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Identification of Biology Education Research during The Covid-19 Pandemic

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ABSTRACT

Research activities are one aspect of supporting the competence of biology teachers. Through research activities, a prospective teacher can support the development of some competencies. There are many things that can be a variation or distinguish between one research and another, especially in biology education research conducted by college students. this article discusses the characteristics of biology education research carried out by final year students during the Covid-19 pandemic. This study uses a quantitative descriptive method which number of samples in the study were 57 people. The research results show that biology education research conducted during the pandemic mostly uses descriptive methods and quasi-experimental methods. In addition, there are meta-analytical research methods from international journals with PRISMA guidelines and literature studies using scoping review techniques carried out by students. A total of 71.9% of the study used a sample of students at the high school and college level. As many as 76% of research data were obtained online, 19% of research activities were blended, and only about 5% of students obtained research data offline. Constraints experienced by students during research are: 1) Internet network is not stable, 2) students find it difficult to turn on the camera in the data collection process, 3) it is relatively difficult to collect respondents' responses in online questionnaires, 4) is constrained by research time due to the large number of school holidays, 5) online communication becomes an obstacle in conducting research guidance.

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1. INTRODUCTION

Research activities are one aspect of supporting the competence of biology teachers. Based on law number 14 of 2005 concerning teachers and lecturers, it is stated that several competencies that must be possessed by teachers are pedagogic, professional, personality, and social competencies. Through

research activities, a prospective teacher can support the development of some of these mandatory competencies. Therefore, students as prospective biology teachers have an obligation to be able to carry out research. Research can be interpreted by studying various aspects that are of interest to researchers. Therefore, each researcher has a different motivation in carrying out his research (Hutagalung & Utomo, 2017). However, in carrying out research activities, a researcher must prioritize professionalism and objectivity. So that research results can have an impact on science and the quality of education. One solution to problems in the world of biology education is through research and learning (Zubaidah, 2019).

There are many things that can be a variation or distinguish between one research and another, especially in biology education research conducted by college students. Some of the differences that cause this diversity include research methods, studies studied, research data sources, research samples and populations, how to obtain research data, how to analyze research data, and the literature used. In general, research can be divided into two approaches, namely: qualitative and quantitative approaches. The quantitative approach is research related to data in the form of numbers, while qualitative research is related to written, oral, and behavioral descriptive data as a result of observation (Hasnunidah, 2017). While the data in the study can be classified into primary data and secondary data. Primary data is data that comes directly from the research sample. While secondary data is data whose source is not directly from the research sample (Hamid & Susilo, 2015).

The Covid-19 pandemic has had an impact on various activities in lecture activities. Activities that are usually carried out in schools, laboratories must adapt to new situations, namely the transfer of all real activities into activities carried out in cyberspace. Things that have been routinely done are forced to switch digitally or use internet facilities to facilitate every activity on campus, including student research activities. Online activities (on the network) also include the implementation of biology education research conducted by final year students. Based on the results of research (Maknun, Gloria, & Muzakki, 2020) informs that students' research skills are in the poor category. The results of another study (Santosa & S., 2020) showed that during the Covid-19 pandemic there had been difficulties among students in understanding the material within the scope of biology education. Based on the characterization of the research and these problems, this article discusses the characteristics of biology education research carried out by final year students during the Covid-19 pandemic.

2. METHODS

This study uses a quantitative descriptive method, which describes the results of the study using meaningful numbers. Collecting data using survey techniques using research instruments in the form of a questionnaire sheet with semi-open questions. Researchers used closed and open type research instruments. There are two types of questions in the questionnaire used, namely multiple choice and short entries about the characteristics of biology education research that has been carried out accompanied by the obstacles found. The research instrument was given to the research sample with the help of an online questionnaire platform. The research sample is a student of the Biology Education study program at the University of Muhammadiyah Prof. Dr. Hamka who has carried out his final project research in 2021. The number of samples in the study were 57 people. The research was carried out in Jakarta in August-November 2021.

3. FINDINGS AND DISCUSSION

In this section, we describe the results of research on the characteristics of biological education research conducted during the Covid-19 pandemic. Characterization of research Biology education

described includes a description of the research methods used, techniques in obtaining data, an overview of the research samples used, types of data obtained, research studies, research implementation time, research publications, and obstacles encountered in the research process.

A. Research Method Used

Biology education research conducted by final year students has a variety of research methods in the form of experiments, descriptive, research and development, surveys, interviews, observation, meta-analysis, and combined research methods. The following is the trend of using research methods by students during the pandemic.

