Proceeding SYMBION
(Symposium on Biology Education)
http://seminar.uad.ac.id/index.php/symbion
2540-752X (print) | 2528-5726 (online)

Descriptive Analysis of Inventory of Equipment and Materials for Biology Laboratory Activities in High Schools throughout Banjarnegara Regency

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ARTICLE INFO

Article history
Submission Dec 12th, 2022
Revision Feb 20th, 2023
Accepted March 28, 2021

Keyword
Inventory
Biology
Banjarnegara

ABSTRACT

Laboratory management is an attempt to manage the laboratory in order to have good governance. One of the laboratory management activities is the inventory of laboratory equipment and materials. Inventory is important in recording, storing and controlling the tools and materials contained in the laboratory. The aim of this research is to describe inventory activities for biology laboratory equipment and materials in high schools throughout Banjarnegara district. This research is descriptive research with data collection techniques using an open questionnaire (Google form) and using descriptive analysis techniques. Most high schools in Banjarnegara district still use the manual/conventional method by using the media of inventory recording books. Apart from that, most high schools in Banjarnegara district also carry out maintenance on laboratory equipment after the equipment has been used and on a regular basis. All high school samples in Banjarnegara district have stored laboratory equipment and materials in special storage cabinets. Apart from that, most high schools in Banjarnegara district still have problems, namely the lack of laboratory assistants. Therefore, most high schools in Banjarnegara district require professional laboratory staff to support laboratory management. Apart from that, there are other needs such as the procurement of computers and a digital inventory system (website) to support the process of recording inventory of tools and materials in biological laboratories.

Introduction

Biology is a natural science that studies life and living creatures, including their structure, function, growth, evolution, distribution and taxonomy[1]. Biology learning is carried out to gain an understanding of nature so direct experience is needed to develop students'

abilities to explore the natural surroundings. Biology learning will be more optimal if it is supported by providing real experience to students, one of which is by carrying out practical activities[2]. According to Dewi et al, practical activities can increase students' understanding and can make biology learning activities more enjoyable[3]. Apart from that, practical activities are also a strong form of teaching to learn students' skills, understanding and attitudes. According to Putri'research, practical activities in the laboratory can run well if they are supported by adequate laboratory facilities and infrastructure in accordance with the minimum standards regulated in Minister of National Education Regulation no. 24 of 2007[4].

A laboratory is often defined as a room or place where experiments or research are carried out[5]. According to Riandi's research, the laboratory is a place to train students in terms of skills in doing practice, demonstrations, experiments, research, and knowledge development. A good laboratory can be seen in terms of complete facilities and infrastructure to support learning activities[6]. According to Permendiknas no. 24 of 2007, the ideal biology laboratory facilities that must exist in a biology laboratory include biology laboratory furniture, educational equipment (props and experimental tools and materials), consumable materials and other biology laboratory equipment. Therefore, because there are quite a lot of biological laboratory facilities and infrastructure, laboratory management is needed to manage the biology laboratory facilities and infrastructure.

Laboratory management is an effort to manage laboratories so that they have good governance[7]. According to Barnawi and Arifin's research, laboratory management is a series of activities including planning, organizing, implementing, and supervising functions in the form of laboratory management processes so that laboratory activities can be carried out effectively and efficiently[8]. According to Subamia et al, to increase the efficiency and effectiveness of laboratory activities, laboratories must be managed and utilized as well as possible[9].

Laboratory management needs to be taken seriously so that the laboratory can function according to the purpose of its procurement. Laboratories that are not managed properly will result in the procurement of tools and materials not functioning as a result. Laboratory management includes activities to organize, maintain and ensure the safety of laboratory users[10]. One of the laboratory management activities is the inventory of laboratory equipment and materials. Inventory is important in recording, storing and controlling the tools and materials contained in the laboratory. According to Hamidah's research, inventory of tools and materials includes records regarding the number of each tool, materials, number of purchases or additional tools and materials, number of tools broken, lost or damaged after use. Each laboratory needs to be equipped with a tool and material list book, tool and material card, purchase list book, broken, damaged, lost, used up goods list book, as well as a laboratory diary[11]. Several things that need to be considered in inventorying laboratory equipment and materials are: (1) tool or material code, (2) name of tool or material, (3) equipment or material specifications (brand, type, manufacturer), (4) source of purchase tools and year of procurement, (5) years of use, (6) quantity or size, and (7) condition of tools (good or damaged)[12].

