
ABDIMAS

Jurnal Pengabdian kepada Masyarakat
<https://journal.unnes.ac.id/nju/index.php/abdimas/>

Environmentally Oriented Chemistry Practical Worksheets to Improve Conservation Character and Environmental Literacy

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Abstract

Management of chemistry practicum implementation has become a problem center that must be faced. This is caused by limited equipment and materials available in the laboratory, shortage of laboratory personnel, as well as its high costs required to carry out the practicum. Apart from that, chemistry practicum requires a high level of creativity from Chemistry teachers, well when they have to organize practicums independently and in classical learning for students. Therefore, guidance and mentoring from the service team is very important to help Chemistry teachers in developing their learning materials. This assistance takes place from June 22 to August 16 2022, starting with coordination between chairman of the MA Chemistry MGMP with the UNNES service team. The aim of the Community Service Program (PPM) is to build conservation character and environmental literacy among Chemistry teachers, also involving students, and of course MA students in Semarang. To date, there have been 2 environmentally oriented Chemistry Practical Worksheets created successfully, which is the result collaboration between one teacher and one student. At the end of August, we will proceed with further implementation steps. Results from this service activity will be published in a national journal accredited SINTA 3-6. The process of writing the publication is ongoing, as are the manuscripts that will be published through mass media. Devotion team firmly underlines the cultural importance of implementing environmentally oriented Chemistry Practical Worksheets that use the potential of natural materials available around the home.

Keywords: Implementation; Chemistry Practical Worksheet (LKPPD); Conservation character; Environmental literacy

INTRODUCTION

Analysis of the situation at Madrasah Aliyah (MA) in the city shows that learning there is generally similar to general high schools, with an emphasis on subjects. religion subject. However, Chemistry teachers in MA face a number of problems that need to be addressed. They need strategies that can facilitate the implementation of practicums, both in the COVID-19 pandemic situation and before, because chemistry practicums in MA are often not optimal. Chemistry practicum at Madrasah Aliyah (MA) is often not optimal¹. Because limited access to required laboratory equipment and materials. Usually, just there are several practicums scheduled each semester, and teachers who must prepare everything yourself. At first glance, learning at MA and general high school is similar, this is in accordance with Decree of the Minister of Religion Number 184 of 2019² regulates the Madrasah Aliyah Curriculum which includes subjects general subjects such as Indonesian, English, Mathematics, Physics, Chemistry, Biology, Indonesian History, Sociology, and Geography, as well as Arabic and Islamic Religious Education. However, in MA, portion eye Religious lessons are bigger and more prolonged. In contrast, in high school, there is more focus on the eyes general subjects such as Science and Mathematics. In MA, eyes Religion lessons are often taught several times a week

and cover a variety of subjects, such as Fiqh, Tajweed, and the Koran.

larger portion of the curriculum focused on religious instruction is what parents prefer. Some parents may feel worried that their children would lagging behind in general studies. Monitoring results in high school favorite in Semarang and the surrounding area, even outside the province of Central Java, shows a very worrying situation in the implementation of chemistry practicum. Based on the results interviews with students of the Chemistry or Chemistry Education study program from various regions, some only underwent chemistry practicum twice, and they even had forget the purpose of carrying out the practicum. Practicum is a capable learning strategy attract students' interest in developing concepts, because through practicum, students can directly observe phenomenon, which increases understanding of the concepts being taught³. Practicum implementation requires facilities good infrastructure, one of which is mandatory practical guidance well⁴based.

It is necessary to prepare a valid LKPPD to enable online implementation⁵. Stages of taking, collecting and analyzing result data from experiments⁶. Most of the other Madrasah Aliyah (MA) practicum activities in the Semarang area and surrounding areas have a similar pattern. However, there are two state high schools (SMA) in Semarang that are capable organize until eight eye Practical lessons for class X to XII students. This success can be considered an extraordinary achievement that is superior compared to other⁷institutions. Many practicum guide developments have also been carried out, such as research conducted by Nuswawati et al., (2020), namely the development of environmentally based chemistry practicum guides on acid-base material. Important for apply character values in every stage of the learning process⁸, because this can help shape students' positive and moral character, which is an important aspect of their personal development and social life. On this occasion I would like to assess the character of conservation and environmental literacy.

