

Construction of Teaching Module Structure With Deep Learning Approach For Secondary School Teachers

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Abstract.

This community service was motivated by the fact that some teachers, particularly those at the junior high school level, still do not understand how to develop teaching modules using the deep learning approach, thus requiring guidance for these teachers. The purpose of this guidance is to facilitate junior high school teachers in developing teaching modules using the deep learning approach, with the subject of guidance being teachers at SMP STMC 4245 Baleendah, Bandung. This guidance method was carried out through problem identification, socialization of the deep learning approach, discussions and practicums on developing teaching modules using the deep learning approach, evaluation and reflection. The results of the activity showed that the guidance went well and received a positive response from the participants, where 86% of teachers stated that they really enjoyed the activity, 11% stated that they enjoyed it, and 3% still needed further guidance. The evaluation results also showed an increase in teachers' understanding and skills in developing teaching modules based on Deep Learning, as indicated by an increase in posttest results compared to the pretest. Teachers were able to integrate the principles of mindful learning, meaningful learning, and joyful learning into teaching modules that were designed according to the characteristics of their respective subjects. Thus, the coaching activities have proven effective in improving teachers' competency in developing Deep Learning-based teaching modules, thereby supporting the implementation of more meaningful, active, and student-centered learning.

Keywords: *teaching modules, teacher coaching and deep learning.*

I. INTRODUCTION

Facing the global challenges of the 21st century requires improving the quality of educators by providing quality resources for developing learning materials. Teachers play a strategic role in developing critical thinking, creativity, communication, collaboration, and a strong desire to learn. To achieve this goal, teacher competency needs to be enhanced by developing learning modules tailored to students' interests and characteristics, as well as the learning objectives they wish to achieve [1], [2]. The teaching module designed by the teacher in the learning process serves as a guide for teachers in implementing the learning process using a deep learning approach, where in this learning positioning students as the main subject in the learning process. This is in line with the national education policy by the Ministry of Primary and Secondary Education that in implementing the deep learning approach is a learning process oriented towards meaningful learning (meaningful learning), conscious learning (mindful learning), and joyful learning (joyful learning). This approach aims to develop deep conceptual understanding, high-level thinking skills, problem solving, collaboration, communication, and the ability to transfer knowledge in various life contexts. Thus, learning is not only oriented towards mastery of material, but also on the formation of students' competencies as a whole [3], [4].

The deep learning approach is an in-depth learning approach carried out by students in understanding concepts, thinking critically, solving and applying problems in real-life contexts and connecting new knowledge with previous experiences. The Deep Learning approach is based on three main principles, namely mindful learning, meaningful learning, and joyful learning, which aims to create an active, reflective, and student-centered learning experience. The Deep Learning approach encourages the development of 21st-

century competencies through authentic, collaborative, and contextual learning so that students are able to develop character, think critically, communicate, collaborate, be creative, and become responsible citizens.

Coaching is a process of mentoring, guidance, training, and reinforcement carried out in a planned, systematic, and sustainable manner to improve the knowledge, skills, attitudes, and competencies of individuals or groups in carrying out their duties and responsibilities. In the context of education, teacher coaching is a professional effort aimed at helping teachers develop pedagogical, professional, social, and personal competencies through various activities such as socialization, training, mentoring, discussion, practice, and reflection so as to improve the quality of planning, implementation, and evaluation of learning [5]. In coaching teaching modules with a deep learning approach, teachers are required to be prepared in designing and integrating activities through exploration, investigation, and reflection. Teachers are required to be able to design the learning process in the classroom actively and collaboratively. Therefore, the ability to compile this teaching module is an activity in improving teacher competency that needs to be carried out and developed through coaching activities [6].

Based on the results of needs identification at SMP STMC 4245 Baleendah, Bandung Regency, it was found that some teachers still experience difficulties in understanding the concept of Deep Learning and integrating it into the development of teaching modules. Most of the teaching modules used are still oriented towards delivering material, thus not fully facilitating students to think deeply, reflect, and relate learning to real-life problems. This condition indicates the need for systematic mentoring so that teachers have a conceptual understanding as well as practical skills in developing teaching modules that are in accordance with the Deep Learning approach. One form of effort that can be done is through community service activities in the form of coaching in the development of Deep Learning-based teaching modules. This coaching is designed through the stages of needs identification, socialization of the Deep Learning concept, discussions, practice of developing teaching modules, as well as evaluation and reflection on the results that have been compiled. These activities are expected to be able to improve teacher competence in developing quality teaching modules so that learning becomes more meaningful, contextual, and student-centered. Thus, the aim of this community service activity is to facilitate teachers of STMC 4245 Baleendah Junior High School, Bandung Regency in improving their ability to compile teaching modules using the Deep Learning approach as an effort to support improving the quality of learning.