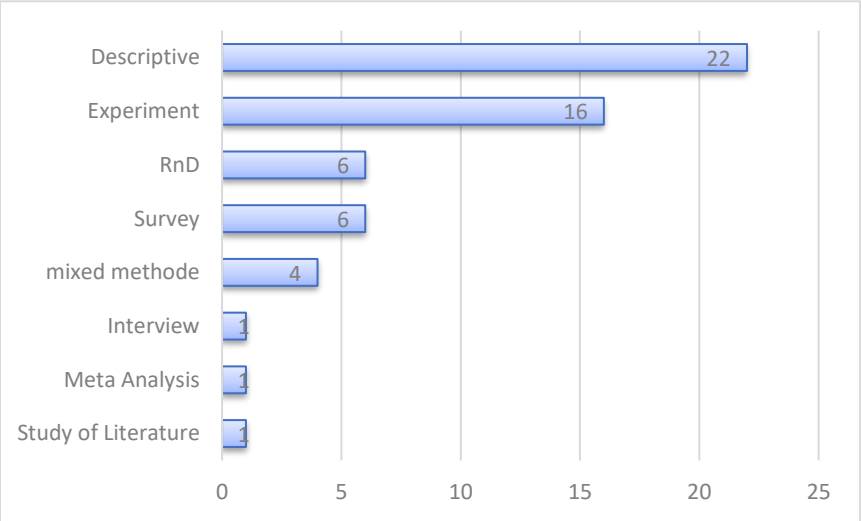

Figure 1. Research Methode Used

Based on the data from the questionnaire obtained several research methods used by students in carrying out their research. The descriptive method is used by most students in their research during the pandemic. Furthermore, sequentially the research methods used are experimental methods, development methods, survey methods, combined methods, interviews, meta-analysis, and literature studies. In some studies, combined methods are used in the form of surveys with interviews, and surveys, interviews and observations. The results of this study are quite in line with the analysis of Biology Education research by (Damanik, et al., 2022) which states that the Quasi Experiment method is the most widely used method. Several research methods are relatively new used by students, namely the scoping review technique on the literature study method. In addition, there is a narrative analysis technique in the interview and observation method. There are students who provide information using the meta-analysis method with PRISMA guidelines. Based on the results of research (Sudarisman, 2013) provides information that there are two types of research methods for Biology Education student thesis research, namely classroom action research and quasi-experimental research.

B. Research Sample Characteristics

Biology education research generally uses samples in the form of human resources in the form of students and teachers at the high school and college level. In the Biology Education research conducted during the pandemic period, we found research samples from educators, experts, and scientific documents on research literature studies and meta-analyses.

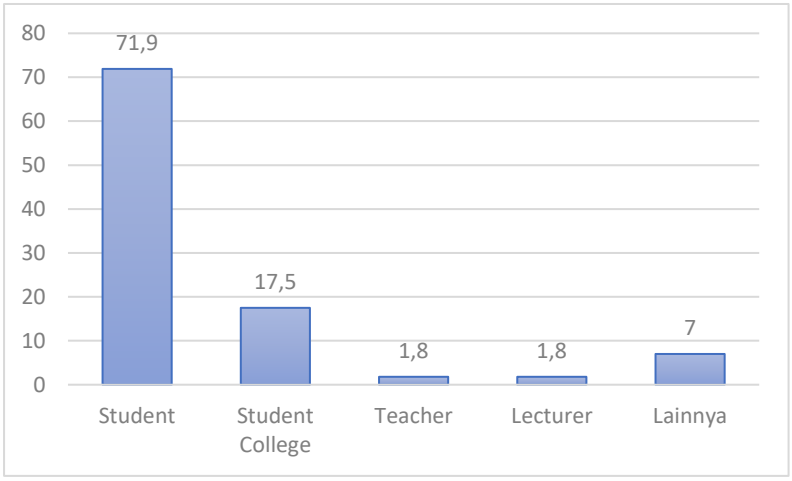

Figure 2. The Research Sample Used

Based on the data from the questionnaire, it is known that students in schools are the most widely used sample in biology education research during the pandemic, with a percentage of 71.9% of the research population. Next, students became the second largest sample used in biology education research during a pandemic with a percentage of 17.5%. Educators at the school and college level are also used by students in their research with a percentage of 1.8%. Finally, there are 7% of the population using other samples such as analysis of scientific articles in international journals and expert opinions on development research. The results of this study are in line with (Damanik, et al., 2022), (Zubaidah, 2018), (Nursaeni, 2016), which states that in biology education research trends have the most widely used research sample, namely Junior High School (SMP) students.

