

Article

Implementation of Smart Lectures for Chemistry Teachers of the MGMP in Padang Panjang City

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Abstract. The Chemistry Teachers Working Group (MGMP) of Padang Panjang City serves as a forum for senior high school chemistry teachers in Padang Panjang to collaboratively develop their professional careers and scientific competencies. The teachers' enthusiasm to improve more effective, high-quality, and innovative learning was demonstrated through their request for training in designing and implementing E-Learning in senior high school chemistry instruction. The methods used in the introduction and development program related to E-Learning through the flagship product, Smart Lecture, were conducted through lectures, question-and-answer sessions, mentoring, and workshops. The results of the community service program showed that: (1) the training participants were able to understand the preparation, design, and implementation of high-quality and interactive E-Learning in senior high school chemistry instruction, thereby improving the quality of chemistry learning; (2) the chemistry teachers of the MGMP of Padang Panjang City were able to motivate other teachers to diversify the strategies used in senior high school chemistry instruction; and (3) chemistry teachers were able to apply and implement senior high school chemistry learning strategies using E-Learning.

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1. Introduction

Situation Analysis

Nowadays, the development and use of Information and Communication Technology (ICT) in Indonesia have grown rapidly. It can be said that Indonesian society cannot be separated from products, services, and activities involving ICT (such as computers, laptops, mobile phones, communication networks, the Internet, browsing, e-mailing, and social media activities) in their daily lives. Almost all formal and informal sectors utilize ICT products and services in carrying out their tasks and improving their performance. This also includes the education sector, where ICT has become an essential facility and infrastructure that is inseparable from the learning process (Effendi et al., 2019).

The teaching and learning process, which previously only took place in classrooms, can now be conducted without limitations of time and place through what is known as e-learning. E-learning is a learning system that uses electronic media and can be accessed via the internet (Firat, 2017; Chaeruman et al., 2018; Chaeruman et al., 2018). Further developments have led to the combination of face-to-face classroom learning with online learning, commonly referred to as blended learning, hybrid learning, and mixed-mode learning, which are different terms but share the same meaning (Linawati, 2016; Tshabalala et al., 2014; Patchan et al., 2014). Blended learning has been proven to offer many advantages. Research shows that 94% of lecturers believe that blended learning is more effective than classroom-based instruction alone. In line with this, other studies have also demonstrated that the use of blended learning aims to obtain benefits in improving learning outcomes. The advantages of blended learning have been confirmed through various studies, particularly in improving the quality of learning in higher education (Songkaeo and Yeong, 2016), increasing learning activities and outcomes in higher education (Bryan et al., 2016), and enhancing the effectiveness of distance education (Fatima et al., 2019).

Teachers' teaching professionalism can be developed through activities conducted in the Subject Teachers Working Group (MGMP). MGMP activities aim to broaden teachers' insights into learning strategies, enhance their skills in delivering more professional instruction, and improve the quality of the educational and learning processes, as reflected in improved student learning outcomes (Depdiknas, 2008). Efforts to strengthen the role of MGMP in developing teachers' professionalism are carried out through various instructor and core teacher training programs, improvement of facilities and infrastructure, and enhancement of MGMP management quality. These efforts support teachers' performance by encouraging them to collaboratively review and evaluate learning practices with other teachers within working groups. The aspects reviewed include the learning process conducted collaboratively and continuously to improve student learning outcomes. Therefore, MGMP also plays an important role in supporting the development of teachers' professionalism and performance (Dea Alita et al., 2014).

The Chemistry Subject Teachers Working Group (MGMP) of Padang Panjang City serves as a forum for senior high school chemistry teachers in Padang Panjang to collaboratively develop their professional careers and scientific competencies. Within the Chemistry MGMP of Padang Panjang City, various schools in Padang Panjang are involved. Adequate school facilities and infrastructure can support the development, design, and implementation of E-Learning in senior high school chemistry instruction integrated with the flagship research product, Smart Lecture.

These schools have adequate classrooms, spacious fields, laboratories, including ICT rooms and supporting facilities. The chemistry teachers who are members of the Chemistry MGMP of Padang Panjang City are also considered competent in terms of their teaching qualifications. The teachers appear open-minded and enthusiastic about improving the quality of their instruction, one of which is by adopting more effective, high-quality, and innovative learning approaches.

