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Submission date: 19-Jul-2024 04:56PM (UTC+0700)

Submission ID: 2419121105

File name: 184-8-3-Ahmad_Syaeful_Anam.pdf (220.7K)

Word count: 4368

Character count: 26029

Analysis of School Readiness, Human Resources, and Maintenance and Care for Optimizing School Computer Laboratory Functions

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DOI:

Received: April 2024	Accepted: June 2024	Published: July 2024
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Abstract :

This study aims to determine the influence of school readiness, human resources, and care and maintenance on optimizing the function of the school computer laboratory by conducting a case study at MTs Muhammadiyah 2 Kedungadem, Bojonegoro. This study is quantitative research with a correlational type. The independent variables in this research are school readiness (X1), human resources (X2), and care and maintenance (X3). Meanwhile, optimizing the function of the school computer laboratory (Y) is the dependent variable.

Keywords : *school readiness, human resources, computer lab*

Abstrak :

Kajian ini bertujuan untuk mengetahui pengaruh kesiapan sekolah, sumber daya manusia, dan pemeliharaan serta perawatan terhadap optimalisasi fungsi laboratorium komputer sekolah dengan melakukan studi kasus di MTs Muhammadiyah 2 Kedungadem, Bojonegoro. Kajian ini merupakan penelitian 4 kuantitatif dengan jenis korelasional. Variabel bebas dalam penelitian ini adalah kesiapan sekolah (X1), sumber daya manusia (X2), dan pemeliharaan serta perawatan (X3). Adapun optimalisasi fungsi laboratorium komputer sekolah (Y) merupakan variabel terikat.

Kata Kunci : *kesiapan sekolah, sumber daya manusia, laboratorium komputer*

INTRODUCTION

Education in the current digital era requires adequate infrastructure support to support effective learning. One of the important facilities in the learning process is the computer laboratory at school. The computer laboratory is not only a place to study information technology, but also a center for learning activities that encourage the development of students' technology skills and digital literacy. School readiness in providing optimal computer

laboratories is a crucial factor in ensuring that the learning process runs smoothly and effectively. However, this readiness is not only limited to physical aspects, but also involves skilled human resources in managing and maintaining these facilities.

However, to ensure that the computer laboratory functions optimally as a learning tool, schools need to pay attention to several important aspects. First of all, school readiness in providing adequate physical infrastructure is very important (Raberi et al., 2020; Galus et al., 2021). This includes technical aspects such as an adequate number of computers, a stable internet connection, as well as up-to-date hardware and software that meets learning needs. However, it turns out that school readiness is not only limited to technical aspects. Human resources who are skilled and trained in managing and utilizing a computer laboratory are also a crucial factor. Teachers who are competent in integrating technology in learning, as well as technical personnel who can manage and maintain hardware and software, will greatly contribute to maximizing the potential of computer laboratories as learning tools.

Additionally, ongoing support and training for school staff is also important to ensure that they remain skilled and up to date in using technology. This training can also help in overcoming barriers that may arise in the use of technology in the learning environment. Next, no less important, is the maintenance and upkeep of computer laboratory facilities (Pitriani, 2023). Regular maintenance and upkeep of computer laboratory facilities should also not be neglected. By keeping hardware and software in optimal condition, schools can ensure that learning runs smoothly without unwanted technical interruptions. Regular maintenance and good maintenance will help extend the life of hardware and software, as well as reduce the risk of technical problems that can disrupt the learning process.

In optimizing the function of computer laboratories in schools, the role of human resources is very vital. Skilled and trained human resources have an important role in ensuring that computer laboratories not only function as physical places equipped with technology, but also as effective learning centers in developing students' technology skills and digital literacy (Ilyas, 2021). Human resource readiness in the context of a computer laboratory involves several key aspects. First of all, teachers are the spearhead in integrating technology in learning. They need to have a deep understanding of the various technological applications that can be used in learning, and be able to adapt the curriculum to exploit the potential of this technology. Apart from that, teachers must also have skills in designing and managing learning activities that involve the use of computer laboratories, so that learning can take place effectively and enjoyable (Darmanto et al., 2023).

