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Training on Developing Website-Based SAPA Science Process Skills Assessment for the Langsa City Science Teacher Working Group

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Abstract

Background: Science Process Skills (SPS) are important competencies in science learning because they emphasize students' critical, analytical, and practical thinking skills. However, the practice of SPS assessment in schools is still limited, mainly due to the dominance of conventional instruments and the limited use of digital technology.
Aims: This community service activity aimed to improve the understanding and skills of junior high school science teachers in Langsa City to develop and implement technology-based SPS assessments.
Method: This community service activity was a training and mentoring-based program which consisted of four main stages: socialization, training, technology implementation, and mentoring and evaluation, involving 25 science teachers as participants. This approach not only provided knowledge transfer but also ensured real implementation in the field through practical activities and continuous feedback. The evaluation instruments consisted of pretests and posttests, assessment products (student worksheets, rubrics, and SPS questions), and participant response questionnaires.
Results: The results of the activity showed an increase in the average pretest score from 60.4 to 92.8 on the posttest with an N-gain value of 0.8 (high category). In addition, more than 85% of teachers responded positively to the activity.
Conclusion: These findings indicate that training in developing SPS assessments integrating the *Smart Performance Assessment* (SAPA) platform, Canva, and ChatGPT has proven effective in strengthening teachers' competencies, both conceptually and practically, thereby supporting improvements in the quality of science learning.

A. Introduction

Science Process Skills (SPS) are a fundamental aspect of science learning because they play a role in developing critical and analytical thinking skills, as well as the ability to conduct scientific experiments (Ahmed et al., 2023; Hanifah et al., 2020). Through mastery of SPS, students are expected to be able to observe, classify, interpret data, and draw conclusions based on empirical evidence. However, in reality, SPS assessment in schools still faces a number of obstacles. Teachers tend to use conventional assessment instruments (Nurfitriani et al., 2018), such as multiple-choice or essay questions, which emphasize cognitive aspects rather than comprehensive scientific skills. This condition has implications for students' low ability to apply scientific knowledge in real practice.

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Ideally, SPS should be measured through practice-based authentic assessments, such as science practicums (Elfrida et al., 2021; Nurfitriani et al., 2018). However, the implementation of such assessments is often hampered by limitations in instruments, rubrics, and the availability of adequate laboratory facilities. The results of a survey of junior high school science teachers in Langsa City show that their understanding of SPS assessment is still limited and they have not yet optimally utilized technology to support the design and management of assessment results.

The development of educational technology has opened up new opportunities to deliver more effective, interactive, and data-based SPS assessments (Gizaw & Sota, 2023; Koomson et al., 2024; Latifah et al., 2024; Sari et al., 2023). One innovation that can be used is *Smart Performance Assessment* (SAPA)**,** a digital platform that allows teachers to compile, implement, and manage assessments online. SAPA is designed with assessment rubrics, student worksheets (LKPD), and a real-time feedback system that makes it easier for teachers to comprehensively evaluate students' SPS. However, the use of this technology is still minimal among teachers due to limited technical skills and experience in integrating digital assessments into learning (Erstiawan et al., 2022; Haq et al., 2023).

In addition to SAPA, other potential technological tools to support science assessment and learning are Canva and ChatGPT. Canva, as an interactive visual design application, can be used by teachers to design worksheets, posters, or digital teaching materials that are attractive and easy for students to understand. Through its flexible template feature, teachers can integrate practice-based assessment instruments with a more communicative display, thereby increasing student engagement in the learning process (Kharissidqi & Firmansyah, 2022; Rohmiasih et al., 2023). Meanwhile, ChatGPT, as a language-based Artificial Intelligence (AI), provides new opportunities in compiling questions, assessment rubrics, and simulations of questions based on *higher-order thinking skills (*HOTS). ChatGPT can also function as a digital assistant that helps teachers develop assessment instruments more efficiently and adaptively to learning needs (Asrul et al., 2024; Hanis & Wahyudin, 2024).

Through the integration of SAPA, Canva, and ChatGPT, teachers are expected not only to understand the concept of authentic assessment, but also to have practical skills in implementing technology-based digital assessment. Therefore, comprehensive training is required. The objective of this community service activity is to improve the competencies of MGMP (Subject Teacher Working Group) science teachers in Langsa City in developing and implementing technology-based SPS assessments through the SAPA website. Through this training, it is hoped that teachers will be able to develop more accurate assessments in evaluating students' science process skills and be able to optimize the use of technology in supporting science learning. In addition, this training will also provide an opportunity for teachers to share their experiences and best practices in implementing digitally based SPS assessments. This step is expected to improve the quality of science learning, strengthen teacher professionalism, and support the achievement of Sustainable Development Goals (SDG 4: Quality Education) through the provision of a more inclusive, innovative, and sustainable assessment system.

