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MENTORING THE PREPARATION OF PROBLEM-BASED LEARNING-BASED E-MODULES AT MADRASAH IBTIDAIYAH MUHAMMADIYAH HADIMULYO

Sutrisni Andayani [1], Sudarman Dami[2], M. Ihsan Dacholfany[3], Marzuki Noor[4]

[1, 2, 3, 4]Universitas Muhammadiyah Metro, Lampung, Indonesia

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ABSTRACT

After the Covid-19 pandemic, Madrasah Ibtidaiyah (MI) Muhammadiyah Hadimulyo teachers used blended learning (online and offline). In online learning, teachers need teaching materials that can be delivered in a more practical, interesting and easier for students to understand the material, for example is modules, namely electronic modules. Teachers are not yet skilled in preparing e-modules, therefore the need for community service in the form of a workshop for preparing e-modules based on problem-based learning. The purpose of this service is to increase knowledge and skills in developing problem-based learning modul, the stages of this service include: preparation and socialization, workshops, assistance and evaluation. 1) preparation is carried out by preparing materials and materials for one subject matter and socialization is carried out by providing understanding and knowledge about e-modules, 2) workshops, by developing teacher skills and knowledge in making problem-based learning-based e-modules, the material is compiled in word form, moved to canva and then displayed in the form of flipblu or pdf and displayed via android and 3) the assistance stage by accompanying the teacher to complete the e-module, the evaluation is carried out to find out whether the activity has been successfully implemented. The results of the activity obtained that the partners felt interested, got new knowledge, had the knowledge and skills to make e-modules based on problem-based learning. The suggestion in this service is that the preparation of e-modules should vary.

Corresponding Author:

Sutrisni Andayani
Mathematics Education Study Program, Faculty of Teacher Training and Education
Universitas Muhammadiyah Metro
Jl. Ki Hajar Dewantara No.116, Metro City, Lampung.
Email: trisnimath.andy@gmail.com

INTRODUCTION

Madrasah Ibtidaiyah (MI) Muhammadiyah Hadimulyo is one of the Muhammadiyah schools in Metro City. During the Covid-19 pandemic, in addition to face-to-face learning, students learned more online. After the COVID-19 pandemic, teachers also adopted blended learning, which combines online and offline learning. In online learning, teachers and students

do not meet in person but communicate virtually through WhatsApp, Zoom/Google Meet, Android, or a Learning Management System (LMS).

A teacher in delivering learning materials online requires teaching materials that can be delivered more practically, are easy to use, attract students' attention, and make it easier for students to understand the material. Teaching materials are sources of information, tools, and texts used by teachers for planning and implementing learning (Nedyana, 2017). The teaching materials used can be in the form of modules, which are the most appropriate teaching materials as a learning resource in teaching and learning activities that can be studied independently by students. Modules are teaching materials that are planned and organized systematically, containing learning experiences so that students can achieve their learning objectives (Harahap & Fauzi, 2018). A module is a package containing a series of learning activities that are systematically organized to achieve students' learning objectives and can be studied independently.

Modules can be delivered directly through face-to-face learning and through e-learning. The importance of additional learning through e-learning to improve students' learning abilities during the current pandemic is a problem and challenge in the world of education (Sukarman et al., 2021). E-modules are one of the learning materials that use technology as an innovation (Irwansyah, et al., 2017). The materials and teaching resources available in the e-learning system can be in the form of multimedia or text-based e-modules, which make students more interested in learning and less bored with conventional teaching materials that are difficult to understand (Astalini et al., 2021). E-modules are print-free modules specifically designed for self-learning (Rezki et al., 2021). E-modules not only contain textual material or explanations but also audio, images, or videos that can be embedded to support concept mastery (Hastani et al., 2021).

