTRAKURIKULER OLIMPIADE SAINS DALAM UPAYA MENINGKATKAN PRESTASI PESERTA DIDIK PADA AJANG KOMPETISI SAINS MADRASAH TINGKAT NASIONAL DI MADRASAH IBTIDAIYAH AT-TAQWA BONDOWOSO* (Issue April).

Sinurat, R., Tanjung, D. S., Anzelina, D., & Abi, A. R. (2021). Analisis Cara Belajar Siswa Berprestasi Kelas IV Di SDN 097376 Sippan. *Jurnal PGSD: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, *14*(1), 28–37. https://doi.org/10.33369/pgsd.14.1.28-37

Siregar, R. F., Hafiz, M., & Anisa, Y. (2023). Pendampingan Pelatihan Guru-Guru Sekolah Dasar dalam Mempersiapkan Olimpiade di Sekolah Dasar (SD) Darussalam. *Nanggroe: Jurnal Pengabdian Cendikia*, *2*(3), 439–447.

Suhendar, A. W., & Yanto, A. (2023). Pembelajaran Matematika Menyenangkan di SD Melalui Permainan. *POLINOMIAL: Jurnal Pendidikan Matematika*, *2*(1), 18–23.

Suherman, D. S., Rahim, F. R., & Arlis, S. (2020). Pelatihan Guru Pembina Olimpiade Sains Nasional Bidang IPA Disekolah Dasar. *Seminar Nasional …*, *1*(1), 536–541. https://garuda.kemdikbud.go.id/documents/detail/2001880

Wahyu Iskandar, D., Fatimah Zahrah, R., & Syahril Sidik, G. (2023). Analisis Peran Guru Dalam Memfasilitasi Peserta Didik Pada Keikutsertaan OSN Bidang Matematika. *Bersatu: Jurnal Pendidikan Bhinneka Tunggal Ika*, *1*(5), 165–176.

Wismar, T., Astika, Y. W., & Rahmi, H. (2023). IMPLEMENTASI OLIMPIADE SAINS NASIONAL (OSN) DI KABUPATEN BUNGO. *Jurnal Administrasi Sosial Dan Humaniora*, *7*(2), 219. https://doi.org/10.56957/jsr.v7i2.272