Implementation of practical instructions which include LKPPD. Implementation of the practicum guide which includes various LKPPD aims to strengthen character aspects in terms of conservation and environmental literacy. In 2020, during the pandemic, an inquiry-based practicum guidebook guided with an emphasis on character has been prepared by Risqi et al. (2022)⁹. During the practicum implementation in accordance with the LKPPD before, during and after assisted by students and staff education from the UNNES chemistry laboratory to prepare tools and materials, so that the recording process to make videos also works fluent. The structure of the LKPPD is illustrated in the context of a chemistry teacher as an example, while permitted For subtract, add, modify, or adapt according to the needs. Some LKPPD can be applied by several groups. Implementation of practical instructions includes steps such as making a video of practical implementation. The importance of strengthening the chemistry MGMP group at Madrasah Aliyah (MA) and other groups in implementing practicums needs to be emphasized. Practicum implementation in one semester requires a minimum of one eye practical lessons, even though the level the difficulty may be modest, this is still considered a tremendous effort. Because MA doesn't have the power laboratory assistant, so far the teacher is in charge answer For prepare practical requirements.

Teachers have a very important task in providing ongoing support to students, so that students can continue motivate yourself to study diligently and participate actively in the entire learning process¹⁰. Teachers have a role major in preparation tools and materials needed for each chemistry practicum executed. The process of carrying out practicums, especially in the eye lesson chemistry, has extraordinarily important³relevance. Practicum is not just a practice routine, but rather an essential process in proof as well as a deep understanding of the chemical concepts taught. Making LKPPD by the teacher, with guidance from service team, includes the inclusion of a comprehensive theoretical basis, well-defined objectives, as well as clearly detailed steps. By carrying out practicum according to these guidelines, it is hoped that the development of aspects of students' knowledge, attitudes and skills can experience significant improvements.

METHOD

The implementation plan for this service activity has been completed well detailed in a series of systematic stages. For further information regarding the steps to be taken carried out,

please refer to figure 1 provided.