Learning models can be used in e-modules, one of which is *Problem-Based Learning (PBL).* PBL is a student-centered learning method that emphasizes problem solving. In PBL, students are given complex and realistic problems that they must solve using the knowledge and skills they have learned (Anjarwati, 2019). The results of Andayani's (2022) study state that modules based on problem-based learning help students to learn independently and improve their mathematical problem-solving skills, and that students are interested and assisted in their learning. The use of PBL-based modules can improve students' learning outcomes and critical thinking skills (Rahmatika et al., 2020; Melyastiti et al., 2023). PBL encourages students to actively engage in learning through the identification and resolution of real-world problems, enabling them to learn independently and collaborate with peers (Rahmatika et al., 2020; Indrasari et al., 2023).

The steps in the problem-based learning model are: 1. Problem orientation, 2. Problem representation, 3. Experimental investigation, 4. Presentation, 5. Evaluation and follow-up (Jatmiko et al., 2018). The stages of PBL include: 1) orienting students to the problem, 2) organizing students, 3) guiding the investigation, 4) developing and presenting results, and 5) analyzing and evaluating the problem-solving process (Suparman et al., 2021). Based on the above opinions, the stages of *Problem Based Learning* are: presenting the problem, 2) describing the problem, 3) solving the problem, 4) presenting the results, and 5) concluding.

The use of PBL-based modules can enhance scientific argumentation skills through the process of analyzing problems (Nurinda et al., 2018). The use of problem-based modules can improve students' creative thinking skills (Anjarwati, 2019). The use of PBL-based e-modules can increase student motivation and learning outcomes (Tambunan et al. (2018), Agung & Sudatha, 2021). An analysis of the need for the development of PBL-based e-modules conducted by Andini et al. (2021) emphasizes the importance of developing teaching materials that are relevant to students' needs. Meanwhile, the use of PBL e-modules can improve critical thinking quality through valid and effective measurements based on the 4D model (Pujiono et al., 2024).

Many teachers at MI Muhammadiyah still do not use *problem-based learning* e-modules in their teaching. Some teachers still do not understand e-modules and are not skilled in making them. Therefore, workshops and assistance in the form of community service for teachers are needed to create problem-based learning e-modules. The aim of this community service is for

teachers to have the knowledge and skills to create problem-based learning e-modules so that the quality of learning can be improved.

Based on the above, the partners have the following issues: 1) lack of knowledge in creating problem-based learning e-modules, 2) lack of skills in creating problem-based learning e-modules. The objective of this community service is to enable the partners to acquire knowledge and skills in creating problem-based learning e-modules.

IMPLEMENTATION METHOD

This community service was carried out at MI Muhammadiyah Hadimulyo with subject teachers as the subjects. The service was conducted over a period of six months, starting from the proposal stage to the final report. The stages of this workshop on the development of problem-based learning e-modules included:

1. Preparation and socialization

   The preparation aimed to prepare materials for creating e-modules, namely materials, schedules, participants, and resource persons, while the partners prepared teaching materials and laptops/Android devices. The socialization aimed to provide understanding and knowledge about the creation of problem-based learning e-modules to the partners.
2. Workshop

   The workshop aims to develop teachers' skills and knowledge in creating e-modules based on problem-based learning.

   Activities conducted in this workshop include:

   a. Teachers write down the Basic Competencies, Competency Indicators, and Learning Objectives.
   b. Teachers create module materials in Word format for one main topic.
   c. Preparing tools for creating e-modules, such as laptops.
3. Training

   The training is conducted over 1 day, during which teachers are provided with an explanation of the module concepts, methods for creating modules that include Core Competencies, learning indicators, objectives, module creation guidelines, material descriptions, student worksheets, test questions, and answer keys in Word format. Steps in solving problems/example problems based on problem-based learning. Next, the module is created using the Canva application by adding images or cover layouts to the module to make it visually appealing. It is then formatted in a flipbook format, allowing it to be opened page by page and displayed on laptops/Android devices. Partners practice creating e-modules.
4. Assistance and evaluation stage

   Assistance is provided by helping teachers complete the e-module. Mentoring is conducted twice a week, guiding teachers in completing the e-modules. After completing one core subject, teachers proceed to the next core subject to ensure the e-modules are completed over several sessions. Evaluation is conducted to determine whether the activities have been successfully implemented. The results of these activities can be applied in both offline and online learning. Students can access them via smartphones and laptops/computers.