Apart from teachers, support from school administrative staff is also very important. They are responsible for managing the logistical and administrative aspects related to the use of the computer laboratory. Good support from administrative staff can ensure that computer laboratory facilities are always ready to use, as well as facilitate the process of borrowing devices for teachers and students. Not only that, continuous professional training and

development for all school staff is also a key factor in ensuring the readiness of human resources. This training should not only focus on the use of technology, but also on innovative teaching strategies and evaluation methods that are relevant in the context of technology-based learning (Masril et al., 2020).

Once the computer laboratory has been installed and human resources have been prepared, the next step which is no less important is the care and maintenance of the laboratory. Proper maintenance can ensure that facilities continue to function optimally, avoid hardware damage or failure, and provide a smooth and efficient learning experience for students. Computer laboratory maintenance involves a series of preventive and proactive measures that must be taken regularly. First of all, physical laboratory maintenance involves maintaining hardware, such as computers, monitors, keyboards, and mice. This includes regular cleaning to avoid dust buildup that can interfere with device performance, as well as periodically checking the physical condition of the hardware to detect any damage or wear that may occur (Ramadani et al., 2023; Alkodri et. al, 2023).

Apart from that, the software also requires regular maintenance. This includes ensuring that the operating system and application programs are always updated with the latest versions, as well as running regular antivirus scans to protect the computer laboratory from malware or virus attacks that could damage data or disrupt system performance. In addition to routine maintenance, it is also important to have an in-depth maintenance plan to address any problems that may arise. This includes being prepared to address hardware failures, such as damaged hard disks or components that need to be replaced, as well as having effective data recovery measures in place in the event of data loss or serious system damage.

Apart from technical maintenance, laboratory management also needs to pay attention to the ethical and safe use of computer laboratories. This includes implementing clear usage policies, monitoring laboratory usage activities, and providing training to students on safe and ethical ways to use technology. In addition, it is also important to pay attention to ethical and security aspects in using technology. Human resources in schools need to be trained to understand and teach the principles of digital ethics to students, as well as manage and maintain data and information security in a computer laboratory environment.

Optimizing the function of computer laboratories in schools is an important process to ensure that these facilities not only function as a place to access technology, but also as an effective and productive learning environment for students. This optimization involves a number of steps and strategies aimed at maximizing the potential of the computer laboratory so that it can provide maximum benefits for the educational process (Aviany et al., 2022).

One of the first steps in optimizing the function of a computer laboratory is ensuring that the physical infrastructure is adequate. This includes having a sufficient number of computers, up-to-date hardware, and a fast and reliable internet connection. Good infrastructure will provide smooth and uninterrupted access for students and teachers in using technology in learning. Furthermore, the integration of technology in the curriculum and teaching

methods is key in maximizing the benefits of computer laboratories (Rofiuddin, 2021). Teachers need to design learning activities that incorporate the effective use of technology, so that students can develop technology, digital literacy and problem-solving skills simultaneously. The use of relevant and useful technology tools and applications will also increase the attractiveness of learning for students.

Then, ongoing support and training for teachers and school staff is also important in optimizing the function of the computer laboratory. This training includes not only the use of technology, but also innovative teaching strategies and relevant evaluation methods. Teachers who are skilled in integrating technology in learning will be able to create interesting and meaningful learning experiences for students. Last, but not least, is the ongoing evaluation of the effectiveness of computer lab use. Schools need to regularly evaluate the learning outcomes achieved through the use of technology, as well as identify areas that need improvement or improvement. In this way, schools can continue to improve and optimize the use of computer laboratories to support their educational goals.

This research aims to examine the influence of school readiness, human resources, and care and maintenance on optimizing the function of the school computer laboratory with a case study at MTs Muhammadiyah 2 Kedungadem, Bojonegoro. Meanwhile, the aim of this research is to determine the influence of school readiness, human resources, and care and maintenance on optimizing the function of the school computer laboratory.

RESEARCH METHOD

This research uses a qualitative method with a literature study approach identified by descriptive and exploratory analysis. Research methods can be viewed as research plans and procedures which include steps in the form of broad assumptions to detailed methods in data collection, analysis and interpretation (Sugiyono, 2018). In this study, the research results will be in the form of descriptions and narratives.