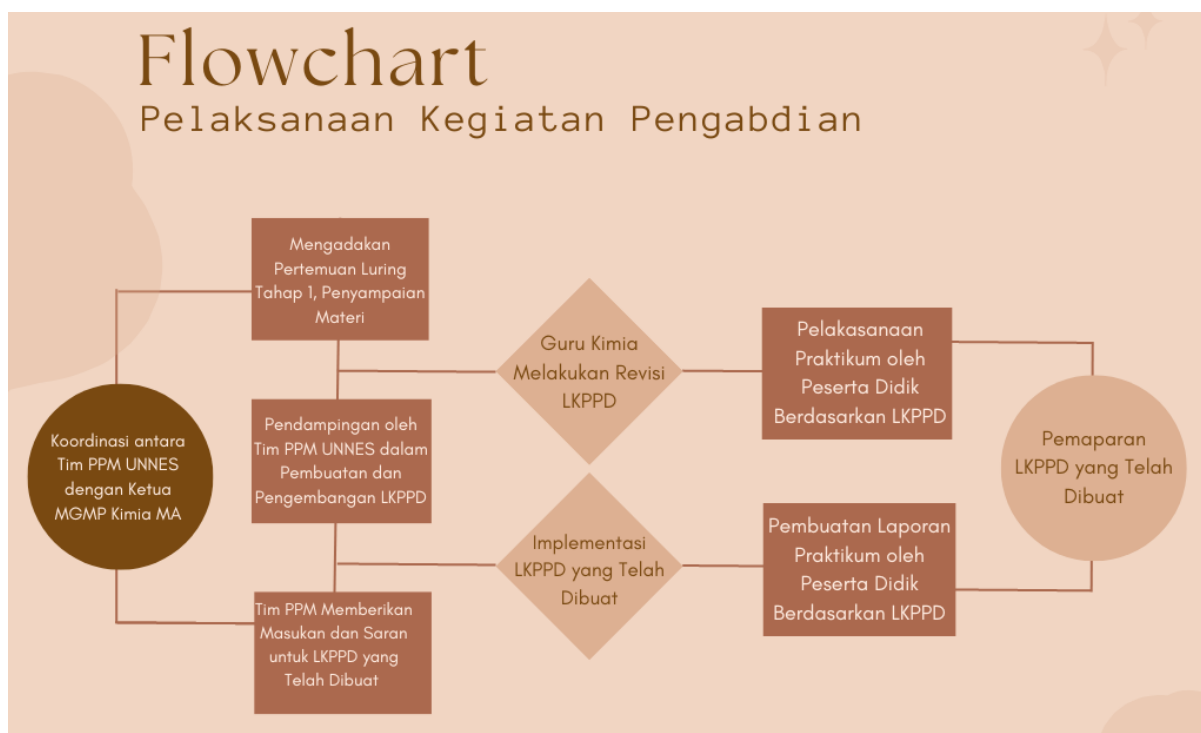


Figure 1. Flowchart of Implementation of Community Service Activities

The method of implementing this service aims to improve the implementation of chemistry practicum in senior high schools (MA) in Semarang City during the COVID-19 pandemic. The following are the steps that will be taken in this effort :

1. initial planning stage , close coordination was carried out between team servants , partners and students with the aim of implementing the Chemistry Practical Learning Activity Steps (LKPPD) effectively. This effort begins by clearly identifying the teaching material that will be taught and determining practicum courses that are in accordance with the applicable curriculum. Apart from that, in planning it is also important to formulate the LKPPD structure that will be used and consider the desired character values for instilled in students in the practical learning process. With this careful planning, it is hoped that the implementation of chemistry practicum at MA Semarang City in the era of the COVID-19 pandemic can be successful and beneficial .
2. an important process in this service, namely the creation of carefully planned practicum materials. Here , the preparation is carried out practicum agenda which will be an integral part of the Chemistry Practical Learning Activity Steps (LKPPD). Apart from that, special attention is given to improving the character of responsibility, both on the part of teachers and students, so that the practical implementation can run smoothly . dedication and involvement . During the process of creating this practicum material, we also paid great attention to ensuring that all the elements prepared were in accordance with the applicable curriculum, so that the results could provide maximum contribution to education at MA Semarang City in the midst of this challenging COVID-19 pandemic .
3. In the third stage, we pursue increasing environmental literacy as an important aspect of this service. This initiative includes efforts invites teachers and students to effectively utilize the potential of natural materials as well tools and materials available around their home environment. The purpose of this action is for encourage and increase awareness as well concern for environmental issues which are currently increasingly urgent . By providing access and understanding of how to use natural resources in the surrounding environment to support the implementation of chemistry practicum , it is hoped that this will create closer relationships between learning and nature, as well as a higher awareness of the importance of preserving the environment.