The teachers' enthusiasm to improve more effective, high-quality, and innovative learning is reflected in their request for training on the design and implementation of E-Learning in senior high

school chemistry instruction. This was revealed through discussions with chemistry teachers in the Chemistry Subject Teachers Working Group (MGMP) of Padang Panjang City, who showed great enthusiasm for training related to the design and implementation of E-Learning in senior high school chemistry learning. This initiative is closely related to teachers' career development through the production of innovative outputs in the form of designing and implementing E-Learning in chemistry instruction by chemistry teachers who are members of the Chemistry MGMP of Padang Panjang City.

Solutions and Targets

In order to develop high-quality E-Learning that can improve learning to be more effective, high-quality, and innovative, it is necessary to conduct training and mentoring for teachers in the preparation, design, and implementation of E-Learning in senior high school chemistry instruction integrated with the flagship research product, Smart Lecture. The mentoring activities begin with the introduction of senior high school chemistry learning strategies using Smart Lecture, followed by the development and design of these strategies, and continued with training on their implementation. This program is intended for chemistry teachers who are members of the Chemistry Subject Teachers Working Group (MGMP) of Padang Panjang City. Through this program, it is expected that the teachers will become proficient in the preparation, design, and implementation of E-Learning in senior high school chemistry instruction integrated with the Smart Lecture research product, thereby improving the effectiveness, quality, and innovativeness of the learning process.

2. Experimental Section

2.1. Location and Time

The location of this community service program was the Chemistry Subject Teachers Working Group (MGMP) of Padang Panjang City. The program was conducted using an online training system by preparing training modules and content integrated with teleconferencing using Zoom, as well as offline activities in the form of mentoring and Smart Lecture workshops. The implementation period of the program was from August 8 to September 30, 2022.

2.2. Target Audience

After the completion of this training program, it is expected that teachers will have broader knowledge and understanding of E-Learning and the development of Learning Management Systems (LMS). Through this training, teachers are also expected to be able to independently design and develop E-Learning systems, as well as produce ICT-based products and skills in an effective and efficient manner.

2.3. Community Service Methods

The methods used in the program for the introduction and development related to E-Learning through the flagship product, Smart Lecture, were carried out through the following activities:

1. Material Presentation and Question-and-Answer Session

Participants were provided with knowledge on the introduction to senior high school chemistry learning strategies using Smart Lecture. Question-and-answer sessions were conducted during the material presentation, practice sessions, and workshops.

2. Mentoring and Workshops

These activities were conducted to train participants' skills in developing and designing E-Learning in accordance with the guidelines that had been provided. During the practical sessions, participants were divided into several groups and guided by instructors. After successfully developing and designing E-Learning based on the provided guidelines, the training was continued with the implementation of senior high school chemistry learning strategies using Smart Lecture.

The activities carried out included workshops and mentoring in the preparation, design, and implementation of E-Learning in senior high school chemistry instruction. In the first stage,

participants received materials related to the introduction of senior high school chemistry learning strategies using E-Learning. Furthermore, in the second stage, participants were required to develop and design E-Learning based on the guidelines that had been provided, using mentoring, participatory, and guided methods. In the third stage, participants submitted their scientific work assignments, followed by discussions involving all community service personnel and training participants. During these activities, the teachers were provided with materials on the main criteria of an effective E-Learning system, setting topics and sessions in E-Learning, posting and publishing content in E-Learning, and techniques for writing evaluation questions for E-Learning using Smart Lecture.

Indicators

1. At least 90% of the training materials delivered are expected to enhance participants' knowledge in the fields of E-Learning, chemistry learning strategies, and scientific writing.
2. At least 90% of the training participants are expected to produce E-Learning content for chemistry instruction integrated with the flagship product, Smart Lecture.