B. Methods

This community service activity was carried out in August to September 2025 at the Science Laboratory of SMP Negeri 9 as the venue for regular activities of the Langsa City Science Teacher Working Group (MGMP IPA). The community service activity consisted of a series of activities including socialization, training, technology application, as well as mentoring and evaluation. The main objective of this activity was to introduce the concept of authentic and practice-based SPS assessment while also improving teachers' competence in developing assessment instruments relevant to science learning needs. In addition, teachers were directed to utilize digital technologies such as the SAPA website, Canva, and ChatGPT as innovative tools to support practice-based assessment. This activity was carried out in the Langsa City Junior High School Science MGMP forum, involving 25 science teachers as active participants.

The initial stage of the activity was a socialization that aimed at providing participants with an understanding of the objectives, benefits, and plans for the activities to be carried out. At this stage, teachers were introduced to the concept of authentic SPS assessment, the importance of practice as a basis for assessment, and the use of Canva, ChatGPT, and SAPA as digital assessment media. The socialization also served as a forum for interactive discussion to explore the needs and readiness of participants, as well as to explain the flow of activities from training to evaluation.

After that, the activity continued with training focused on improving teachers' knowledge and skills in developing practice-based assessments. Through workshops and simulations, participants were assisted in

designing assessment instruments in the form of student worksheets, assessment rubrics, and science practicum questions. Canva was used to enrich the appearance of the instruments to make them more interactive, while ChatGPT was used to assist in the preparation of questions and assessment rubrics for SPS. This training not only improved technical skills but also encouraged collaboration among teachers in producing more varied and applicable assessment instruments.

The next stage was technology implementation, which focused on integrating assessment products into the SAPA platform. Teachers were introduced to the main features of SAPA, such as uploading instruments, using digital rubrics, and managing assessment results. Through this activity, participants had the opportunity to implement the assessment instruments they had developed in digital form, making them easier to manage and apply in learning.

The final stage was mentoring and evaluation. At this stage, teachers were assisted in conducting digital assessments at their respective schools and were given the opportunity to consult on the effectiveness of their implementation. Evaluation was carried out through pretest and posttest to assess knowledge improvement, analysis of assessment products using quality rubrics, and response questionnaires to gather participant feedback. The evaluation results were used to identify the successes and obstacles in the activity, with the output targets being an increase in teachers' understanding of technology-based SPS assessment with a high category (N-gain > 0.7), the compilation of assessment products in the form of LKPD, assessment rubrics, and SPS practicum questions that are suitable for use, and more than 85% of participants giving positive responses to the activity.

C. Results and Discussion

1. Results

This community service was carried out in stages consisting of socialization, training, technology application, mentoring and evaluation.

1.1 Socialization Stage

The socialization stage was carried out as an initial step to provide an overview of the objectives, benefits, and activity flow to science teachers who are members of the Langsa City Science Teacher Working Group (MGMP IPA). This activity was attended by most of the teachers who had been designated as partners, demonstrating their high enthusiasm for the program.

At this stage, the community service team presented the concept of authentic and practice-based SPS assessment, while also introducing the use of Canva, ChatGPT, and the SAPA platform as digital assessment tools. Participants were actively engaged in the presentation, especially when given concrete examples of how these three technologies could support the development of more interactive assessment instruments tailored to science learning needs.

Figure 1. Socialization of digital-based SPS assessment

The socialization activity (Figure 1) was also accompanied by an interactive discussion session. Through this activity, teachers conveyed various obstacles they faced in designing and implementing SPS assessments, such as limited understanding of authentic assessment, difficulties in utilizing digital applications, and limited laboratory facilities. This discussion was important because it provided a realistic picture of the partners' conditions, enabling the team to adjust the training materials and strategies for the next stage.

1.2 Training Stage

The training stage was the core of the outreach activity, which aimed to improve science teachers' understanding and practical skills in developing SPS assessments (Figure 2). At this stage, teachers were facilitated to explore the concept of authentic assessment, which emphasized the importance of observing, interpreting data, conducting experiments, and drawing scientific conclusions. This understanding was important considering that conventional assessments tend to only assess cognitive aspects, thus not fully describing students' science process competencies.