The focus of the research will be to limit the research to select which data is relevant and which data is irrelevant (Creswell & Creswell, 2021). The limitations in this qualitative research are based more on the level of importance/urgency of the problems faced in this research. This research will focus on school readiness, human resources, and laboratory care and maintenance at MTs Muhammadiyah 2 Kedungadem, Bojonegoro. Data collection techniques are used by: 1) observation; 2) interview or interviews; and 3) documentation. A number of findings in the form of facts and data are stored in material in the form of documentation. Most of the available data is in the form of letters, regulations, policies, attendance, reports, photos, and so on. Apart from that, there are stages of data analysis carried out in this research, namely domain analysis, taxonomy, componential and theme analysis.

Meanwhile, data analysis techniques are used by data reduction, namely selecting, focusing attention, abstracting and transforming data; triangulation, namely interviews, observations, and documents; and draw conclusions.

FINDINGS AND DISCUSSION

School Readiness

In an era of education that continues to develop, school laboratories have become a crucial element in supporting practical learning for students. Laboratories not only provide space for scientific experiments, but also play an important role in honing students' practical skills and facilitating in-depth understanding of theoretical concepts studied in the classroom.

To be able to optimize the function of the school laboratory, thorough preparation is the main key. This not only includes the provision of adequate equipment and practical materials, but also infrastructure support that enables effective use of the laboratory. MTs Muhammadiyah 2 Kedungadem, Bojonegoro has succeeded in managing the laboratory well by having a well-planned strategy and strong commitment from the school and teachers.

First of all, an effective laboratory must be equipped with up-to-date and standardized equipment. This includes practical tools that are not only safe to use but also able to support varied and curriculum-relevant experiments. Support from the school in terms of budget for equipment, maintenance and continuous improvement is crucial to ensure the laboratory continues to function optimally.

Apart from equipment, laboratory readiness also includes the preparation of teachers and teaching staff who are responsible for teaching in the laboratory. Regular training and capacity building for laboratory teachers is an important step to ensure they can manage practicums well and provide effective guidance to students. A deep understanding of safety procedures, experimental ethics, and the ability to integrate technology in learning are competencies that must be mastered by laboratory teachers.

School infrastructure also plays an important role in supporting the effective functioning of laboratories. This includes security aspects, adequate room layout, and internet connectivity that allows fast access to information and data sources to support student experiments. A space that is clean, well organized, and provides an environment conducive to learning is also an important factor in creating an optimal learning experience for students.

Optimizing the function of school laboratories not only has an impact on improving the quality of student learning in terms of scientific practicum, but also on developing skills such as teamwork, problem solving and critical thinking. With thorough preparation and strong commitment from all relevant parties, school laboratories can become dynamic and inspiring learning centers for future generations.

In today's digital era, a computer laboratory at school is not just a room with a series of standard computers and hardware. Computer laboratories are a vital foundation in supporting modern, technology-based learning. To ensure that the computer laboratory functions optimally, schools must pay attention to several key fundamental aspects.

First of all, adequate technological infrastructure is the main foundation for computer laboratory readiness. Every piece of hardware, from computers

and monitors to keyboards and mice, must be selected with the needs of today's educational applications in mind. Adequate specifications not only improve performance, but also ensure that every student can access and use technology effectively.

Apart from that, a stable and fast internet connection is an absolute requirement. The availability of reliable internet ensures that learning activities that rely on online are not disrupted by network problems, such as annoying lag or disconnection.

The cyber security aspect should also not be ignored. Schools must ensure that every device is protected with the latest security software and that there are clear procedures in place for dealing with potential digital security threats. This involves not only protecting technology, but also educating students and staff about good digital security practices.

The importance of skilled human resources (HR) in managing and maintaining a computer laboratory cannot be ignored. Having a competent IT technician or network administrator is essential to carry out routine maintenance, fix technical problems, and ensure that devices are always in optimal condition.

The integration of computer laboratories into the curriculum and learning is also a key factor. Educational programs that include the effective use of technology and training for teachers in integrating technology into their teaching will increase the benefits of using computer laboratories.

Furthermore, good technology asset management planning is very necessary. This includes budget planning for hardware maintenance and replacement, as well as strategies for regularly updating technology to remain relevant to educational and technological developments (Pitriani, 2021).