RESULTS AND DISCUSSION

A workshop on the development of e-modules based on problem-based learning was conducted through planning activities, workshops, and mentoring sessions for teachers at MI Muhammadiyah Hadimulyo. During the planning phase, coordination was carried out with the school principal regarding the community service activity in the form of a workshop on the development of e-modules based on problem-based learning, identifying participants, and determining the schedule for the community service activity. Planning took place on Thursday, May 31, 2023, to inform partner teachers about the importance of creating modules and e-modules based on problem-based learning and to prepare materials to be used in the activity. Documentation of the planning activity is presented in Figure 1.

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Figure 1. Coordination and planning activities with the school principal

Based on Figure 1, coordination is carried out by the devotee together with the principal to discuss the implementation of service activities, schedules, participants and others. At the planning stage, modules, e-module functions that can be used by students in online and offline learning are introduced. Furthermore, partner teachers are asked to prepare materials for making modules, namely subject matter for one subject and bring labtop/android as training materials.

The workshop was held on June 17, 2023, from 8:00 a.m. to 3:00 p.m. with 46 participants. The workshop began with an opening speech by the Principal of MI Muhammadiyah Hadimulyo. The presentation of materials included an explanation of module usage, steps in module development, the problem-based learning model, and the creation of e-modules using laptops/Android devices with the Canva application and Flip BluBlu interface, conducted by the facilitators together with the students.

Figure 2. Activity of presenting material for developing PBL-based e-modules.

Based on Figure 2, the module definition material covers the definition of modules, characteristics of modules, module contents, and benefits of modules. The material on the steps for developing partner modules covers the components of modules, explanations on how to develop modules, and module examples. Next, in the development of problem-based learning module materials, the steps of problem-based learning are provided, namely presenting the problem, 2) describing the problem, 3) solving the problem, 4) presenting the results, and 5) concluding. Partners are then asked to practice how to create a module using the materials that have been prepared beforehand, namely materials for one topic. Partners can complete the module by adding: 1) module usage instructions, 2) core competencies, basic competencies, competency achievement indicators, and learning objectives, 3) lesson materials and sub-materials using the problem-based learning steps, 4) practice questions, 5) summary, and 6)

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competency assessment. The materials created are then presented and supplemented with images using the Canva application as follows: 1) creating a Canva account, 2) selecting a design template, 3) adding design elements (images, icons, and fonts) as needed, 4) adding text (copying the material) using Canva's features, and 5) reviewing and exporting in PDF, PNG, Flipblublu, and other formats. The modules presented in flipblublu format are e-modules that can be viewed on computers/laptops/Android devices with a book-like interface that allows users to flip through pages one by one.

During the presentation of the material, the partner participants were enthusiastic in paying attention to the explanations. After the material was presented, there was a question and answer session about the material that was not understood and practicing how to compile an e-module. The partners asked how to combine Canva images with text and how to present the display as flipblu on Canva. The presenter explained that to combine images and text on Canva, one should first create a draft of the text and then copy it into Canva. The Canva layout can be chosen as flipbook or PDF. If the flipbook layout is selected, it will appear like a book being opened page by page. The presentation of the material on creating e-modules using Canva is shown in Figure 3, while the photo with the partners is presented in Figure 4.

Figure 3. Participants paying attention to the presentation of material

Figure 4. Group photo with partners.

Based on Figure 3 and 4, the activities conducted after the workshop were mentoring sessions held one week after the workshop, on June 24, 2022, and June 30, 2022. The mentoring was intended to provide guidance to partners who encountered difficulties in developing e-modules. During the development of e-modules, partner teachers were guided in creating content and sample questions based on problem-based learning steps, as well as completing the modules with practice questions and summaries. Partners were encouraged to be more creative in developing e-modules. Those who have completed a module for one core subject are encouraged to add content by incorporating other core subjects. Partners are provided with guidance on how to transfer modules into e-module format using the Canva application, starting with: 1) logging in to Canva, 2) selecting a design template, 3) adding design elements (images,

icons, and fonts) as needed, 4) adding text (copying the material) using Canva's features, and 5) reviewing and exporting in PDF, PNG, Flipblublu, and other formats. Transferring the created modules to the Canva application, adding images until saving the results in flipblublu format, and writing the link to the e-module. Documentation of the mentoring activities can be seen in Figure 5 below.