4. In the fourth stage, a special training program is aimed at teachers who have commitment to develop Chemistry Practical Learning Activity Steps (LKPPD) that suit the specific needs of the school. In this training, 15 participants out of a total of 18 were expected to have participated attend enthusiastically and actively participate in a series of activities . Their enthusiastic support in this training provides positive encouragement , indicating their desire to improve their abilities and competencies in designing quality LKPPD . This reflects Our commitment is to ensure that the chemistry practicum learning approach in high schools in Semarang City during the COVID-19 pandemic can be improved sustainably.
5. In step these five , partners play a very significant role in supporting the smooth implementation of community service programs . Our partners contribute by providing various laboratory equipment and materials needed in the chemistry practicum process . Apart from that, they are also responsible responsible for providing a place for carrying out activities, which includes the facilities needed for accompaniment as well as preparation of the participants who will be involved in the program. These facilities are very important to support the efficiency and effectiveness of the entire series of community services and roles partners in providing it hold key role in achieving program success .
6. In step sixth , the implementation of service activities becomes a moment crucial in realizing the goals of this program. Starting with remarks and delivery of material by the service team , this event was well guided by the moderator, namely Mrs. Sri Kadarwati . The series of material presented includes interesting topics such as "Chemistry is Fun," the use of information technology in developing interactive Chemistry Practical Learning Activity Steps (LKPPD) , as well as effective techniques in designing relevant LKPPD. Participants' activeness is reflected in their interactions throughout the session ask answer that _ enthusiastic , demonstrating their commitment to taking full advantage from this training. Implementation of this step is an important milestone in carrying out this service mission successfully .
7. In the seventh stage , our focus is on evaluation and information dissemination . This evaluation is reflected in the realization of the practicum manual that has been completed repaired , as a result from collaborative efforts in designing Chemistry Practical Learning Activity Steps (LKPPD). The video production process for practicum implementation is still in the creation stage, which will be a valuable resource For document effective chemistry practicum . Apart from that, we are also working on it publication the results of this program through national journals accredited SINTA 3-6 and mass media . Evaluation is carried out by referring to the development of the LKPPD that has been carried out refurbished , increased conservation character, as well environmental literacy, so that we can continue to measure the positive impact of our efforts to improve chemistry practicum in high school environments in Semarang City.



Figure 2. Opening of Dedication



Figure 3. Singing Indonesia Raya



Figure 4. Welcome speech



Figure 5. Presentation of Service Material



Figure 6. Question and Answer Session with Speakers



Figure 7. Group Photo and Closing Service

RESULTS AND DISCUSSION

Activity Results

Government Regulation Number 30 of 1990, article 43 paragraph 1, states firmly that universities have clear authority to carry out community service through various entities, including community service institutions, research centers, departments, laboratories, groups, and even by the individuals involved. This emphasizes the diversity of ways in which community service can be carried out, covering various scales and forms of collaboration with different "communities". However, until now, the contribution of universities in community service has not yet fully realize its important role in development, implementation and utilization results education and research produced¹². Therefore, we provide community service in the form of various programs and initiatives covering aspects such as education, training, research and application of the knowledge that has been generated. We carry out these various activities through various entities that have recognized by regulations, including community service institutions, research centers, departments, laboratories, groups, and even through the participation of individuals who are actively involved in providing significant benefits to society.

Community service is an initiative carried out by universities as a part from the implementation of the Tri Dharma of Higher Education. The aim is to provide assistance to the community in overcoming various problems, with the ultimate goal creating conditions for a prosperous society. Apart from that, community service is also considered a form of in-depth learning process about social life. Even in the context of a pandemic, community service programs must continue, even if it is done online as a response on changes from offline activities. However, amidst the challenges of the pandemic, it is important to confront radical views and intolerant attitudes with a moderate and inclusive approach¹³. Our main goal is to bridge gap between the academic world and society, so The results of existing research and knowledge can be applied more widely and be useful for society wide.

Community service activities carried out by lecturers have been walk according to the plan that has been made set. The main purpose The purpose of this service is to assist teachers in developing Chemistry Practical Learning Activity Steps (LKPPD) by going through several stages of mentoring before successfully creating quality LKPPD. In this training, we were successful gathered 15 participants from a total of 18 participants who were expected to attend. The presence of such participants enthusiasm is clear evidence of their enthusiasm in exploring knowledge about LKPPD. With results that reach the target, we has succeed saw two successful LKPPD developed as a result from this devotion. However, of the total number of participants, only four teachers who are able to develop LKPPD according to the special needs of each school.

