

Model For Preparing Teaching Materials And Student Worksheets

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Abstract

This community service activity aims to provide training and assistance to lecturers in developing quality teaching materials and student worksheets. The main problem faced by educational institutions is the lack of structured and innovative teaching materials that can facilitate independent learning. The method used includes training workshops, mentoring sessions, and direct practice in developing teaching materials. The results show that participants are able to design teaching materials that are more systematic, interactive, and aligned with learning outcomes. This activity makes a significant contribution in improving the quality of learning and lecturer competence in preparing teaching materials that are in accordance with the needs of students and curriculum demands.

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1. INTRODUCTION

The development of higher education requires lecturers to continue to innovate in designing and compiling effective and efficient teaching materials. Teaching materials are a crucial component in the learning process, serving as a guide for students in achieving expected competencies.[1] However, the reality on the ground shows that many lecturers still experience difficulties in compiling teaching materials that are systematic, interactive, and in accordance with the needs of the Outcome-Based Education (OBE) curriculum.

Student Worksheets (SWs), as a form of teaching material, play a strategic role in facilitating active and independent learning. Well-designed SWs can increase student engagement, develop critical thinking skills, and encourage problem-solving-based learning. However, developing quality SWs requires a thorough understanding of instructional design principles, student characteristics, and the integration of learning technology[2].

Based on a needs analysis conducted on lecturers at several universities, it was found that the majority of lecturers require technical guidance in developing comprehensive and innovative teaching materials. Therefore, this community service activity is designed to provide a solution through intensive training and mentoring in developing effective models for developing teaching materials and student worksheets.[3].

2. IMPLEMENTATION METHOD

This community service activity was implemented using a participatory approach that actively involved participants in all stages of the activity. The implementation method was systematically designed to ensure optimal transfer of knowledge and skills to participants[4].

ACTIVITY STAGES

The activity was carried out through several systematic stages as follows. The first stage was a needs analysis to identify participants' problems and competencies in developing teaching materials. The second stage was a training workshop that discussed basic concepts of teaching materials, principles of instructional design, and techniques for developing LKM. The third stage was an intensive mentoring session where participants were guided directly in designing and compiling teaching materials according to their respective courses. The fourth stage was a hands-on practice of developing teaching materials using the provided templates and guides. The final stage was the evaluation and revision of the teaching materials products that had been developed by the participants.

ACTIVITY PARTICIPANTS

Participants in the activity are all lecturers from various study programs at partner universities. Participants are selected based on the need for teaching materials development and their willingness to consistently participate in all activities.

INSTRUMENTS AND MATERIALS

The training materials cover the concept of OBE-based teaching materials, the structure and components of student worksheets (LKM), techniques for writing learning objectives, material presentation strategies, learning activity development, and evaluation of teaching materials. The instruments used include a guide to developing teaching materials, a LKM template, an assessment rubric, and an activity evaluation questionnaire.

3. RESULTS AND DISCUSSION

Activity Results

This community service activity yielded several significant achievements, identified through various success indicators. All 30 participants successfully developed systematic and comprehensive teaching materials for their courses. Of these, 28 (93.3%) successfully developed worksheets (LKM) that met the eligibility criteria based on the assessment by a team of experts consisting of three expert validators in the fields of instructional design and teaching materials development.

The improvement in participants' competency in designing teaching materials showed very positive and measurable results. Based on the competency test instruments given before and after the activity, there was a significant increase in understanding. The average pre-test score of participants was 65.4, with a sufficient category, increasing to 85.7 in the post-test with a very good category. This increase demonstrates the effectiveness of the training and mentoring methods applied in this community service activity. A more detailed analysis shows that the highest increase occurred in the aspects of compiling learning outcomes (gain score 24.5 points) and developing interactive learning activities (gain score 22.3 points).