Inventory of biological laboratory equipment and materials in high schools throughout Banjarnegara district generally still uses manual/conventional methods, namely using inventory recording books. Inventory that still uses manual/conventional methods can cause several problems such as triggering many errors and errors in the inventory recording process[13], as well as making the inventory process of tools and materials take a lot of time and not well organized and making the reporting process difficult late[14]. This is in line with research conducted by Hamidah et al, regarding biology laboratory management in private high schools in the city of Jambi[11]. In this research, it was found that 7 private high schools in the city of Jambi, namely SMA Nusantara, SMA Islam Al-Falah, SMA Yadika, SMA Dharma Bhakti 4, SMA Adhyaksa 1, SMA Dharma Bhakti 3, and SMA PGRI 2 still used manual/conventional methods using

book media inventory of tools and materials in carrying out inventory activities. The aim of this research is to describe inventory activities of biological laboratory equipment and materials in high schools in Banjarnegara district, maintenance of biological laboratory equipment and materials in high schools in Banjarnegara district, storage of biological laboratory equipment and materials in high schools in Banjarnegara district, obstacles. in inventory activities of biological laboratory equipment and materials in high schools throughout Banjarnegara district as well as needs in inventory activities of biological laboratory equipment and materials in high schools throughout Banjarnegara district.

Method

This research is a descriptive research aimed at describing the activities of inventorying tools and materials for biology laboratories in high schools in Banjarnegara district. The population in this study were all high schools in Banjarnegara district which had biology laboratories separate from science laboratories. The sample for this research was 10 high schools in Banjarnegara district which were selected using purposive sampling. The research subjects studied were biology teachers who also served as heads of biology laboratories in high schools throughout Banjarnegara district. The research object studied was the inventory of biological laboratory equipment and materials in high schools throughout Banjarnegara district. The data collection technique used in this research was an open questionnaire in the form of a Google form. The data analysis technique used in this research is descriptive analysis technique.

Results and Discussion

The results obtained based on open questionnaire data collection conducted for biology teachers in 10 high schools in Banjarnegara district are presented in table 1 which shows the methods and media used in recording the inventory of biology laboratory tools and materials used by 10 high schools in Banjarnegara district.

Table 1. Table 1. Methods and media for inventory of tools and materials for high school biology laboratories in Banjarnegara district.

School Name	Method	Media
SMA Negeri 1 Sigaluh	Conventional	Inventory Record Book
SMA Negeri 1 Karangkobar	Digital	Microsoft Word/Excel application
SMA Negeri 1 Purwanegara	Conventional	Inventory Record Book
SMA Negeri 1 Purwareja-Klampok	Digital	Microsoft Word/Excel applications
SMA Negeri 1 Batur	Blended (Conventional and Digital)	Inventory Recording Book, Microsoft Word/Excel applications
SMA Negeri 1 Bawang	Digital	Microsoft Word/Excel applications
SMA Negeri 1 Wanadadi	Blended (Conventional and Digital)	Inventory Record Book, Microsoft Word/Excel Application
SMAS Muhammadiyah 1 Banjarnegara	Conventional	Inventory Record Book
SMAS Cokroaminoto Banjarnegara	Conventional	Inventory Record Book
SMA Negeri 1 Banjarnegara	Conventional	Inventory Record Book

Table 1 shows that 5 out of 10 high schools in Banjarnegara district, namely SMA Negeri 1 Sigaluh, SMA Negeri 1 Purwanegara, SMAS Muhammadiyah 1 Banjarnegara, SMAS Cokroaminoto Banjarnegara, and SMA Negeri 1 Banjarnegara still use conventional methods by using inventory recording media in carrying out inventories. and also making reports. According to Hakim et al, recording inventory manually (conventionally) can make it difficult for laboratory assistants to record inventory data because it takes a long time to record items in the laboratory[15]. In addition, recording inventory manually (conventionally) can cause delays in data information if there are items that are suddenly damaged and there is no writing improvement on the report.