C. Research Data

The characteristics of presenting research data and how to collect research data are described in this section. The following is a description of how students collect research data.

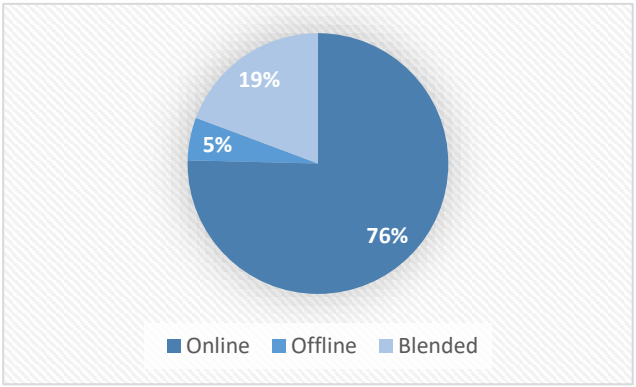

Figure 3. How to Collect Research Data

Based on the information collected, 76% of the research data were obtained online or face-to-face in the real world. There are 19% of research activities carried out by two methods, namely online and offline. Only about 5% of students obtain research data offline. Biology education face to face directly or offline. Technology has a very important role in educational communication between teachers and students as well as other educational interactions during the pandemic (Salsabila et al., 2020). The characteristics of online education interactions are active, personal, structured, connective (Kutsiyyah,

2021). School academic activities carried out online can increase independence and the ability to recognize the potential of students (Maesaroh, 2021). In the research data presentation section, 42.1% of the students presented their research data in quantitative form. The presentation of quantitative and qualitative data was also carried out by 42.1% of the student group. While the remaining 15.8% presented research data in qualitative form.

D. Research Time and Publications

Based on information from the research respondents, it was obtained data on variations in the implementation of the research process ranging from 1 to 10 months. The following is information about the average length of time biological education research is carried out.

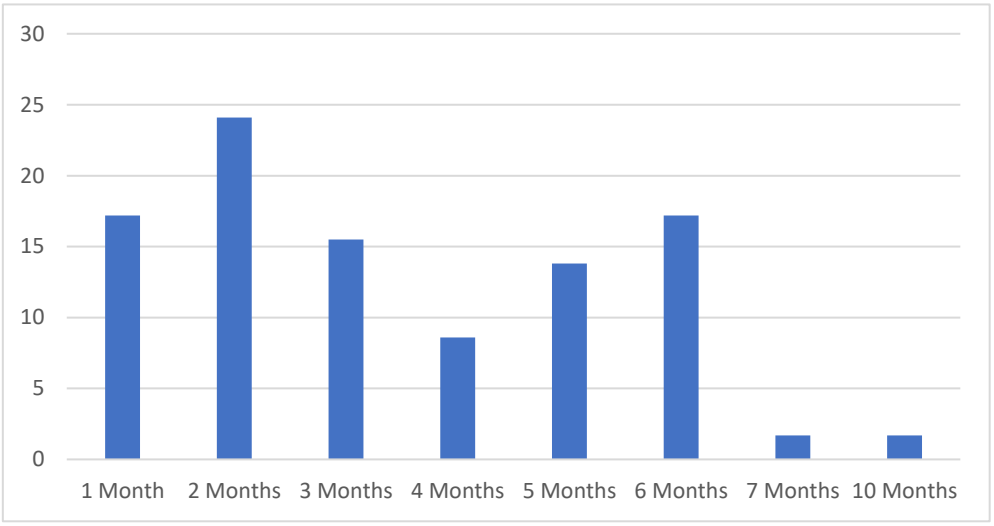

Figure 4. Research Time

Based on the information obtained, Biology education research can generally be completed within two months. In the second place, students carry out research for one month and six months. Quite a number of students complete their research within three months and five months. There is a small student population that requires seven months and ten months of research time. In general, educational research takes a long time at the planning stage which includes the activities of making research instruments, validation processes and instrument testing. In the next section, data about the publication plans that will be carried out by students on the results of their research are presented.