Evaluation Methods

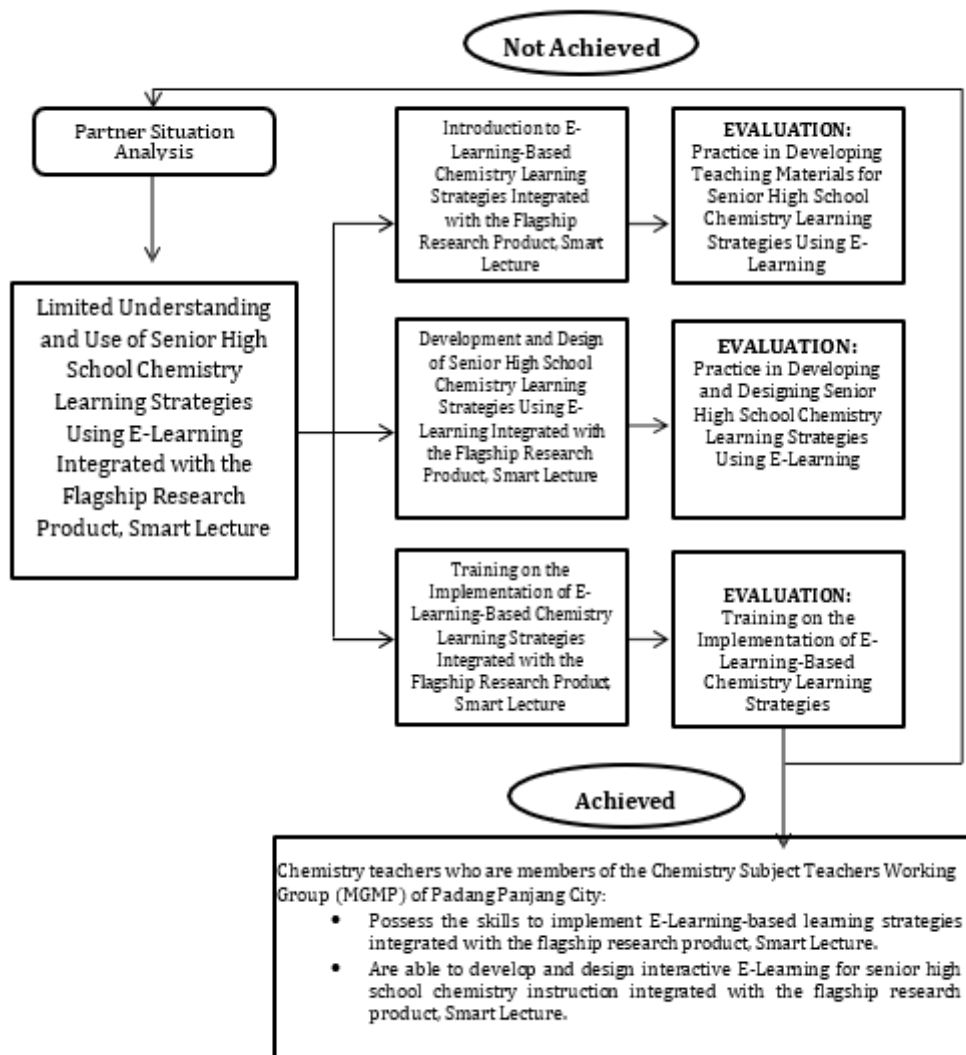


Figure 1. Evaluation Design

3. Results and Discussion

The initial stage of this community service program involved the introduction of Smart Lecture and the development of E-Learning. The preparation activities were carried out from August to September 2022. During this preparation phase, the community service implementation team conducted coordination, communication, discussions, question-and-answer sessions, and the preparation of training materials using the Chemistry Smart application. Detailed descriptions of the activities in the preparation phase are presented in Table 1.