In addition, 3 out of 10 high schools in the Banjarnegara district, namely Karangkobar 1 Public High School, Purwareja-Klampok 1 Public High School and Bawang 1 Public High School have used the digital method using Microsoft Word/Excel media in carrying out inventories and also making reports. According to Eriya's research, management of laboratory equipment such as data collection, borrowing and returning which is carried out using the Microsoft Excel application still raises various problems, one of which is the unavailability of valid and real time information about the availability and status of laboratory equipment so that the equipment management process laboratories, especially in lending transactions, become less efficient[16]. In addition, the data storage method using Microsoft Excel can increase the risk of data loss. When a computer is exposed to a virus, all laboratory equipment inventory data in Microsoft Excel will be lost[17]. According to Taupik et al, managing inventory assets with Microsoft Excel can cause problems such as duplication of data, less integrated data and difficulty making reports because it involves many files and takes a long time[18].

Meanwhile, 2 out of 10 high schools in the Banjarnegara district, namely SMA Negeri 1 Batur and SMA Negeri 1 Wanadadi, used the blended method using an inventory record book as a medium for recording inventory and Microsoft Word/Excel as a medium for making reports. According to Kristiyanto's research, the process of laboratory inventory activities using Microsoft Excel as a medium for data processing (reports) and ledgers used to store data can cause the management of laboratory equipment inventory data to be not optimal and cause several problems[17]. The problem that often occurs is that officers have difficulty presenting reports quickly because officers have to compare all existing equipment data in Microsoft Excel with data in the ledger.

Based on data collection from an open questionnaire conducted on biology teachers in 10 high schools throughout Banjarnegara, results were obtained regarding the maintenance of biology laboratory equipment and materials in 10 high schools in Banjarnegara district which are presented in table 2.

Table 2. Maintenance of high school biology laboratory equipment and materials in Banjarnegara district.

School Name	Maintenance of Tools and Materials
SMA Negeri 1 Sigaluh	Some laboratory equipment is maintained periodically, but not too routinely.
SMA Negeri 1 Karangkobar	Laboratory equipment that has been used in the practicum is immediately cleaned and stored back in the storage cupboard.
SMA Negeri 1 Purwanegara	Maintenance of tools and materials is carried out regularly, tools that have been used in the practicum are immediately cleaned, meanwhile, materials that have been used, the containers are immediately cleaned and stored according to procedures.

SMA Negeri 1 Purwareja-Klampok	Laboratory equipment is periodically cleaned of dust, for equipment such as computers, maintenance is carried out by experts. Meanwhile, laboratory materials are treated by separating materials based on their expiration date.
SMA Negeri 1 Batur	Tools and materials are cleaned and dried after use, then put in the equipment cupboard. Equipment such as microscopes are maintained routinely and periodically. The material storage container is closed tightly after being used in practical activities and stored in the material cupboard.
SMA Negeri 1 Bawang	Tools are cared for by washing and drying the tools after use, after which the tools are stored in a special tool cabinet. Meanwhile, the container of the material that has been used is then closed tightly and placed in the material cupboard.
SMA Negeri 1 Wanadadi	Tools and materials are maintained routinely and periodically.
SMAS Muhammadiyah 1 Banjarnegara	Tools and materials are maintained, cleaned and checked regularly.
SMAS Cokroaminoto Banjarnegara	Laboratory equipment that has been used is cleaned using tissue and a cloth if the laboratory equipment is dirty. The container for consumables after being taken is immediately closed tightly and the remaining materials that have been used are immediately disposed of.
SMA Negeri 1 Banjarnegara	Laboratory equipment and materials are cleaned regularly every 6 months. for ingredients labeled as expired.

Table 2 shows that 6 out of 10 high schools in the Banjarnegara district, namely Sigaluh 1 Public High School, Karangkobar 1 Public High School, Purwareja-Klampok 1 Public High School, Batur 1 Public High School, Banjarnegara 1 Muhammadiyah High School and Banjarnegara 1 Public High School carry out maintenance of laboratory equipment by means of cleaning laboratory equipment after each use in practicum activities, this is intended so that laboratory equipment can always be available in a clean and sterile condition and always ready to be used in further practicum activities. This is in line with the opinion of Jufriyah et al, which states that tools that are often used in practicum activities and are used by many people, then these tools will get dirty or damaged quickly[19]. Therefore, the process of cleaning and storing laboratory equipment after being used in practical activities is very important as an effort to maintain the function of laboratory equipment[20]. Examples of laboratory equipment that must be cared for after use include beakers, Erlenmeyer flasks, test tubes and funnels.

