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Basic Research Capabilities Improvement Through Training of Supporting Research Tools

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Abstrak

Research is an important activity for Higher Education. Higher Education always encourages the lecturers and students to conduct useful research for the society. The importance of improving the quality of basic research skills for students is the background of this activity. This Community Service activity aims to provide insight and understanding related to the use of research supporting tools such as VOSviewer, Publish or Perish, and Mendeley. This activity involved students from the Faculty of Economics Universitas Musi Rawas and the Faculty of Economics and Business, Universitas Muhammadiyah Prof. Dr. HAMKA as the participant. The method of organizing this activity is a classical method such as explanation from speakers and interactive discussions with participants. The conclusion of the activity is that participants' insights and understanding of VOSviewer, Publish or Perish, and Mendeley have increased. These conclusions were obtained through pre and post questionnaires distribution.



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1. Introduction

Recently, challenges from technological, social, cultural, and other aspects are unavoidable in our society. The challenges and developments of these aspects can contribute the positive and negative impacts on society. The role of higher education/universities is expected to answer existing challenges and problems through problems solving contribution in society and knowledge development. Challenges and problems in society include unemployment, limited employment, social inequality, corruption, and so on (Sahrin et al., 2022). Education is an important aspect in overcoming the challenges and problems faced by this nation. The government plays an important role in supporting the successful implementation of education. The results of the existing educational process are expected to be able to produce competent resources in their fields. Higher Education plays an important role in producing competent and quality of human resources.

Higher Education is mandated to carry out education, research, and community service optimally. Those activities are not only carried out by lecturers, but also carried out by students.

Students are expected to become ethical leaders by participating in education, research, and community service (Ariani, 2019). The role of students in solving problems in society can also be done through research. They can carry out research and contribute to society in accordance with their educational background.

Based on Law No. 3 of 2020, research is an activity carried out with a systematic process and method that aims to obtain an understanding, information funds, information, and so on. Law No. 23 of 2023 also explains that the results of research are expected to increase the role of science in developing the country. Research is an activity that cannot be separated from the implementation of Higher Education activities (Anggraini & Putri, 2023). Students conduct research in the process of their study completion. In addition, research conducted by students as a form of implementation of Merdeka Belajar Kampus Merdeka (MBKM). MBKM facilitates students to explore other activities at other study programs or other university. Through the MBKM program, students are given the opportunity to become research assistants for one semester to one year. Research can also give experience in solving problems, analysing situation and data, and providing conclusions (Lesmana, 2023). Education encourages lecturers and students to pursue their knowledge and develop it in the form of research (Aisyah, 2016).

Researchers need strong motivation in doing research. Research is a continuous process consisting of expressing, elaborating, and organizing ideas systematically (Abbas, 2015). Researchers need strong ideas to continue and survive in the research process (Abbas, 2015; Widodo et al., 2020). Researchers also face other challenges in research such as understanding problems, limited reference search, understanding theory, divided focus, unstable motivation, and so on (Abbas, 2015). Researchers must be able to start the research by writing down the background of the research clearly. Research background can come from a problem, a difference in previous research results, a gap between theory and practice, and so on. Researchers must be able to combine ideas and data that can be understood by readers.

Another challenge in research is in terms of choosing a research topic or title. Researchers must define interesting topics, research novelty, and contribution to the society's problem. Lecturers and students sometimes find difficulties to find research novelty. The research novelty is based on a review of previous literature and an in-depth understanding of research problems. Literature review is an important matter in research that contain important concepts on the topic (Dalle & Agussalim, 2022). Conducting a literature review requires rigor and diligence for finding references and relevant information in research (Dalle & Agussalim, 2022). Literature review can be done by researchers using technology by mapping meta data from many articles and published papers. The mapping can display meta data information such as journal names, authors, publication dates, and so on. The meta data can be collected through the help of the Publish or Perish Application (Arianto, 2022). Developing information technology is useful in providing information in research (Retnowati et al., 2018).