Table 1. Details of Activities in the Preparation Phase

Week	Topics	Instructor / Person in Charge
1	Topic 1: Introduction to E-Learning	Rahadian Zainul
	Topic 2: E-Learning Integrated with the "Smart Lecture"	Rahadian Zainul Budhi Oktavia
	Topic 3: Design and Development of E-Learning for Senior High School Chemistry Instruction	
2	Topic 4: Development of E-Learning for Senior High School Chemistry Instruction (Setting Topics and Sessions in E-Learning)	Dony Novaliendry Rahadian Zainul
	Topic 5: Development of E-Learning for Senior High School Chemistry Instruction (Posting and Publishing Content in E-Learning)	
3	Topic 6: Development of E-Learning for Senior High School Chemistry Instruction	Rahadian Zainul Rahadian Zainul
	Topic 7: Finalization of E-Learning for Senior High School Chemistry Instruction	Dony Novaliendry
4	Topic 8: Development of E-Learning and Moodle Installation	Rahadian Zainul Budhi Oktavia
	Topic 9: Moodle Configuration for Chemistry E-Learning	
5	Topic 10: Development of E-Learning for Grade 10, 11, and 12 Chemistry	Rahadian Zainul Dony Novaliendry
	Topic 11: Learning Management Systems (LMS), Content Development, and Evaluation Techniques	
6	Topic 12: Management of E-Learning for Senior High School Chemistry Instruction	Rahadian Zainul Budhi Oktavia
	Topic 13: Evaluation and Analysis of E-Learning Management for Senior High School Chemistry Instruction	Dony Novaliendry
	Evaluation Questions	

Furthermore, in the second stage, participants were required to develop and design E-Learning in accordance with the guidelines that had been provided, using mentoring, participatory, and guided methods. The training participants were directed to access the **Smart Lecture** website at <https://elearning.insparagonsociety.org/>



Figure 2. Smart Lecture Website Interface



Figure 3. Services on the Smart Lecture Platform



Figure 4. E-Learning on the Smart Lecture Platform

Based on the evaluation results conducted during the preparation phase, it can be seen that the community service program through Smart Lecture has been carried out successfully. The evaluation outcomes can be summarized as follows: (1) All materials in the preparation phase were implemented without significant obstacles or issues; (2) Participants engaged in the activities with great enthusiasm and high motivation. This was indicated by their seriousness in performing tasks, active participation, eagerness to ask questions, and compliance with all given instructions. This may be attributed to the fact that the Smart Lecture materials are particularly appealing to chemistry teachers for developing teaching materials.

The next stage involved mentoring and practical activities in which teachers developed and designed E-Learning according to the provided guidelines. To ensure that the mentoring activities did not interfere with teaching hours, the sessions were scheduled to coincide with the regular MGMP meetings. During the practical activities, teachers were assisted by resource persons (the PKM Implementation Team). This stage was a follow-up to the socialization activities and aimed to enhance teachers' skills in developing and designing E-Learning for senior high school chemistry instruction, so that the resulting learning process would be more effective and interactive. Through this mentoring, teachers were indirectly guided to follow the correct procedures in the preparation, design, and implementation of E-Learning for senior high school chemistry. The mentoring activities can be seen in the following figure.



Figure 5. Mentoring and Workshop on the First Day



Figure 6. Mentoring on the Second Day

During the mentoring sessions, the training participants were able to apply the knowledge gained during the preparation phase into Smart Lecture, including setting topics and sessions, posting and publishing content, and creating evaluation questions in the E-Learning platform. The high level of participants' understanding was attributed to the materials being relatively easy to achieve the objectives, as well as the presentation by the implementation team, which was accompanied by clear guidelines, making it easy to understand and follow the work process step by step. Therefore, it can be concluded that the activities were successfully conducted, and the output targets were fully achieved. The training participants were also able to use E-Learning on Smart Lecture skillfully.

Based on this discussion, the majority of the output targets of this community service program have been achieved. This indicates that the chemistry teacher participants from MGMP Kota Padang Panjang demonstrated good skills in using Smart Lecture, and all participants expressed pride in the accomplishment of this training program, hoping to have the opportunity to participate again in the future with different materials.

4. Conclusion

The conclusions drawn from the implementation of Smart Lecture for chemistry teachers of MGMP Kota Padang Panjang are as follows:

1. The training participants were able to understand the preparation, design, and implementation of E-Learning for senior high school chemistry instruction in a high-quality and interactive manner, thereby enhancing the overall quality of chemistry learning.
2. The chemistry teachers of MGMP Kota Padang Panjang were able to motivate other teachers to diversify and adopt the implemented strategies for senior high school chemistry instruction.
3. All chemistry subject teachers were able to apply and implement E-Learning strategies effectively in senior high school chemistry instruction.

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