II. SCIENTIFIC METHOD

This training program utilizes a deep learning approach to developing teaching modules in junior high schools. This involves problem identification, socialization of the deep learning approach, discussions, and practical work on developing teaching modules using the deep learning approach, as well as evaluation and reflection.

The problem identification method in this training program involves identifying the challenges faced by teachers in developing teaching modules using the deep learning approach. This requires teacher coaching to inform the development of these teaching modules. Prior to developing the deep learning approach, this identification was conducted through a survey of teacher and student needs in the field and interviews with target subjects, namely teachers and students at SMP STMC 4245 Baleendah Bandung.

The training program begins with a socialization of the Deep Learning approach, aimed at providing teachers with an understanding of the concepts, principles, and characteristics of Deep Learning, along with its implementation in developing teaching modules at the junior high school level. The socialization process is conducted interactively through material presentations, teaching module examples, and a question-and-answer session, allowing participants to gain a comprehensive understanding of developing teaching modules that integrate the principles of mindful, meaningful, and joyful learning. The activity then continued with a discussion and needs identification. At this stage, the community service team and teachers discussed their experiences developing teaching modules and identified various obstacles encountered in implementing the Deep Learning approach. The results of the discussions served as the basis for determining mentoring strategies

and adapting the coaching materials to the teachers' actual needs, ensuring that the activities were more effective and on-target.

The next stage is a practicum on developing Deep Learning-based teaching modules. Teachers are given the opportunity to develop teaching modules tailored to the subjects they teach, with direct guidance from the community service team. During the practicum, the team provides mentoring, monitoring, and feedback on each component of the developed teaching modules. This mentoring aims to ensure that the teaching modules accommodate learning activities that encourage students to think critically, solve problems, collaborate, reflect, and relate learning materials to real-life contexts.

The final stage is evaluation and reflection to determine the effectiveness of the coaching activities. Evaluation is conducted through a pre-test before the coaching and a post-test after the entire series of activities are completed to measure the improvement in teachers' understanding of developing Deep Learning-based teaching modules. Furthermore, reflection is conducted through discussions and consultation sessions with participants to identify benefits gained, challenges still encountered, and alternative solutions that can be applied in developing future teaching modules. The results of the evaluation and reflection serve as the basis for assessing the achievement of the activity's objectives and provide input for improvements in future coaching implementation.

These stages of socialization, discussion, practicum, evaluation and reflection, community service activities at STMC 4245 Baleendah Middle School are expected to be able to increase teachers' knowledge and skills in compiling Deep Learning-based teaching modules. This increase in competency is expected to have an impact on the development of higher quality teaching modules and support the implementation of active, meaningful and student-centered learning.

The implementation of community service activities in the form of coaching for the preparation of Deep Learning-based teaching modules for teachers of SMP STMC 4245 Baleendah showed positive results. After participating in the entire series of activities, teachers had a better understanding of the concepts and principles of Deep Learning and were able to implement them in the preparation of teaching modules in accordance with the applicable education policies for the 2025/2026 academic year. In addition to understanding the structure and components of teaching modules, participants were also able to integrate the principles of mindful learning, meaningful learning, and joyful learning into the learning design so that the modules prepared were more oriented towards active, contextual, and student-centered learning experiences.

Teacher competency improvement is evident not only in their conceptual understanding of the Deep Learning approach, but also in their skills in formulating learning objectives, designing learning activities, determining assessments, and developing learning reflections tailored to student characteristics. Through these coaching activities, teachers gain hands-on experience in developing teaching modules that can be applied to their respective subjects, thus supporting more effective and meaningful learning.

The needs identification process was carried out through coordination and discussion between the community service team and the school. This activity aimed to map the initial conditions, determine the level of teacher understanding of the development of Deep Learning-based teaching modules, and identify various obstacles faced in their implementation. Information obtained from the identification stage was used as a basis for developing a coaching program to suit the needs of teachers at SMP STMC 4245 Baleendah. Based on the identification results, the community service team and the school agreed to implement coaching activities that began with a socialization of the Deep Learning approach. The socialization stage aimed to strengthen the concept of learning policies, the characteristics of the Deep Learning approach, and its implementation in the development of teaching modules. This activity was carried out for five days through the delivery of materials, interactive discussions, case studies, and the provision of examples of teaching modules so that participants gained a comprehensive understanding before entering the practical phase of developing teaching modules. The series of implementation of the socialization activities is presented in Table 1.

Table 1. Implementation of Socialization

Time	Activity
Day-1	Identifying problems faced by teachers in developing teaching modules using a deep learning approach.
Day-2	Socialization of learning using a deep learning approach for junior high school students.
Day-3	Socialization of the independent learning curriculum content for junior high school students.
Day-4	Training on developing teaching modules using a deep learning approach.
Day-5	Socialization of teaching simulations using teaching modules using a deep learning approach.