Beside supported by a proper literature review, good research is also supported by good references. References used in research can be managed to make it easier for researchers to retrieve sources of supporting information. There are relatively many references used in the study, so researchers have difficulty managing them manually (Rahmawati et al., 2018). The technology that is currently developing also makes it easy for researchers to manage references to make bibliography automatically. Managing the reference list automatically will reduce the risk of incomplete inclusion of the reference sources used. Good research must be supported by a list of quality references (Hardy, 2021). The Mendeley application is a solution for researchers to manage references effectively and efficiently (Hardy, 2021).

The background of this community service activity is that it is necessary to increase students' skills in using technology to support research. Currently, quite a few students do not understand how to search for meta data with the help of technology. So reviewing the literature takes a relatively long time. Apart from that, students also still have difficulty mapping meta

data according to their needs. For example, students still have difficulty finding relevant topics that are rarely researched. Apart from that, there are still many students who do not manage references with the help of technology. Students still create bibliography manually. Students also do not fully manage existing references systematically. The purpose of this activity is to add insight and understanding of participants in the use of VOSviewer, Publish or Perish, and Mendeley in student research. From these various backgrounds, the team provided solutions to conduct training on the use of VOSviewer, Publish or Perish, and Mendeley for students of the Faculty of Economics, Universitas Musi Rawas and students of the Faculty of Economics and Business, Universitas Muhammadiyah Prof. Dr. HAMKA.

2. Implementation Method

This activity is carried out online using the Zoom Cloud Meeting application, but this training is still packaged interactively. Training activities are carried out using the classical method with a lecture approach (material presentation), practice, and discussion with the intention that the material can be well received by the participants. The classical method is expected to be delivered as attractive as possible so that the participants can receive learning effectively and efficiently (Sulandari, 2020).

The participants of this community service ranged from 100 participants consisting of students of the Faculty of Economics, Universitas Musi Rawas and students of the Faculty of Economics and Business, Universitas Muhammadiyah Prof. Dr. HAMKA. Students involved are students who will take thesis courses. This is intended so that participants can prepare themselves in conducting research and optimizing technology in scientific writing.

The team design several activities to achieve the community services objective. This community service activity is carried out in the following stages.

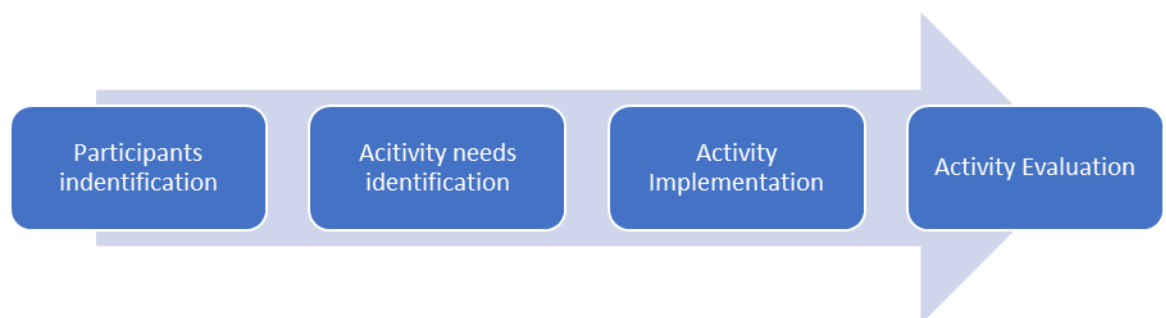


Figure 1. Activity Process

Source: Self Processed, 2023.

At the participant identification process, the team communicates with other lectures. The team interviewed those lecturers and asked about the problems experienced by students in doing research. The lecturer explained that the problem that emerged was that students were not optimal in using technology for their research. This problem causes less efficient in doing research. For example, students still write bibliography manually in the research. At the identification of activity needs process, the team discusses about the proposals content. The proposal is written in detail consist of the background, solutions, methods, and schedule of activities. The team find relevant speakers who experienced in using VOSviewer, Publish or Perish, and Mendeley.