Figure 1. Beaker, Erlenmeyer, Test Tube and Funnel

Meanwhile, 4 out of 10 high schools in Banjarnegara district, namely Purwanegara 1 Public High School, Bawang 1 Public High School, Wanadadi 1 Public High School and Cokroaminoto Banjarnegara High School carry out periodic maintenance of laboratory equipment. According to Jufriyah's research, routine and regular maintenance and storage of equipment can prevent damage to laboratory equipment[19]. Damage to laboratory equipment will directly result in large costs for replacing damaged equipment components. Therefore, several laboratory tools such as microscopes must be maintained and maintained properly because microscopes are very susceptible to damage, especially damage to the lens caused by environmental humidity. A microscope that is stored in a damp place is likely to grow mold on the objective and ocular lenses[19]. One way to prevent the effect of humidity on the microscope is to install an electric light in the microscope storage area, so that the air in the cupboard becomes drier. In addition, the microscope storage box must be given an adsorption agent (silica gel) to absorb water.

Figure 2. Monocular Microscope

Regarding the maintenance of laboratory materials, 2 out of 10 high schools in Banjarnegara district, namely SMA Negeri 1 Purwanegara and SMAS Cokroaminoto Banjarnegara, maintain laboratory materials by labeling them with expiration dates. The aim is for laboratory assistants to know the expiry date of laboratory materials so that laboratory materials that are nearing their expiry date can be used first in practical activities. This is in accordance with Minister of Health Regulation Number 43 of 2013 which states that existing laboratory materials must be handled carefully using the FIFO (first in first out) and FEFO (first expired first out) principles. According to Dinda's research, the implementation of FIFO aims to ensure that the quality of laboratory materials used for practical activities can be maintained and the materials do not expire when used[21]. Meanwhile, the implementation of FEFO aims to ensure that laboratory materials that have reached their expiry date can be thrown away immediately and not stored with laboratory materials that have not yet expired.

Meanwhile, 2 out of 10 SMAs in the Banjarnegara district, namely SMAS Muhammadiyah 1 Banjarnegara and SMA Negeri 1 Banjarnegara, carried out maintenance on laboratory materials by disposing of the remaining laboratory materials that had been used to the waste treatment site. According to Raharjo's research, chemical residues from experiments are prohibited from being returned to the original parent container, this is because the remaining chemicals from experiments are likely to have been contaminated by other substances during practicum activities[22]. In addition, chemical waste or other materials are also not allowed to be disposed of through sewers because they have the potential to cause pollution to the environment and even potentially be harmful to surrounding life[23]. Therefore, the remaining waste of laboratory materials must be managed properly so as not to harm the laboratory and pollute the surrounding environment.

Based on data collection from an open questionnaire conducted on biology teachers in 10 high schools in Banjarnegara district, results were obtained in the form of storage and preparation of biology laboratory tools and materials used by 10 high schools in Banjarnegara district which are presented in table 3.

Table 3. Storage and arrangement of tools and materials for high school biology laboratories in Banjarnegara district.

School Name	Storage and Arrangement of Tools and Materials
SMA Negeri 1 Sigaluh	Laboratory equipment is stored in the equipment storage cupboard. Equipment storage is grouped based on the material the laboratory equipment is made from (glass, wood, iron) and grouped based on their function.
SMA Negeri 1 Karangkobar	Laboratory equipment is stored in a special equipment cupboard and arranged based on the type of material the equipment is made from. Materials are stored in special containers and arranged based on their level of reactivity.
SMA Negeri 1 Purwanegara	Laboratory equipment is stored in a separate cupboard, while laboratory materials are stored in a showcase
SMA Negeri 1 Purwareja-Klampok	Laboratory tools are placed in the tool cabinet and in the equipment warehouse, laboratory materials are stored in the consumables cupboard
SMA Negeri 1 Batur	Laboratory tools are arranged based on the shape, size and function of the tool. Breakable equipment is placed in cupboards and easily accessible, for heavy equipment and placed below
SMA Negeri 1 Bawang	Laboratory materials are put into the materials cupboard, arranged based on material requirements and expiration date. Ingredients that are frequently used and expire more quickly are placed at the front. Meanwhile, dangerous laboratory materials are stored in special places and locked
SMA Negeri 1 Wanadadi	Laboratory equipment is stored in a cupboard in the equipment room. Meanwhile, laboratory materials are stored in the materials cupboard
SMAS Muhammadiyah 1 Banjarnegara	Laboratory tools and materials are stored in special shelves and arranged based on intensity of use
SMAS Cokroaminoto Banjarnegara	Laboratory equipment is stored in a special storage room and arranged based on the function and shape of the laboratory equipment. Laboratory materials are stored in the materials cupboard and arranged based on the properties of the materials
SMA Negeri 1 Banjarnegara	Laboratory equipment is stored in cupboards according to the type of material it is made from, for example glass, iron, plastic and wood. Storage of laboratory equipment also adjusts the resistance of laboratory equipment to sunlight, air humidity, temperature and so on. Laboratory materials are stored in special cupboards and arranged alphabetically. Dangerous and toxic laboratory materials are stored in cupboards that have chimneys