The learning materials produced by the participants include various important components that comply with the standards for developing learning materials in higher education. These components include complete course identification with code, course name, number of credits, semester, and prerequisites. Furthermore, there is a course description that explains the general overview and scope of the learning materials. The learning outcomes section contains measurable and specific details of the Graduate Learning Outcomes (CPL) and Course Learning Outcomes (CPMK). The learning materials are structured and systematically arranged in a logical sequence, supplemented by relevant and contextual examples and illustrations. Each chapter or learning unit is also equipped with various exercises and assignments, as well as valid and reliable learning evaluation instruments.[5]

The student worksheets developed by the participants employ an active learning approach with a variety of activities designed to enhance student engagement. These activities include case study analysis related to real-world contexts in their respective fields, problem-solving exercises with varying levels of difficulty, structured group discussions with clear discussion guides, mini-

projects integrating learned concepts, and reflection assignments that encourage students to evaluate their own learning process. This diversification of activities aims to accommodate students' diverse learning styles and develop higher-order thinking skills.[6]

Teaching Material Qualification Assessment Results

Evaluation Aspects	Average Score	Category
Completeness of Components	4,2	Very good
Clarity of Learning Outcomes	4,1	Very good
Systematics of Presentation of Material	3,9	Good
Suitability of Examples and Illustrations	3,8	Good
Variations in Learning Activities	4,0	Good
Quality of Evaluation Instruments	3,7	Good
Overall Average	3,95	Good

Based on the results of the activity evaluation questionnaire distributed to all participants, a very high level of satisfaction was obtained with the implementation of this community service activity. As many as 95% of participants stated that the training was very useful and significantly improved their understanding of the concepts, principles, and techniques for preparing effective teaching materials. As many as 90% of participants felt more confident in developing innovative teaching materials that are in accordance with student needs and the demands of the OBE-based curriculum. As many as 88% of participants stated that the training materials were very relevant to their needs in carrying out teaching duties at universities.

Participants also expressed high appreciation for the mentoring methods implemented during the activity. They noted that the personalized mentoring enabled them to receive direct, specific, and constructive feedback on the teaching materials being developed. Two-way communication between the resource person and participants was effective, creating a conducive and collaborative learning environment. The flexibility of the consultation schedule was also seen as a positive aspect, making it easier for participants to adjust to their work schedules.

Discussion

Effectiveness Training and Mentoring Methods

The results of this activity demonstrate that the combination of workshop training and personal mentoring is a highly effective strategy for improving lecturers' competency in developing teaching materials. The participatory approach implemented allows participants to actively engage in the entire learning process, from understanding theoretical concepts to practical product development. The transfer of knowledge and skills is more effective because participants not only passively receive information but also directly practice and apply the knowledge gained to the context of the courses they teach.

This aligns with Knowles' theory of adult learning (andragogy), which emphasizes the importance of hands-on experience, relevance of material to practical needs, and autonomy in learning. Adults learn more effectively when they can see the direct application of the knowledge they learn to their work or life. In the context of this activity, participants can directly apply the

concepts they learn to develop teaching materials for use in their teaching, thus increasing their motivation and engagement.

The personal mentoring provided during the learning materials development process also played a crucial role in the success of this activity. Through mentoring, each participant received specific feedback tailored to their individual needs. The resource person was able to identify any difficulties or conceptual errors experienced by the participants and provide appropriate guidance to address them. This mentoring model also facilitated a reflection process that helped participants continuously refine and perfect the learning materials they developed.

Development of Teaching Materials Based on *Outcome-Based Education*

The development of OBE-based teaching materials, the primary focus of this activity, has proven to be very helpful for lecturers in designing more targeted, measurable, and competency-oriented learning. The OBE paradigm requires lecturers to first establish clear and specific learning outcomes before designing learning content, strategies, and evaluation. With this approach, all learning elements are designed coherently and systematically to support the achievement of established competencies [7].