Figure 5. Assistance in creating e-modules

Based on Figure 5, after the workshop and mentoring activities were completed, an evaluation was conducted. Partners were given a questionnaire about their interest in participating in the activities. Based on the questionnaire results, the following information was obtained: 1) the workshop was easy to understand and interesting, 2) it increased knowledge and skills, 2) this training was different from previous training in that it involved creating modules in the form of e-modules using the Canva and Flipblublu applications, 3) The benefits obtained were: a) increased knowledge and skills in creating e-modules based on problem-based learning, b) proficiency in creating modules/images using Canva, and c) the ability to display e-modules in flipblublu format, which resembles a book that can be flipped through page by page.

An example of an e-module created by a teacher, in the form of an Islamic Education e-module, is presented in Figure 6 below:

Figure 6 Cover and E-module Content

The results of the mentoring program for the development of e-modules based on problem-based learning can enhance the interest and skills of partner teachers. E-modules based on Flipbook Maker are suitable for use (Mukramah et al., 2019). Additionally, these e-modules are valid in terms of content, instructional design, visual communication, and software utilization, and students responded very positively to their use (Linda et al., 2018). The PBL-based e-module can enhance students' problem-solving skills and critical thinking (Ahdhianto et al., 2024). Furthermore, Qadariah (2022) reported that the development of PBL-based modules has high validity, practicality, and effectiveness in improving learning outcomes. Ramadhany and Erlina (2020), who developed a social arithmetic e-module, showed that PBL-based e-modules are effective for students with high mathematical ability, while Qonitah and Hakim (2024) developed a valid and practical PBL-based e-module through the ADDIE model development stages.

Teachers can understand and apply PBL principles in every stage of e-module development, from analyzing student needs to evaluation, so that the modules are effective in the learning process (Sugiarto et al., 2023). During training activities, teachers can use PBL to reflect on their knowledge, concepts, understanding of the material, and pedagogical approaches before teaching through authentic problem-solving (Martin & Jamieson-Proctor, 2022). This training activity is expected to address challenges in education, particularly in delivering learning materials, engaging students, and creating dynamic interactions between students and instructional materials through the use of PBL-based e-modules (Demokratis et al., 2021; Melyastiti et al., 2023).

CONCLUSIONS AND SUGGESTIONS

Conclusion of the mentoring program for the development of problem-based learning e-modules at MI Muhammadiyah Hadimulyo: Through this community service activity, partner teachers have gained knowledge and skills in creating problem-based learning modules that can be utilized in teaching.

Suggestions for this community service include diversifying the use of images created with Canva in module development, expanding the content, and providing additional training to support future learning.

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REFERENCES

Agung, A. & Sudatha, I. W. (2021). Efektivitas Penggunaan E-Modul PBL terhadap Hasil Belajar Siswa. *Jurnal Inovasi Pendidikan*, 18(2), 145-156.

Ahdhianto, E., Mas'ula, S., Thohir, M., & Khotimah, K. (2024). Pengembangan E-Modul Berbasis PBL untuk Meningkatkan Keterampilan Pemecahan Masalah dan Berpikir Kritis Siswa Sekolah Dasar. *Jurnal Math Educator Nusantara Wahana Publikasi Karya Tulis Ilmiah Di Bidang Pendidikan Matematika,* 10(1), 167-178. https://doi.org/10.29407/jmen.v10i1.22376

Andayani, S. & Pratama, Y. (2022), Pengembangan Modul Matematika Dasar Berbasis Problem Based Learning untuk Meningkatkan Kemampuan Pemecahan Masalah, *AKSIOMA: Jurnal Program Studi Pendidikan Matematika,* 11(1), 121-131, DOI: https://doi.org/10.24127/ajpm.v11i1.4806

Andini, M., Syamsuri, S., Nindiasari, H., & Novaliyosi, N. (2021). Analisis Kebutuhan Pengembangan E-Modul Berbasis Problem Based Learning pada Materi Peluang. *Tirtamath: Jurnal Penelitian Dan Pengajaran Matematika*, 3(2), 116. https://doi.org/10.48181/tirtamath.v3i2.12733

Anjarwati, P.G.P., Sajidan & Prayitno, B.A. (2018), Problem-Based Learning Module of Environmental Changes to Enhance Students' Creative Thinking Skill, *Biosaintifika: Journal of Biology & Biology Education,* 10(2) 313-319, DOI: http://dx.doi.org/10.15294/biosaintifika.v10i2.12598.