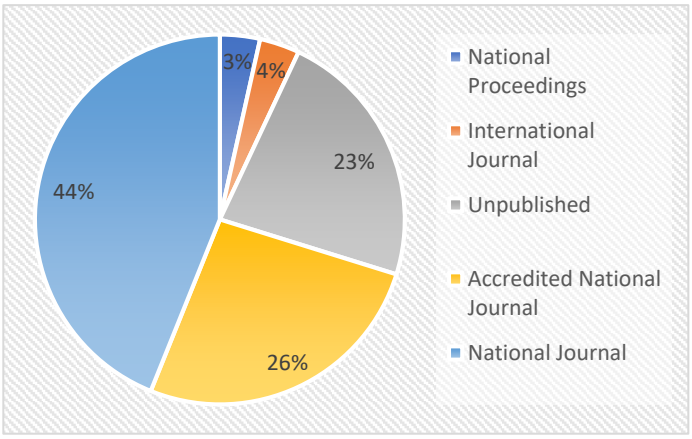

Figure 5. Research Publication

The majority of the research that has been carried out will be published in national journals by 44% of students. Meanwhile, 26% of other students stated that they would publish their research results in accredited national journals. There are 23% of research results that are not planned to be published. Publication at the international level is planned by 4% of students, and the remaining 3% will publish at the national level seminar proceedings. Based on the results of research (Irhandayaningsih, 2020), (Kartikawati, 2019) it is known that students who take part in online learning are able to compile scientific articles well in terms of making citations, comparing research results, and finding reference sources. A high need for reference sources was identified by research (Yuhanna, 2021) on the learning needs of college-level students.

E. Research Study Materials

Several research themes of Biology education studied by students related to online learning, online learning motivation, student metacognition, student learning difficulties, science process skills, about habits of mind (habit of mind), higher order thinking skills, science learning experiences, learning models, virtual reality, environmental care, environmental preservation, environmental literacy, and bioethics. Several research studies related to environmental themes raised by research sample students are in line with research results (Gul & Sozbilir, 2015), (Zubaidah, 2018) which states that the research trend of Biology Education is studying the environment and ecology. In other research results, informing that in Education research, most students raise the theme of learning methods and learning outcomes (Nursaeni, 2016). In biological education research, interactive activities in learning, critical thinking, analysis, and creative skills in solving problems with science process skills are important research study materials (Sudarisman, 2015). The selection of study materials or themes in research is influenced by the lecturers and/or students themselves. There are 52.5% of students stated that they have chosen their own research theme. Furthermore, 37.7% of students chose the research theme on the advice of the supervisor. There are 9.8% of students who are members of the umbrella research made by the supervisor. In general, biological education research discusses the efforts made so that students can learn well (Irsadi, 2014).

F. Kendala Penelitian

There are several obstacles that students encounter when conducting research during the pandemic, some of which are: 1) Internet network 2) Students are less cooperative in turning on the camera in the data collection process, 3) it is relatively difficult to collect respondent responses in online questionnaires, 4) constrained by research time. because there are many school holidays, 5) online communication in conducting guidance can be misunderstood, 6) difficulty in making research instruments, 7) waiting time for instrument validation from several experts is quite long, 8) constrained in obtaining research permits, 9) constrained in communication with friends in doing research due to the pandemic situation, 10) difficulties in arranging the language of scientific articles that are good and correct. The results of this study are in line with the findings (Yuhanna, 2021) which revealed that the internet is one of the priority needs of students in carrying out lectures during the pandemic. In addition to the field of research, in the world of education also encountered several obstacles due to the pandemic situation, including network access, IT mastery, supervision, and participant inactivity (Asmuni, 2020). In addition, there is a potential for saturation that occurs in educational activities that are carried out fully online (Pawicara, 2020). This is in line with research (Khasanah, Ningrum, & Aprilia, 2020) which states that as many as 61.87% of students experience problems with online educational interactions. The development of literacy and technology training is one solution in dealing with the challenges of online learning (Salsabila et al., 2020).

4. CONCLUSION

In general, biology education research conducted during the pandemic mostly uses descriptive methods and quasi-experimental methods. In addition, there are meta-analytical research methods from international journals with PRISMA guidelines and literature studies using scoping review techniques carried out by students. A total of 71.9% of the study used a sample of students at the high school and college level. As many as 76% of research data were obtained online, 19% of research activities were blended, and only about 5% of students obtained research data offline. Constraints experienced by students during research are: 1) Internet network is not stable, 2) students find it difficult to turn on the camera in the data collection process, 3) it is relatively difficult to collect respondents' responses in online questionnaires, 4) is constrained by research time due to the large number of school holidays, 5) online communication becomes an obstacle in conducting research guidance.

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