The role played by partners in carrying out this service activity is to provide the equipment and materials needed to carry out the eye Practical lessons that must be carried out in the laboratory. What's more, currently the senior high school (MA) is a partner have demonstrated a clear need for support in efforts to increase the quality and number of chemistry practicum implementation in their schools. The importance of practicum in the teaching and learning process has been well understood, where this process is basically a communication activity between teachers and students. Therefore, in this education, it is important to confess the role of media as a tool aids called learning media¹⁴, which can support effective communication and deep understanding in learning. According to Singh (2017) media is an instrument or device that acts as an intermediary in delivering lesson material from teachers to students¹⁵. Meanwhile,

according to Nurita (2018), learning media are tools that support the teaching and learning process, clarify the message conveyed, and enable the achievement of learning goals effectively and efficiently. Learning outcomes reflect changes in students' knowledge, attitudes and skills after participating in learning. Learning media acts as an additional resource for students to receive information from teachers and improve their understanding and knowledge¹⁶. Referring to several previous definitions of learning media, it can be concluded that learning media is a tool or device that functions as an intermediary in the process of delivering lesson material from teacher to student. The goal is to clarify the message conveyed, so Achieving learning objectives can be done in an effective and efficient manner. The results of this learning process are reflected in changes in behavior students' behavior, knowledge, attitudes and skills after they have participated in learning. Learning media acts as an additional learning resource that helps students understand and improve their knowledge through information conveyed by the teacher.

Certainly smooth implementation of the program, agreed For start by preparing the Chemistry Practical Learning Activity Steps (LKPPD) as an initial stage. This LKPPD is prepared based on a service scheme that focuses on innovation in chemistry learning, while also including aspects of cultivating conservation character. The selection of roles and tasks is carried out by considering the expertise and qualifications of each team member. Partners who play an important role in providing a place for implementation, preparing audience who are mentoring participants, as well provide the necessary facilities during the community service program. Mentoring activities are carried out selectively in each location partners, with implementation time and materials provided previously arranged. All these steps are taken in part from careful planning to ensure the success and positive impact of this service program.

The first phase of the Community Service Program (PPM) began with a speech delivered by the Chair of the MGMP Chemistry MA Semarang City. After the speech, the series of events continued with the session delivery of material guided by the PPM team. The facilitator in guiding this activity was Mrs. Sri Kadarwati, who acted as moderator. In session delivering the material, the first material was given by Mr. Eko Budi Susatyo, who discussed the interesting topic of "Chemistry is Fun." Next, the second material was delivered by Mr Harjito, who focuses on the use of information technology (IT) in developing interactive Chemistry Practical Learning Activity Steps (LKPPD). The final session in this event included material presented by the mother Murbangun Nuswowati, who discussed LKPPD development techniques. After session delivery of material, followed by a session ask answer, where participants actively participate and show high enthusiasm, especially in responding to the material presented on "Chemistry is Fun."

Currently, a practical manual has been formed which contains various steps for Chemistry Practical Learning Activities (LKPPD). repaired. This book is the result of collaboration between teachers and students who have compiled and is in progress for submitted to the publisher. Apart from that, the process of making a video depicting the practicum implementation is still ongoing. In the context of the expected results from this service activity, we are committed For publish The output of this program is through publications in national journals accredited with a SINTA rating of 3 to 6. However, currently the publication is still Waiting for the deployment stage. Additionally, the script publication to be disseminated through mass media is also still in the development stage.

We want to emphasize the importance of implementing LKPPD which utilizes natural resources around the home environment, and we support businesses For preserve it. Teachers are given freedom to integrate the character of conservation and environmental literacy into certain material components. Even though the implementation of LKPPD faces time constraints, we continue by providing questionnaires and quizzes to teachers and students as part of from the evaluation process. Success from This assistance is evaluated based on the results of the development of LKPPD by each teacher, as well as increases in conservation character values and environmental literacy that can be measured.

The following is a table of results that have been achieved in community service activities that have been carried out:

Table 1. Achievement Results from Community Service

Outer	Achievement Year Target	Status	Real Achievements
Practical Manual with LKPPD	2022	Instructions are complete	Practical Instructions along with LKPPD have been recorded and are in the process of being submitted to the publisher
Practical Implementation Video	2023	In the manufacturing stage	The Practical Implementation Video is still in the development process.
Publication in mass media	2023	Has been published on YouTube	Publication has been carried out via YouTube.