Table 3 shows that all samples of high schools in Banjarnegara district already have special cupboards for storing laboratory equipment, but what is different is the system for arranging laboratory equipment. As many as 3 of the 10 high schools in Banjarnegara district, namely SMA Negeri 1 Sigaluh, SMA Negeri 1 Karangkobar and SMAS Cokroaminoto Banjarnegara, store laboratory equipment based on the type of material from which they are made, such as glass, wood, iron and porcelain. Meanwhile, in 2 of the 10 high schools in Banjarnegara district, namely SMA Negeri 1 Batur and SMAS 1 Muhammadiyah Banjarnegara,

the storage of laboratory equipment is arranged based on function, shape and size. According to Raharjo's research, when storing and preparing tools, it is necessary to pay attention to the type of basic materials that make up the tools in order to determine how to store them[23]. Tools made from metal must be separated from tools made from glass, porcelain or wood. Apart from that, aspects of the weight and size of the tool also need to be considered. Heavy and large tools should not be placed on high shelves because the tools will be difficult to retrieve.

Figure 3. laboratory equipment cupboard

Regarding storage of materials, 2 out of 10 high schools in Banjarnegara district, namely SMA Negeri 1 Batur and SMA Negeri 1 Wanadadi, storage of laboratory materials is arranged based on intensity of use and expiration date. This is in accordance with Minister of Health Regulation Number 43 of 2013 which states that existing laboratory materials must be handled carefully using the FIFO (first in first out) and FEFO (first expired first out) principles. Laboratory materials arranged based on intensity of use and expiry date are intended to make the use of laboratory materials more effective and reduce expired chemical waste in material storage areas. In addition, 2 out of 10 SMAs in the Banjarnegara district, namely SMA Negeri 1 Karangkobar and SMAS Muhammadiyah 1 Banjarnegara, stored laboratory materials based on their nature and level of reactivity. This is in accordance with the theory from Novitrie et al, which states that laboratory chemicals must be stored based on their physical, chemical and level of danger in accordance with the Decree of the Head of Bapedal 1995 Number 1[24]. This aims to avoid reactions or hazardous contact. between one chemical and another. Meanwhile, 1 out of 10 high schools in Banjarnegara district, namely SMAS Cokroaminoto Banjarnegara, has its laboratory materials stored alphabetically. This is in line with the opinion of LFX, which states that laboratory chemicals can be arranged alphabetically so that these materials are easier to find even by people who have just entered the laboratory[25]. According to Raharjo, in the preparation of laboratory materials, alphabetical sorting would be appropriate if they were grouped according to their physical and chemical properties, especially in terms of their level of danger for administration[22].

Meanwhile, 3 out of 10 high schools in the Banjarnegara district, namely SMA Negeri 1 Batur, SMA Negeri 1 Banjarnegara and SMAS Cokroaminoto Banjarnegara, store hazardous chemicals in a special place that is locked and equipped with a chimney for ventilation. According to LFX, places for storing materials such as acids, ethers and chloroform should be placed in a special cupboard for acidic chemicals that has a chimney[25]. This means that if a gas leak occurs, it will not spread because the gas will go straight out through the chimney.

Figure 4. Acid chemical cupboard

Based on data collection from an open questionnaire conducted on biology teachers in 10 high schools in Banjarnegara district, results were obtained regarding the obstacles in recording the inventory of biological laboratory equipment and materials used by 10 high schools in Banjarnegara district. Presented in diagram form in figure 5.