Astalini, Darmaji, Kurniawan, D.A., Wulandari, W. (2021). Male or Female, who is better? Students' Perceptions of Mathematics Physics E-Module Based on Gender, *Indonesian Journal on Learning and Advanced Education (IJOLAE), 3(3), 207-224*

Demokratis, D., Yilmaz, R. M., & Deren, O. (2021). Konteks Pembelajaran Berbasis Proyek: Membangun Interaksi Dinamis Antara Siswa dan Materi Ajar, *Journal of Educational Research and Practice*, 11(2), 77-92.

Harahap, M. & Fauzi, R. (2017), Pengembangan Modul Pembelajaran Matematika Berbasis Web, *Jurnal Education And Development*, 4(5), 13-17, DOI**:** https://doi.org/10.37081/ed.v4i5.153

Hastani, F.S., Sudarmin & Pancawardhan, H. (2021). The Critical Problem Solving (CPS) E-Module Development on Ethnoscience-Integrated Thermochemistry Topics, *International Journal of Active Learning*, 6(2), 91-99.

Indrasari, R., Yuliani, A., & Perdana, F. (2023). Kolaborasi dalam Pembelajaran Berbasis Masalah: Pengaruh terhadap Keterampilan Sosial Siswa*. Jurnal Penelitian Pendidikan*, 9(3), 50-58.

Irwansyah. FS., Lubab. I., Farida, I. & Ramdhani, M A (2017), Designing Interactive Electronic Module in Chemistry Lessons, *International Conference on Mathematics and Science Education (ICMScE) IOP Conf. Series: Journal of Physics: Conf. Series 895, 1-7*

Jatmiko, Prahani, B.K., Munasir, Z. A., Supardi, I., Wicaksono, I, Erlina, N., Pandiangan, N., Althaf & Zainuddin (2018), The Comparison of ORIPA Teaching Model and Problem Based Learning Model Effectiveness to Improve Critical Thinking Skills of Pre-Service Physics Teachers, *Journal of Baltic Science Education*, 17(2) , 300-319

Linda, R., Herdini, Sulistya, E. & Putra, T.P. (2018), Interactive E-Module Development through Chemistry Magazine on Kvisoft Flipbook Maker Application for Chemistry Learning in Second Semester at Second Grade Senior High School, *Journal of Science Learning*, 2(1).21-25, DOI: 10.17509/jsl.v2i1.12933

Martin, F., & Jamieson-Proctor, R. (2022), Refleksi dalam Pembelajaran Berbasis Proyek: Mengembangkan Pemahaman Konsep dan Pedagogis Melalui Pemecahan Masalah. *International Journal of Education and Teaching*, 4(3), 321-335

Melyastiti, N., Agung, A., & Sudarma, I. (2023). E-modul berbasis problem based learning pada mata pelajaran matematika di sekolah dasar. *Jurnal Imiah Pendidikan Dan Pembelajaran*, 7(1), 82-92. https://doi.org/10.23887/jipp.v7i1.58538

Mukramah, W.A., Jannah, M. & Wahid, M.A. (2019), E-Modul Termodinamika Berbasis Flipbook Maker *Jurnal Phi: Jurnal Pendidikan Fisika dan Fisika Terapan*, 5(2), 54-59, DOI: https://doi.org/10.22373/p-jpft.v5i2.7752

Nedyana, A. (2017) Pengembangan Buku Ajar Biologi Berbasis Project Based Learning Untuk Meningkatkan Kreativitas Siswa SMA Negeri 1 Penengahan, Lampung Selatan *BIOEDUKASI: Jurnal Pendidikan Biologi, Universitas Muhammadiyah Metro*, 8(1), 16-25.