RESULTS AND DISCUSSION

This Community Service was carried out online via the Zoom Meeting Application on Monday, June 26, 2023. Most of the participants consisted of students and lecturers from Universitas Musi Rawas and Universitas Muhammadiyah Prof. Dr. HAMKA. The team distributed the registration form for participants by including an online form for the pre-test. The pre-test was conducted about a week before the activity execution. The pre-test was conducted to find out the knowledge and understanding of the use of VOSviewer, Publish or Perish, and Mendeley from participants. The material presented at this community service activity was the concept and implementation of VOSviewer, Publish or Perish, and Mendeley applications to Improve Research Quality. Material on the concept and use of the Publish or Perish (PoP) and Mendeley applications was delivered by the first speaker, Dr. Muhammad Yusuf, S.E., M.M. Meanwhile, material on the concept and application of VOSviewer was delivered by the second speaker, Dr. Ayatulloh Michael Musyaffi.

Dr. Muhammad Yusuf, S.E., M.M informed that Publish or Perish (PoP) is an application that can be used to obtain bibliographic metadata (except in fulltext form) for scientific papers from all fields of science. PoP is an application that is free of charge with various benefits. PoP is useful in assisting the literature review process, searching scientific references, determining publication destination journals, monitoring researcher performance performance, and bibliometric analysis. Databases that can be accessed in the use of Publish or Perish itself include Crossref, Google Scholar, PubMed, OpenAlex, Scopus, Semantic Scholar to Web of Science.



Figure 2. Publish or Perish's Advantage

Source: Self Processed, 2023.

PoP works by browsing and selecting the database you want to use. After that, the user can proceed with entering keywords. Users can also capture literature as needed or by relevant year. Deep Dr. Muhammad Yusuf, S.E., M.M also demonstrated the practice of using Mendeley. The process starts from; (1) Creating an account on <http://www.mendeley.com> web; (2) Download Mendeley for desktop via web <http://www.mendeley.com/downloads>; (3) Creating personal folders by presenting various options that include pressing the "Add Files" button followed by the "Folder" button, manually adding PDF documents into Mendeley Desktop by "Drag & Drop", and automatically adding PDF documents into Mendeley Desktop with the "Watch Folders" menu, selecting the "Import/Export" option to other reference management software, "One-click" web importer menu, and "Reference Search" using the Mendeley website; (4) Organize documents and references by checking for double references, sorting documents by marking when the document has been read, marking favourites on selected references, looking for references according to document type, to giving additional

notes to documents; (5) Citing References using Word and OpenOffice plug-ins to how to create a bibliography.

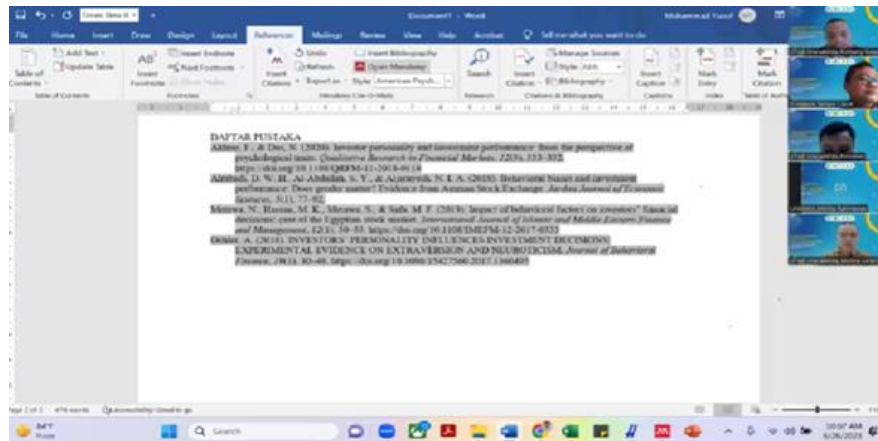


Figure 3. Mendeley's Output
Source: Self Processed, 2023.