Figure 2. Providing SPS Training Material

The training activities did not stop at the theoretical aspects but emphasized direct practice in developing assessment instruments. Teachers were guided to produce concrete products in the form of student worksheets, assessment rubrics, and science practicum questions that were oriented towards process skills. Through group work, participants discussed and exchanged experiences, creating collaboration that enriches ideas and produces a variety of assessment designs. The initial products showed creativity in the selection of question types and assessment indicators, although some instruments still need improvement, especially in terms of the clarity of the rubrics and their suitability for the learning objectives.

(a) (b)

Figure 3. (a) Use of Canva; and (b) ChatGPT and Hands-on Practice with Participants

1.3 Technology Implementation Stage

The technology implementation stage focused on integrating the designed assessment instruments into SAPA**.** This platform was chosen because it had features that support the implementation of digital SPS assessments, such as instrument uploading, online assessment rubric compilation, and a more transparent assessment result management system. At this stage, teachers were trained to recognize the main features of SAPA and practice them directly (Figure 4).

Figure 4. Practice of integrating assessments into the SAPA platform

Participants were instructed to upload the LKPD, practical questions, and assessment rubrics they had compiled into SAPA. This process provided teachers with real experience in adapting the format of instruments that were originally in document form into interactive digital content. Some teachers initially experienced technical difficulties, particularly in adapting the rubric format to the available system, but through guidance and discussion, these obstacles were overcome. This process also trained teachers' adaptation skills to new technologies that are urgently needed in the context of digital learning.

Next, teachers conducted a simulation of science practical assessments using SAPA. In this simulation, teachers not only tested the instruments they had created, but also practiced how to provide digital feedback to students quickly and transparently. This activity opened up new insights that digital assessments can shorten assessment time, minimize subjectivity, and provide results that can be immediately accessed by students. Teachers assessed SAPA as a practical solution to overcome the obstacles of manual assessments, which have been time-consuming and labour-intensive.

1.4 Mentoring and Evaluation Stage

A final evaluation was conducted to assess the effectiveness of the community service activities in improving the understanding and skills of science teachers in the Langsa City MGMP regarding technology-based SPS assessment. The evaluation included an analysis of pretest–posttest results, average scores and N-gain, as well as participant responses.

Table 1. Comparison of Pretest–Posttest

Participants	Score	
	Pretest	Posttest
1	70	100
2	50	100
3	70	100
4	70	90
5	60	90
6	50	100
7	90	100
8	70	100
9	70	90
10	70	80
11	60	90
12	40	80
13	80	100
14	80	90
15	50	80
16	50	80
17	70	90
18	80	100
19	10	90
20	70	100
21	60	90
22	20	90

Participants	Score	
	Pretest	Posttest
23	80	100
24	40	90
25	50	100

The pretest–posttest comparison results in Table 1 show an increase in scores for almost all participants. Before the activity, most teachers scored between 40 and 70, with some scoring only 10 to 20. After the activity, most participants' scores increased significantly to 90–100. Only a small number of participants showed a moderate increase, but none experienced a decrease. This confirms that the series of activities was effective in significantly improving the participants' initial understanding.

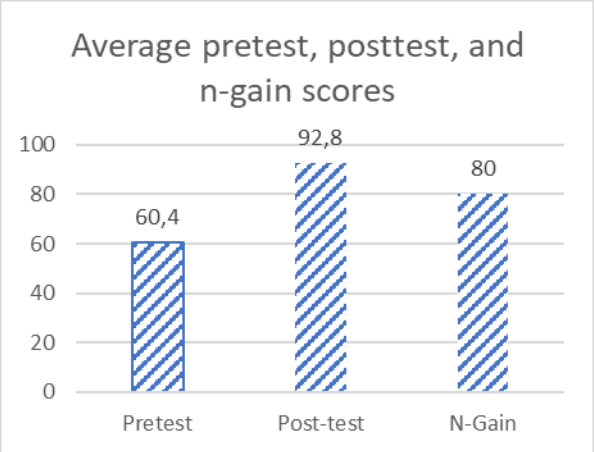

Figure 5. Average pretest, posttest, and N-gain scores

The average pretest and posttest scores in Figure 5 show an increase from 60.4 on the pretest to 92.8 on the posttest**.** An N-gain value of 0.8 is classified as high, indicating the effectiveness of the activities in improving teacher competence. This achievement is in line with the findings of McGowen & Davis (2014), who stated that an N-gain value above 0.7 indicates a substantial improvement in the learning process. Similar findings were also reported by Sugiarto et al. (2023), where practice- and technology-based training proved to be effective in improving teachers' skills in the high category (Fauziah & Rohmawati, 2025; Siswanti et al., 2024). Thus, this community service activity not only provided conceptual understanding but also facilitates the transformation of teachers' skills through direct experience.