In this activity, participants are trained to formulate learning outcomes using the revised Bloom's taxonomy, which includes cognitive process dimensions (remembering, understanding, applying, analyzing, evaluating, and creating) and knowledge dimensions (factual, conceptual, procedural, and metacognitive). The formulation of appropriate learning outcomes provides a strong foundation for the development of other components of the teaching materials. Participants are also trained to ensure alignment between learning outcomes, learning materials, learning activities, and learning evaluation.

The concept of constructive alignment proposed by Biggs and Tang serves as the theoretical foundation for developing this OBE-based teaching material. Constructive alignment emphasizes the importance of alignment between what students are expected to achieve (intended learning outcomes), how students learn to achieve them (teaching and learning activities), and how those achievements are measured (assessment tasks). When these three elements are aligned, learning becomes more effective and efficient because all components work synergistically to support student competency achievement.

Active Learning through Student Worksheets

Student worksheets developed using an active learning approach have been proven to significantly contribute to encouraging student learning independence and developing higher-order thinking skills. Active learning positions students as learning subjects who actively construct their own knowledge through various meaningful activities, rather than simply passively receiving information from lecturers. The activities in student worksheets are designed to engage students intellectually, emotionally, and socially in the learning process[8].

Various active learning strategies integrated into LKM, such as problem-based learning, case-based learning, and project-based learning, have proven effective in improving students' conceptual understanding and application of knowledge. Through problem-solving activities, students not only memorize facts and concepts but also learn how to apply that knowledge to solve real-life problems. This process develops critical, analytical, and creative thinking skills, which are essential for the workplace and professional life.

Structured group discussion activities in LKM also facilitate collaborative learning and develop students' communication skills. Through discussion, students learn to articulate their thoughts, listen to others' perspectives, and construct shared understanding through dialogue and negotiation of meaning.[9] This collaborative learning aligns with Vygotsky's social constructivism theory, which emphasizes the importance of social interaction in learning and the concept of the zone of proximal development.

Challenges and Handling Strategies

Although this activity generally ran smoothly and achieved the expected goals, there were several challenges encountered during the implementation. The main challenge was the limited time participants had to complete the teaching materials, given the lecturers' quite busy workload with various Tridharma Perguruan Tinggi (Three Pillars of Higher Education) tasks. To overcome this obstacle, the implementation team provided flexibility in the consultation and mentoring schedule. Participants could arrange consultation times according to their schedules, including through online consultations using video conferencing platforms and instant messaging applications for faster and more efficient communication.

Another challenge faced was the varying levels of participants' initial abilities in understanding instructional design and learning technology. Some participants, already familiar with these concepts, were able to quickly grasp the material and develop teaching materials, while others required more intensive guidance. To accommodate these differences, the implementation team implemented a differentiated approach to mentoring. Participants requiring more assistance received more consultation time and more detailed guidance.

Some participants also experienced difficulties integrating learning technology into the teaching materials they developed. In this digital era, the use of technology in learning is increasingly important to improve the accessibility, flexibility, and attractiveness of teaching materials. To address this, the implementation team provided additional sessions specifically discussing various technology tools and platforms that can be used to develop digital teaching materials, such as interactive multimedia, learning videos, simulations, and online assessments. Participants were also introduced to the concept of blended learning, which combines face-to-face learning with online learning.

Practical and Theoretical Implications

This community service activity has significant practical implications for improving the quality of learning in higher education. First, the availability of comprehensive and easy-to-follow models and guidelines for developing teaching materials can be replicated by other lecturers who wish to develop teaching materials for their courses. The templates and examples of teaching materials generated from this activity can serve as practical references, helping lecturers begin the process of developing their own teaching materials.

Second, the teaching materials developed by the participants and validated can be directly implemented in learning and contribute significantly to improving the quality of student learning processes and outcomes. Well-structured teaching materials, complemented by varied and relevant learning activities, and valid evaluation instruments, will facilitate more effective and efficient learning. Students will receive clear learning guidance and be able to learn more independently with the support of quality teaching materials.