Nurinda, S., Sajidan & Prayitno, B.A. (2018), Effectiveness of Problem-Based Learning Module as An Instructional Tool in Improving Scientific Argumentation Skill, *Biosaintifika: Journal of Biology & Biology Education,* 10(2) 334-340, DOI: http://dx.doi.org/10.15294/biosaintifika.v10i2.12600

Pujiono, P., Sutiarso, S., & Dahlan, S. (2024). Pengembangan Pembelajaran Menggunakan E-Modul Problem Based Learning untuk Meningkatkan Kemampuan Berpikir Kritis Peserta Didik. *Aksioma Jurnal Program Studi Pendidikan Matematika,* 13(2), 567-576, . https://doi.org/10.24127/ajpm.v13i2.8811

Qadariah, N. (2022). Pengembangan Modul Evolusi Berbasis Problem Based Learning (PBL) untuk Meningkatkan Hasil Belajar Kognitif Mahasiswa di Jurusan Biologi Institut Agama Islam Negeri Kerinci. *Symbiotic Journal of Biological Education and Science*, 3(1), 39-49. https://doi.org/10.32939/symbiotic.v3i1.55

Qonitah, N. & Hakim, L. (2024). Pengembangan E-Modul Berbasis Problem Based Learning pada Mata Pelajaran Akuntansi Perbankan Syariah Kelas XI Layanan Perbankan Syariah Di SMK. *Edunomia: Jurnal Ilmiah Pendidikan Ekonomi*, 4(2), 148-156. https://doi.org/10.24127/edunomia.v4i2.4939

Rahmatika, N., Saputra, R. A., & Sari, D. (2020). Pengaruh Pembelajaran Berbasis Masalah terhadap Hasil Belajar dan Keterampilan Berpikir Kritis Siswa*. Jurnal Pendidikan dan Pembelajaran,* 7(1), 12-20.

Ramadhany, A. & Erlina, E. (2020). Pengembangan Modul Aritmerika Sosial Berbasis Problem Based Learning untuk Siswa SMP. *Jurnal Cendekia Jurnal Pendidikan Matematika*, 4(1), 212-226. https://doi.org/10.31004/cendekia.v4i1.155

Rezki, I.K., Karnando, J. &,Tasrif, E. (2021), Efektivitas E-Modul Berbasis Project Based Learning Selama Pembelajaran Jarak Jauh*, Jurnal Vokasi Informatika (JAVIT*), 1(1) 1 – 5, DOI: https://doi.org/10.24036/javit.v2i1

Setiawan, N. (2022), Pengembangan Modul Pada Mata Pelajaran Produk Kreatif dan Kewirausahaan Untuk Siswa Kompetensi Keahlian Teknik Kendaraan Ringan Otomotif SMK N 2 Pengasih, *Jurnal Pendidikan Vokasi Otomotif*, 3(1), 95-107.

Sugiarto, N., Prabowo, E., & Amin, M. (2023). Implementasi Prinsip-Prinsip Pembelajaran Berbasis Proyek (PBL) dalam Pembuatan E-Modul untuk Meningkatkan Hasil Belajar Siswa, *Jurnal Pendidikan dan Teknologi Pendidikan*, 12(1), 45-59..

Sukarman, Rahayu, W., Hakim, L.E., 2021. The Effectiveness of Mathematics E-Modules with a Contextual Approach on Geometry Matters to Improving Students' Learning Outcomes, *JURNAL Pendidikan Indonesia (JPI), 10(2), 362-369.*

Suparman, Juandi, D. & Tamur, M. (2021), Problem-Based Learning for Mathematical Critical Thinking Skills: A Meta-Analysis, *Journal of Hunan University (Natural Sciences),* 8(2), 133-144

Tambunan, R., Karmila, R., & Mediaty, N. (2018). Penerapan E-Modul Berbasis PBL dalam Meningkatkan Motivasi dan Hasil Belajar Siswa. *Jurnal Pendidikan dan Pembelajaran*, 25(3), 423-430.