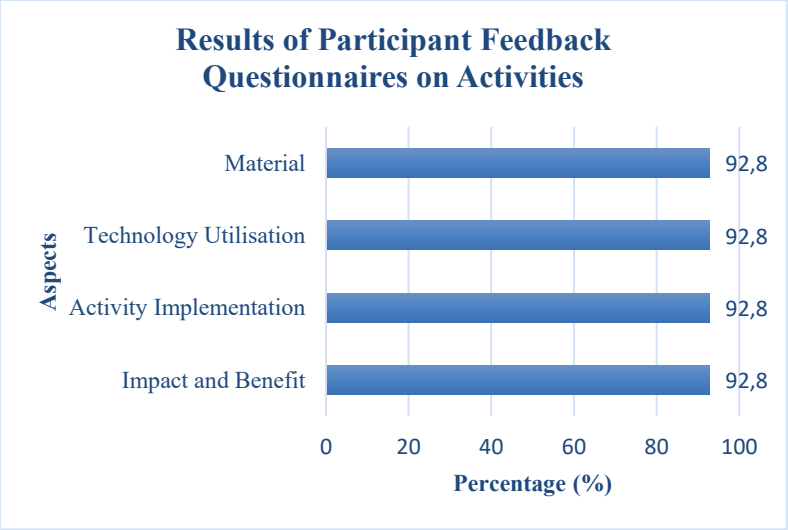

Figure 6. Participants' feedback to the community service activities conducted

Based on participants' feedback on the activities in Figure 6, the response was very positive. The majority of teachers considered the activities useful, enhancing their understanding and providing new skills in utilizing SAPA, Canva, and ChatGPT technologies. Participants stated that the material provided was

relevant to their needs at school, particularly in designing student worksheets, assessment rubrics, and practical science questions. Their enthusiasm was evident from their high participation in discussions and their eagerness to try out the introduced technologies. These results are consistent with the research by Entriza & Puspitasari (2025), which emphasizes that teachers' involvement in technology-based training is directly proportional to their motivation to innovate in learning.

2. Discussion

The results of the socialization showed that teachers gained an initial understanding of the urgency of practice-based SPS assessment and the potential use of digital technology to support assessment. In addition, the discussion forum raised participants' awareness of the importance of assessment innovation in the digital age. This is in line with the findings of several previous studies which emphasize that the active involvement of teachers in the early stages of the training program is crucial to the success of subsequent professional development activities (Budyartati et al., 2024; Eriyanti et al., 2022; Upa et al., 2024).

To strengthen technical skills, participants were introduced to two digital tools that support assessment innovation, namely Canva and ChatGPT (Figure 3). Canva was used to enrich the appearance of LKPD and assessment instruments to make them more attractive, interactive, and communicative for students. Teachers assessed Canva as an easy-to-use medium that was very helpful in designing visual-based instruments. Meanwhile, ChatGPT was utilized as a digital assistant to generate SPS-based questions based on SPS and assessment rubrics. This technology is considered capable of accelerating the question compilation process, providing new inspiration, and enabling adjustments to the context of science learning (Merentek et al., 2023; Serdianus & Saputra, 2023).

Teachers' responses to the use of these two technologies were very positive. Many participants stated that the use of Canva and ChatGPT not only saved time but also opened up new insights into how assessments could be developed more creatively and in line with student characteristics. The final results of the training phase showed that all participants were able to produce assessment products, and their skills in integrating practical aspects and digital technology had improved significantly. These findings reinforce previous research emphasizing the importance of practice-based training to enhance teachers' capacity, especially when combined with the use of educational technology relevant to current needs (Ridoh et al., 2024).

The results of the technology implementation phase showed that most teachers were able to integrate assessment instruments into SAPA and conduct digital assessments independently. The participants' enthusiasm was evident from their active involvement in trying out SAPA features and sharing their experiences regarding the benefits gained.

This integration contributed significantly to strengthening teachers' skills in utilizing digital technology and confirming that technology-based assessment can be a strategic alternative in improving the quality of learning (Wartinah et al., 2025). Thus, the technology implementation stage is an important milestone in shifting the paradigm of teachers from manual assessment to digital assessment that is more effective, efficient, and in line with the demands of modern learning (Naufal et al., 2024).