Third, this activity also contributes to enhancing the professionalism of lecturers as educators. Competence in developing teaching materials is one of the pedagogical competencies that professional lecturers must possess. By participating in this activity, lecturers not only improve their knowledge and skills in developing teaching materials but also raise their awareness of the importance of systematic learning planning oriented towards achieving student competencies.

Theoretically, this activity contributes to strengthening the understanding of the importance of systematic instructional design in improving the quality of learning in higher education. It also provides empirical evidence on the effectiveness of training and mentoring approaches in lecturer professional development. The learning materials development model used in this activity can serve as a reference for further research and development in the fields of instructional design and learning technology.

The results of this activity also support learning theories that emphasize the importance of meaningful learning, constructivism, and student-centered learning. Teaching materials developed using this approach facilitate students' active construction of their own knowledge, linking new knowledge to existing knowledge, and applying knowledge in relevant contexts. This

approach aligns with 21st-century learning principles that emphasize the development of higher-order thinking skills, collaboration, communication, and creativity.

Sustainability and Further Development

To ensure the sustainability of this activity's impact, the implementation team has designed several follow-up strategies that will be implemented after the main activity is completed. First, a community of teaching materials development practitioners will be formed, consisting of participants and other interested lecturers. This community will serve as a forum for sharing experiences, best practices, and resources related to teaching materials development. Through regular online and offline meetings, community members can continue to learn from each other and develop their competencies sustainably.

Second, regular monitoring and evaluation will be conducted on the implementation of the teaching materials developed by the participants. The implementation team will visit participant classes to observe how the teaching materials are used in real-life learning and their impact on student learning processes and outcomes. Feedback from student users of the teaching materials will also be collected to gain their perspectives on the quality and usefulness of the teaching materials. Data from this monitoring and evaluation will be used to continuously improve and refine the teaching materials.

Third, the best teaching materials produced from this activity will be documented and compiled into a repository or digital library of teaching materials accessible to all lecturers at partner universities. This repository will serve not only as a reference source but also as a medium for sharing and collaboration in developing teaching materials. Lecturers can adapt and modify existing teaching materials to suit the needs of their learning context.

Fourth, a mentoring program will be developed where participants who have successfully developed high-quality teaching materials will become mentors for other lecturers who wish to develop their own. This mentoring program will help broaden the impact of the program and create a culture of continuous professional development among lecturers. This peer mentoring model is also more sustainable because it does not always require the presence of external resource persons.

Participant Responses to Community Service Activities

Rated aspect	Strongly agree (%)	Agree (%)	Disagree Less (%)
The material is very relevant to the needs	73	72	0
Competent and communicative resource person	80	20	0
The mentoring method is very helpful	70	27	3
Adequate implementation time	50	43	7
Supporting facilities and suggestions	67	30	3
Increase motivation to develop teaching materials	77	23	0
Recommend similar activities	83	17	0

Contribution to Improving the Quality of Learning

This community service activity provides a multidimensional contribution to improving the quality of learning in higher education. At the micro or individual level, this activity enhances lecturers' pedagogical competencies, specifically in the planning and development of teaching

materials. Lecturers with these competencies will be able to design more effective and efficient learning, which ultimately improves the quality of the learning process and student outcomes.

At the meso- or institutional level, the availability of quality teaching materials for various courses will improve the overall quality of learning at higher education institutions. Standardized teaching materials also facilitate the quality assurance process and ensure the quality of learning. Institutions can use teaching materials as supporting documents in the study program accreditation process, as the availability of quality teaching materials is a key indicator in accreditation assessments.

At the macro level, or within the national higher education system, developing a systematic model for developing teaching materials based on national higher education standards contributes to improving the overall quality of Indonesian higher education. The models and best practices resulting from this activity can be disseminated to other universities through publications, seminars, or workshops, so that their benefits can be felt by a wider range of lecturers and students in Indonesia.