Following the completion of the outreach activities, the community service team evaluated participant responses by distributing a questionnaire to determine teachers' level of acceptance of the material and the implementation of the coaching. The questionnaire results indicated that the majority of participants responded positively to the activities. A summary of the teacher responses is presented in Figure 2.

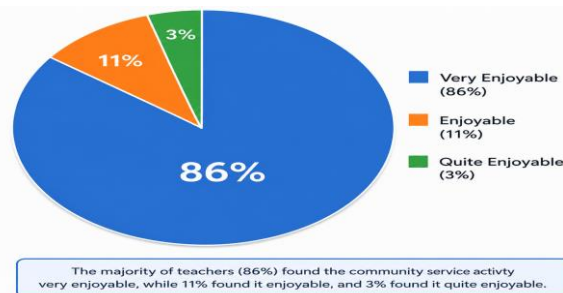


Fig. 2. Diagram of Teacher Responses to Socialization Activities

Based on the questionnaire results, 86% of teachers stated that they really enjoyed the coaching activities, 11% stated that they enjoyed it, while 3% of participants still experienced difficulties in understanding the material presented. These findings indicate that the socialization activities were well received by the majority of participants. Furthermore, the questionnaire results were used as the basis for holding a joint discussion session between the community service team and teachers to identify various obstacles faced in developing Deep Learning-based teaching modules. The results of these discussions then became a reference in implementing practical activities. To measure the effectiveness of the coaching, an evaluation was conducted through a pretest before the socialization and practical activities and a posttest after the entire series of activities were completed. A comparison of the two test results was used to determine the increase in teachers' understanding regarding the development of Deep Learning-based teaching modules. A summary of the evaluation results is shown in Figure 3.

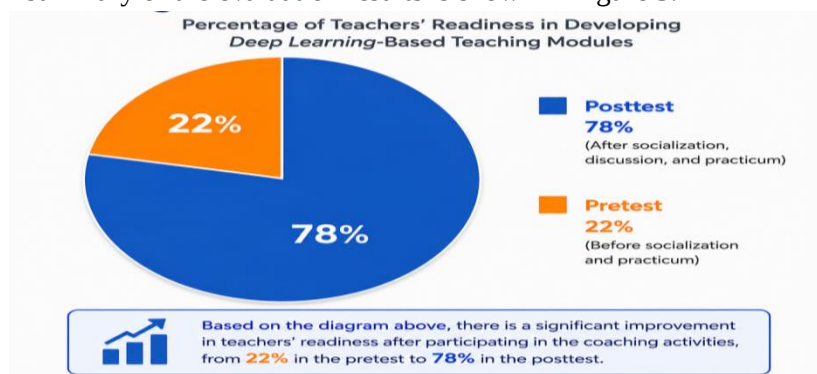


Fig. 3. Diagram of Pretest and Posttest Results

Based on the pretest and posttest results, teachers' competencies were significantly improved after participating in the entire training program. The average posttest score was higher than the pretest, indicating that the outreach, discussion, and practicum activities had a positive impact on improving teachers' competency in developing Deep Learning-based teaching modules. Reflection results also indicated that

teachers became more confident in designing teaching modules that integrate the principles of mindful, meaningful, and joyful learning, ready for implementation in the 2025/2026 academic year.

III. CONCLUSION AND SUGGESTIONS

Conclusion

Community service activities in the form of coaching for the preparation of Deep Learning-based teaching modules for teachers of SMP STMC 4245 Baleendah have been implemented according to the planned stages, including needs identification, socialization, discussion, practicum, evaluation, and reflection. The results of the activity show that coaching is able to improve teachers' understanding and skills in developing teaching modules that integrate the principles of mindful learning, meaningful learning, and joyful learning. This is evident from the high positive response of participants to the coaching activities and the improvement in evaluation results between the pretest and posttest. In addition, teachers have become more confident in designing teaching modules that are student-centered, contextual, and support the implementation of the Deep Learning approach in learning for the 2025/2026 academic year.

Recommendations

Similar coaching activities need to be implemented on an ongoing basis to ensure teachers' competency in developing learning tools continues to improve and keep pace with developments in education policy. Follow-up mentoring can focus on implementing Deep Learning-based teaching modules in the classroom, developing assessments aligned with deep learning principles, and developing digital technology-assisted learning tools. Furthermore, schools are expected to facilitate lesson study activities, teacher learning communities, or regular workshops as a forum for sharing good practices so that the quality of learning can be continuously improved.

IV. ACKNOWLEDGMENTS

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