CONCLUSION

Through reviewing the discussion above, there are a number of them conclusions that can be explained as follows:

1. The result of this series of activities is the formation of Chemistry Practical Learning Activity Steps (LKPPD) which are interesting and in accordance with the preferences of each teacher, although not all participants have succeeded in designing a complete LKPPD. according to the specific needs of each school.
2. community service plays a role in strengthening the conservation character of teachers, students and pupils at MA. This service also fosters a sense of teacher responsibility towards students in delivering learning in accordance with the applicable curriculum.
3. community service efforts that have been carried out have had a positive impact in increasing levels environmental literacy among teachers, students and pupils. They are invited to utilize natural materials, tools and resources in the environment around the house as valuable learning resources.

Through the results obtained from the implementation of this activity, it can be concluded that community service has a significant impact on character development, increased understanding, and wiser use of natural resources within the educational community.

REFERENCES

- Anggraini, T., Nurhamidah, N., & Rohiat, S. (2022). Analysis of the Relationship between Practicum Implementation and Chemistry Learning Outcomes for Public High School Students in Bengkulu City. *Allotropes*, 6(1), 28-34.
- Decree of the Minister of Religion Number 184 of 2019
- Hamidah, A. (2014). Students' perceptions of biology practicum activities in public high school laboratories in Jambi City. *Sainmatics : Jambi University Journal of Science and Mathematics*, 8(1), 221111.
- Pujianti, N., Munandar, A., Surakusumah, W. (2018). Environmental literacy in agriculture and coastal areas. *Journal of Physics: Conf. Series*, 1013(012007).
- Khasanah, F., Susilaningsih, E., & Nuswowati, M. (2017). Journal of Innovative Science Education Guided Inquiry-Based Questions Integrated Practice Worksheets Design to Improve Laboratory Skills and Knowledge. *Journal of Innovative Science Education*, 6(2), 235-242. <http://journal.unnes.ac.id/sju/index.php/jise>.
- Mastura, Maulisa, Nurhafidah. (2017). Design of a Chemistry Practical Guide Based on Natural Materials. *Journal of Science and Science Learning*, 1(2), 203-212.
- Subamia, IDP, Wahyuni, I. GAN. S., & Widiasih, NN (2014). Device Development Supporting Environmentally Oriented Middle School Science Practicum. *Journal of Education and Teaching*, 47(1), 29-39.
- Najib, A., & Misrochah, N. (2020). Drafting Chemo-Entrepreneurship Oriented Chemistry Practical Instructions for Buffer Solutions. *Journal of Educational Chemistry (JEC)*, 2(2), 57.
- Risqi, SW, & Wahyuni, TS (2022). Development of Guided Inquiry Based Practical Worksheets Vision of Science, Environmental, Technology and Society (SETS) on electrolyte and non-electrolyte solution materials. *Journal of Chemical Education*, 11(1), 78-86.
- Parahita, A., Susilaningsih, E., & S. (2018). Development of an Integrated Guided Inquiry Student Practicum Worksheet for Laboratory Skills Analysis. *Chemistry in Education*, 7(1),

24-31.

- Suryawati , E., Suzanti , F., Zulfarina , Putriana , AR, Febrianti, L. (2020). The Implementation of Local Environmental Problem Based Learning Student Worksheets to Strengthen Environmental Literacy. *Indonesian Journal of Science Education*, 9(2), 169-178.
- Singh, R.L. (Ed.) . (2017). Principles and applications of environmental biotechnology for a sustainable future (1st ed.). Springer Science+Business Media.
- Ali, Z. Z. (2021). Community Service Lectures From Home Based on Moderation Religious . *DEDICATION: Journal of Community Service*, 3(2), 175-188.
- Sutrisno, CI (1921). The Nature and Principles of Community Service by Higher Education . *Community Service Methodology Training for PTN and PTS Lecturers in East Java*.
- Government Regulation Number 30 of 1990, article 43 paragraph 1
- Nurrita , T. (2018). Development of learning media to improve student learning outcomes . *Misykat Journal* , 3(1), 171-187.