Thus, the evaluation results indicate that this community service activity not only enhances teachers' conceptual knowledge but also strengthens their practical skills in integrating technology into science assessment. This provides a tangible contribution to improving teachers' professionalism and supports efforts to enhance the quality of science learning in schools.

2.1 Implications

Community Service Activities carried out in collaboration with the Langsa City Science Teacher Working Group (MGMP IPA) have several tangible benefits for teachers, students, and educational institutions. Through Canva training, teachers acquired skills in designing more attractive, interactive, and SPS-based Science Practicum Student Worksheets (LKPD). This helped create teaching materials that were not only informative but also able to train students' scientific thinking skills. By utilizing ChatGPT, teachers were able to compile SPS-based questions and develop assessment rubrics more quickly, systematically, and with greater variety.

Through the use of the SAPA website, teachers are introduced to an efficient digital assessment system that meets the demands of 21st-century learning. Teachers are no longer stuck with conventional methods but are encouraged to use engaging digital media and integrate AI technology into learning planning and evaluation. More engaging and contextual SPS-based LKPDs can foster student motivation to learn. SAPA-based assessments enable students to receive faster, more accurate, and more transparent feedback. Through

this activity, the Science MGMP functions optimally as a forum for teacher collaboration in developing innovative learning tools that can be adopted and disseminated in their respective schools.

2.2 Research Contribution

The outcomes of this community service activity contribute significantly to the development of research in the field of digital-based learning assessment. This program demonstrates that teachers' understanding and skills in integrating digital tools such as Canva for designing SPS-based worksheets, ChatGPT for generating assessment items and rubrics, and the SAPA website for conducting digital assessments can be enhanced effectively through targeted training. The findings provide empirical evidence that professional development programs focusing on digital technology integration can positively impact teachers' competencies in assessment design and implementation. Furthermore, the activity offers a practical model of how digital platforms can streamline the evaluation of students' science process skills in laboratory-based learning, thereby contributing to the literature on digital pedagogy and assessment innovation.

2.3 Limitations

The implementation of this community service activity still has several limitations that need to be considered in the development of similar programs in the future. First, participation in the activity was still limited to some teachers who were members of the Langsa City Science Teacher Working Group (MGMP IPA), so it did not yet cover all science teachers who are members of the forum. This means that the benefits of the activity are not yet fully distributed to all members. Second, the relatively short training period meant that the material could not be explored in a more comprehensive manner, particularly in the advanced practice of using Canva, ChatGPT, and SAPA for digital assessment.

Third, the tasks of designing LKPD, rubrics, and questions based on SPS were carried out in groups, so that the individual skills of teachers could not be fully measured, and the level of mastery still varied among participants. Fourth, supporting facilities and infrastructure in partner schools were still limited, such as the availability of computers, stable internet access, and other digital infrastructure, which affects the smooth implementation of comprehensive digital assessment in the classroom.

Given these limitations, future community service activities are expected to involve more teachers, extend the duration of training, assign individual tasks, and be supported by adequate technological facilities so that the implementation of SPS-based digital assessments can run more optimally.

2.4 Suggestions

Teachers are expected to continuously apply technology-based SPS assessment in learning. Support from schools and MGMP needs to be increased, both in the form of further training and the provision of digital facilities. Further research is recommended to test the effectiveness of this assessment on improving student learning outcomes so that its impact is more comprehensive.

D. Conclusion

The community service activity in collaboration with the Langsa City Science Teacher Working Group (MGMP IPA) effectively enhanced teachers' understanding and skills in developing and implementing technology-based SPS assessments. Through stages of socialization, training, technology application, and mentoring, teachers gained systematic and applicable learning experiences. The integration of SAPA, Canva, and ChatGPT proved to strengthen teachers' conceptual and practical competencies, receiving positive responses from participants as it aligned with the needs of science learning in schools. Overall, this program effectively supported teacher professionalism and contributed to improving the quality of science education. Future initiatives should ensure sustainability through continuous mentoring and strategic collaboration with MGMP to institutionalize technology-based assessment innovations in educational practice.

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F. Author Contribution Statement

MDP coordinated the team in carrying out the service, providing training on the concepts and practices of SPS assessment preparation. IZ drafted articles and provided training on designing LKPD using Canva. AS guided teachers in the application of technology using ChatGPT and SAPA. CO analysed the data and results.

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