The use of the Mendeley Application helps users to manage references such as storing in the Mendeley database. In addition, users can use reference as needed. Users can also perform citations automatically up to the preparation of a central list automatically and organized.

After the delivery of material related to Research Quality Improvement Efforts through the concept drawing and implementation of the Mendeley and Publish or Perish applications by Dr. Muhammad Yusuf, S.E., M.M. The training was continued by Dr. Ayatulloh Michael Musyaffi, S.E., Ak., M.Ak. about the same effort as how to find research mapping and novelty using the VOSviewer application. He explained that the purpose of using Vos Viewer itself includes revealing data trends that appear in the performance of articles and journals, mapping collaboration patterns, exploring intellectual structures and specific domains, to understanding large volumes of unstructured data in a rigorous way.

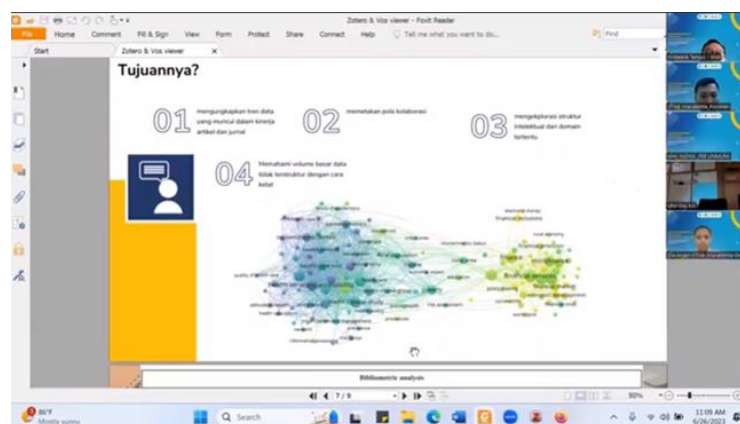


Figure 4. VOSviewer's Output
Source: Self Processed, 2023.

In the presentation of the second speaker, bibliometric analysis was also described which includes the main technical and other complementary techniques. The main technicalities in bibliometric analysis itself are divided into two, namely Publication-Related Metrics and Science Mapping. The Publication-Related Metrics feature itself includes Citation-related metrics, and Citation-and-publication-related metrics, and Science Mapping itself includes Citation analysis, Co-citation analysis, Bibliographic computing, Co-word analysis, Co-authorship analysis. The complementary techniques include Network Analysis which includes Network metrics, Clustering, and Visualization. After the presentation of the material, the agenda continued with a question-and-answer session by the participants interactively before finally the agenda was closed. On the closing agenda, the activity implementation team distributed online forms for activity evaluation and post-test. Post-test is conducted to compare participants' knowledge and understanding before and after the activity.

Table 1. Pre-test and Post-Test's Result

Number	Question	PRE-TEST			POST-TEST			Trend in YES Answers
		Yes Answer	No Answer	Total Answers	Yes Answer	No Answer	Total Answers	
1	Do You Know the VOSviewer Application?	17	83	100	71	29	100	Increase 318%
2	Do You Know the Publish or Perish (PoP) Application?	57	43	100	86	14	100	Increase 51%
3	Do You Know the Mendeley Application?	62	38	100	89	11	100	Increase 44%
4	Can you operate VOSviewer Application?	8	92	100	91	9	100	Increase 1038%
5	Can you operate Publish or Perish (PoP) Application?	46	54	100	74	26	100	Increase 61%
6	Can you operate Mendeley application?	41	59	100	72	28	100	Increase 76%

Source: Self Processed, 2023.