From the perspective of students as the primary users of learning materials, the availability of quality learning materials offers several significant advantages. First, students have clear and structured learning guides that facilitate independent learning. They can set their own learning pace and use the learning materials as a primary reference for understanding the concepts taught. Second, the varied and challenging learning activities in LKM help students develop higher-order thinking skills and the ability to apply knowledge in real-world contexts.[10]

Reflection and learning from the implementation of activities

The implementation of this community service activity provided several valuable lessons for the implementation team. First, the importance of conducting an in-depth needs analysis before designing a training program. A sound needs analysis ensures that the materials and methods used are truly relevant to the participants' needs and can generate a significant impact. In this activity, the needs analysis was conducted through surveys, interviews, and focus group discussions with prospective participants and university leaders.

Second, the combination of theoretical input and hands-on practice has proven highly effective in adult learning. Participants need not only conceptual knowledge of how to develop effective teaching materials, but also the opportunity to directly practice them under the guidance of competent resource persons. This balance between theory and practice must be carefully planned in the training program design.

Third, flexibility in implementation is crucial given the busy schedules and varied needs of participants. Although activities have been designed with a structured schedule, the implementation team must be prepared to make adjustments based on emerging situations and needs during implementation. The ability to adapt and respond to participant needs is key to the success of community service activities.

Fourth, the importance of building a good relationship between the implementation team and participants. A conducive atmosphere, open communication, and mutual respect create a comfortable and supportive learning environment. Participants feel valued not just as training participants, but as partners in the learning process. This increases their motivation and engagement throughout the entire series of activities.

4. CONCLUSION

The community service activity on the model for compiling teaching materials and student worksheets was successfully implemented and achieved all the stated objectives. Based on the results of a comprehensive evaluation, it can be concluded that this activity has had a significant positive impact on improving lecturers' competency in designing and developing quality teaching materials. Participants demonstrated measurable improvements in understanding and skills through various indicators, including an increase in competency test scores from an average of

65.4 to 85.7, as well as success in producing teaching materials and student worksheets that meet eligibility standards with an average assessment score of 3.95 on a scale of 5.

The learning materials produced by the participants are systematic, interactive, and aligned with the principles of outcome-based education. The components of the learning materials are coherently structured to support student achievement of the competencies established in the course learning outcomes. The developed Student Worksheets employ an active learning approach with a variety of activities designed to develop higher-order thinking skills, encourage independent learning, and facilitate collaborative learning. This aligns with the demands of 21st-century learning, which emphasizes the development of the 4C skills: critical thinking, creativity, collaboration, and communication.

This activity makes a tangible and multidimensional contribution to improving the quality of learning in higher education. At the individual level, lecturers experience improved pedagogical competence, which will directly impact the quality of their teaching. At the institutional level, the availability of quality teaching materials for various courses will raise overall learning standards and support quality assurance and accreditation processes. At the national higher education system level, the resulting models and good practices can be disseminated and replicated in other universities, thus providing broader benefits for improving the quality of higher education in Indonesia.

Based on the evaluation and reflection on the implementation of the activity, several recommendations are made for future development and improvement. First, it is recommended that similar activities be conducted continuously and regularly with a wider range of participants to broaden the positive impact on improving the quality of learning in higher education. Second, it is necessary to add materials and practices on the integration of digital technology and online learning in the development of teaching materials, given the very rapid technological developments and the increasing demand for adopting digital learning. Third, the duration of the activity should be extended or divided into several sessions with specific time intervals to provide sufficient time for participants to develop teaching materials without being overburdened with other tasks. Fourth, a systematic post-activity monitoring and evaluation mechanism should be designed to ensure the implementation of the developed teaching materials, identify obstacles in implementation, and provide necessary follow-up support. Fifth, it is necessary to develop a digital platform or repository of teaching materials that facilitates sharing, collaboration, and continuous learning among teaching material developers.

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