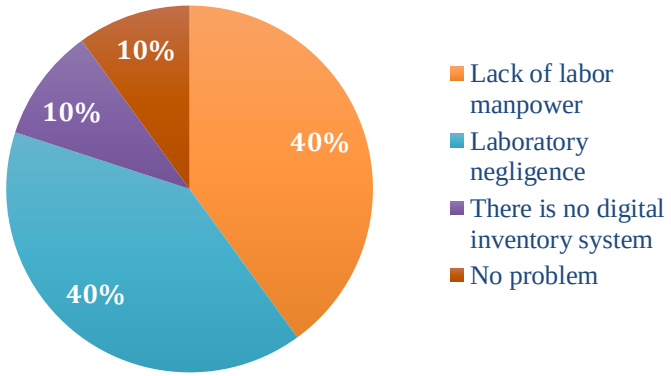

Figure 5. Diagram of Constraints in Recording Inventory of Tools and Materials

The diagram above shows that 40% of the 10 high schools in Banjarnegara district experience a shortage of laboratory staff. This is experienced by SMA Negeri 1 Sigaluh, SMAS Muhammadiyah 1 Banjarnegara and SMAS Cokroaminoto Banjarnegara who do not have laboratory assistants in their biology laboratories. All forms of administrative activity and inventory recording of tools and materials are carried out by the biology teacher who also serves as the head of the biology laboratory. Meanwhile, SMA Negeri 1 Batur only has 1 laboratory assistant who manages 3 laboratories at the same time namely biology, physics and chemistry laboratories so that the management of the biology laboratory is not optimal. According to Muna's reserach, laboratory assistants are needed to support laboratory activities starting from preparing material tools, helping to clean and returning all material tools that have been used to their original state[26]. The role of the laboratory assistant includes managing the laboratory, for example checking equipment for damaged and finished materials, arranging for placement, helping to handle administration and maintaining the cleanliness and security of the laboratory.

Meanwhile, 40% of the 10 high schools in Banjarnegara district experienced problems due to the negligence of laboratory staff in taking care of recording inventory of tools and materials. The negligence committed by laboratory staff at SMA Negeri 1 Bawang and SMA

Negeri 1 Purwanegara was the lack of routine inventory of equipment and materials in the laboratory. Meanwhile, the negligence committed by the laboratory staff at SMA Negeri 1 Purwanegara was that the laboratory assistants were unable to maintain equipment and material inventory data properly so that many were lost and not identified. Apart from that, at SMA Negeri 1 Wanadadi, laboratory assistants did not record damaged laboratory equipment and materials. This makes inventory data for tools and materials in biological laboratories incomplete and can hamper the administration and reporting process. Negligence from laboratory staff indicates that the laboratory staff are less professional and less competent. According to Burhanuddin's research, laboratory personnel are one of the dominant components in laboratory development[27]. Therefore, professional laboratory personnel are needed to improve the quality of laboratory management processes. According to Minister of National Education Regulation Number 26 of 2008, there are 4 main competencies that must be fulfilled as a laboratory assistant or laboratory technician, including, (1) personality competency, (2) social competency, (3) administrative competency, and (4) professional competency.

As many as 10% of the 10 high schools in Banjarnegara district experienced problems due to the lack of a digital inventory system that supports inventory recording activities of tools and materials in biology laboratories. SMA Negeri 1 Banjarnegara still uses manual/conventional methods using inventory recording book media in carrying out activities for recording and reporting inventory of tools and materials. SMA Negeri 1 Banjarnegara needs a digital inventory system to help simplify inventory recording activities for tools and materials in its biology laboratory. Meanwhile, another 10% of the 10 high schools in Banjarnegara district, namely SMA Negeri 1 Karangkobar, admitted that they did not have any problems in the process of recording inventory of tools and materials in their biology laboratories.

Furthermore, based on data collection from an open questionnaire conducted on biology teachers in 10 high schools in Banjarnegara district, results were obtained regarding the needs for recording an inventory of biological laboratory equipment and materials used by 10 high schools in Banjarnegara district which are presented in table 4.

Table 4. Needs for inventory of tools and materials for high school biology laboratories in Banjarnegara district.