From table 1 above, it can be seen the comparison of pre-test and post-test results from 100 participants. There was an increase in participants' knowledge of the existence of VOSviewer, Publish or Perish, and Mendeley, namely by 318%, 51%, and 44%, respectively. The greatest increase in knowledge related to the existence of VOSviewer was increased from 17 participants who knew its existence to 71 participants. The pre-test and post-test also asked about students' understanding/skills in using the three applications. There was an increase in VOSviewer, Publish or Perish, and Mendeley usage skills by 1,038%, 61%, and 76%, respectively. The biggest improvement in understanding/skills in using VOSviewer was increased from 8 participants who knew its existence to 91 participants. The pre-test conducted both asking related knowledge and understanding / skills of using VOSviewer experienced the highest increase among the other two applications. In addition to the questions in table 1.

At first, relatively few participants knew and could operate VOSviewer. This is suspected because there are still many student studies in strata 1 that use research gaps in the form of inconsistent previous research results. Another background is the difference in research periods or units of analysis on pre-existing topics or titles. The emphasis on research novelty may not yet be the focus of students. Another thing is also suspected because students are still comfortable mapping literature studies by making mapping tables manually.

There are additional questions given during the post-test by the team. The additional questions given are listed in table 2 below.

Table 2. Additional Post-Tests Questions

Number	Question	POST TESTS ANSWERS		
		Yes	Maybe	Total
1	Do you intend to use this supporting application in your next research projects?	80	20	100
2	Do you think VOS Viewer, Publish or Perish (PoP), and Mendeley help you to carry out your research activities?	87	13	100
3	Do you think VOS Viewer, Publish or Perish (PoP), and Mendeley can make research more efficient?	87	13	100

Source: Self Processed, 2023.

From table 2 above, it informed that 80% of participants will intend to use technology in research such as VOSviewer, Publish or Perish, and Mendeley. From table 2 above, it showed that 87% of participants consider that the use of VOSviewer, Publish or Perish, and Mendeley is beneficial for their research activities. 87% of the total participants also stated that VOSviewer, Publish or Perish, and Mendeley could make their research more efficient. This efficiency can be caused because with the help of technology, research work is faster and easier. The magnitude of participants' intention to use VOSviewer, Publish or Perish, and Mendeley was possible because participants focused on attending training and paying attention to demonstrations of application use by resource persons. The team also provides recordings and training materials for participants so that this may also be the reason for the high intention of participants to use the application. Participants can review the materials that have been submitted by the speaker.

The team also provided an online form for the evaluation of this community service program. 40 participants stated that the speaker mastery of the material presented was very good, 52 answered well, and 8 answered quite well. 44 participants stated that the speaker ability to deliver the material was very good, 47 participants stated good, and 9% answered quite well. 45 participants stated that the speaker's ability to interact with participants was very good, 45 stated good, 9 stated good enough, and 1 participant stated not good. 45 participants stated that the delivery of activity information by the team was very good, 47 participants stated good, and 8 people stated quite good. 40 participants stated that the quality of the training media was very good, 56 answered well, and 4 participants answered quite well. 46 participants said the activity was done very well, 49 answered well, and 5 other participants answered quite well.

3. Conclusion

The conclusion of this community service activity is that there is an increase in insight and understanding from participants. This was concluded through questions conducted before and after the implementation of community service. The increase in insight and understanding was because the speaker explained the material comprehensively, the desire of participants to use applications in this training, and the ease of accessing training materials. The speaker not only explained the theory or concept of VOSviewer, Publish or Perish, and Mendeley, but the speaker demonstrated the use of the application. The team also provides interactive discussion sessions so that participants' understanding of this training material can be maximized. The next suggestion for community service activities with the same topic is that the team can make activities directly or offline with not too many participants. Further activities can also be carried out periodically so that the progress of participants' competencies can be more measurable so that goals can be achieved more optimally.

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