School Name	Requirement
SMA Negeri 1 Sigaluh	Laboratory staff and digital inventory devices (system).
SMA Negeri 1 Karangkobar	Computer
SMA Negeri 1 Purwanegara	Laboratory and computer staff
SMA Negeri 1 Purwareja-Klampok	Computer
SMA Negeri 1 Batur	Laboratory assistants who are specifically responsible for one laboratory only, a complete administrative data list of tools and materials, adequate space or space, appropriate storage cupboards, a list of tools and materials in each cupboard and a digital-based tool and material inventory system
SMA Negeri 1 Bawang	Complete data regarding transactions and the number of tools and materials
SMA Negeri 1 Wanadadi	Laboratory staff and a set of printing equipment
SMAS Muhammadiyah 1 Banjarnegara	Laboratory staff, digital data collection system for laboratory equipment and materials
SMAS Cokroaminoto Banjarnegara	Computer/laptop
SMA Negeri 1 Banjarnegara	Digital inventory system

Table 4 shows that 5 out of 10 high schools in the Banjarnegara district, namely Sigaluh 1 Public High School, Purwanegara 1 Public High School, Batur 1 Public High School, Wanadadi 1 Public High School and Banjarnegara 1 Muhammadiyah High School, need laboratory assistants to support biology laboratory management activities. According to Muna (2016), laboratory assistants are needed to support laboratory activities starting from preparing material tools, helping to clean and returning all material tools that have been used to their original state. The role of the laboratory assistant includes managing the laboratory, for example checking equipment for damaged and finished materials, arranging for placement, helping to handle administration and maintaining the cleanliness and security of the laboratory.

As many as 3 out of 10 high schools in Banjarnegara district, namely SMA Negeri 1 Karangkobar, SMA Negeri 1 Purwareja-klampok and SMAS Cokroaaminoto Banjarnegara need computers to support inventory recording activities and making inventory reports of tools and materials in biology laboratories. Meanwhile, Wanadadi 1 Public High School requires a set of printing equipment (printer and HVS paper) to support activities in making inventory reports of tools and materials in the biology laboratory.

Meanwhile, 2 out of 10 high schools in Banjarnegara district, namely SMA Negeri 1 Batur and SMA Negeri 1 Wanadadi, require complete data regarding administrative lists, quantities and transactions of equipment and materials. Complete data is needed to assist the laboratory management process, especially in preparing practical activities and preparing inventory reports for equipment and materials in the biology laboratory. Apart from that, SMA Negeri 1 Batur also needs adequate space and space to support practical activities in the biology laboratory as well as special storage cabinets that are suitable for storing laboratory equipment and materials more properly.

As many as 3 out of 10 high schools in Banjarnegara district, namely SMA Negeri 1 Sigaluh, SMA Negeri 1 Batur and SMA Negeri 1 Banjanegara need a digital inventory system for tools and materials to facilitate inventory of tools and materials in biology laboratories. One digital tool and material inventory system that can be utilized is a website or tool and material inventory application. According to Suryaningsih, the use of an inventory website for laboratory equipment and materials can make it easier to manage laboratory administration in one place, including managing inventory, borrowing and returning as well as reporting[28]. In addition, the website for inventory of laboratory tools and materials also has real time data and can be accessed anywhere and anytime.

Conclusion

Based on the results that have been obtained, it can be concluded that the majority of high schools in Banjarnegara district still use the manual/conventional method by using the media of inventory recording books. In addition, most high schools in the Banjarnegara district have also carried out maintenance of laboratory equipment after the equipment has been used and periodically, as well as laboratory materials which are treated by separating hazardous chemicals and also closing laboratory material containers after use and disposing of the remaining materials to an appropriate place. waste treatment. All sample high schools in Banjarnegara district have stored laboratory tools and materials in special storage cabinets arranged by type, shape, size and function of the equipment and arranged alphabetically, the nature and level of reactivity of laboratory chemicals. Meanwhile, most high schools in Banjarnegara district still have problems, namely the lack of laboratory staff, and there are still negligence caused by laboratory assistants. Therefore, most high schools in Banjarnegara district require professional laboratory staff to support laboratory management. Apart from that, there are other needs such as the procurement of computers and a digital inventory system (website) to support the process of recording inventory of tools and materials in biological laboratories.

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