Finally, support from related parties, such as parents, school foundations, or local governments, is critical in providing the resources necessary to update computer laboratory infrastructure and technology.

By paying attention to all of these aspects, schools can ensure that their computer laboratories are ready to support effective and innovative learning. This readiness not only advances students' learning experiences, but also prepares them to face technological challenges in an increasingly digital future.

Human Resources

In an effort to optimize the function of school laboratories, the role of human resources cannot be ignored. Human resources in this context include laboratory teachers, support staff, and school management who play a role in providing the support and infrastructure needed for practical and effective learning.

Laboratory teachers at MTs Muhammadiyah 2 Kedungadem, Bojonegoro play a crucial role as main facilitators in teaching and learning in the laboratory. They not only master the knowledge of the material being taught, but also have practical skills in managing experiments and laboratories. Their ability to design experiments that are relevant to the curriculum, provide effective guidance to students, and maintain safety and security during practicums are important factors in creating meaningful and safe learning experiences for

students.

Apart from that, regular training and professional development is also very necessary for laboratory teachers. This training not only improves their technical skills in using laboratory equipment, but also enriches their teaching methods so that they can be more interesting and relevant to students' current needs. By updating their knowledge of the latest technology, experimental ethics, and innovative learning strategies, laboratory teachers can contribute significantly to improving the efficiency and effectiveness of school laboratories.

Apart from laboratory teachers, the role of supporting staff such as laboratory technicians, school administration who take care of the procurement of equipment and materials, as well as laboratory security is also very important. Laboratory technicians are responsible for ensuring equipment is functioning properly, well maintained, and safe for use by students and teachers. They also played a role in providing technical assistance when needed during the experiment.

School management has the responsibility to provide sufficient budget for laboratory maintenance and organize physical and human resources to suit teaching needs. Availability of adequate space, arranging an efficient practicum schedule, and supporting laboratory-based learning initiatives are also their responsibilities.

By recognizing the importance of competent human resources and supported by effective management, school laboratories can become dynamic and inspiring learning centers for students. Collaboration between all relevant parties ensures that the laboratory not only functions technically well, but is also able to produce learning experiences that are motivating, meaningful and relevant for the next generation of science.

Behind every effective computer laboratory in a school, there is an important role played by human resources (HR). They are not only technical managers, but also at the forefront in ensuring that the technology functions optimally to support modern learning processes.

IT technicians and network administrators are responsible for everything from hardware installation to software configuration. They must have deep technical expertise to ensure that every computer and device is properly connected and ready for use by students and faculty. Routine maintenance such as hardware cleaning and software updates are also an important part of their responsibilities. This action not only extends the life of the hardware, but also optimizes the overall performance of the computer laboratory.

Continuous education and training is also an integral part of HR's role. They must stay updated with the latest technological developments, including cyber security strategies, integration of technology in the curriculum, and how to best support the use of technology in educational settings. With up-to-date knowledge, they can provide effective support to computer laboratory users, both in dealing with technical issues and providing training to new users.

Apart from technical aspects, technology asset management is also the responsibility of HR. They must manage hardware inventory, plan replacement

of obsolete devices, as well as manage budgets for technology updates. This ensures that the computer laboratory remains relevant to developments in education and technology.

Collaboration with various related parties such as teachers, administrative staff and students' parents is also part of the role of HR. They not only provide technical support, but also provide insight that is important in making strategic decisions regarding the school's technology infrastructure.

By understanding and maximizing the role of human resources in managing computer laboratories, schools can ensure that the technology not only functions as a tool, but also as a vital learning support facility. This investment in human resource development not only increases operational efficiency, but also improves student learning experiences in facing technological challenges in the current digital era (Ilyas, 2021).

Maintenance and Care

Computer laboratories in schools have a vital role in supporting the modern learning process. To ensure optimal functioning of this laboratory, regular care and maintenance is required. The following are several steps taken at MTs Muhammadiyah 2 Kedungadem, Bojonegoro to ensure the computer laboratory continues to operate well:

First, regular cleaning. Routine cleaning of hardware such as keyboards, mice, monitors and CPU units is an important basic step. Dust and dirt can interfere with device performance and shorten the life of the hardware. Using appropriate and safe cleaning tools for computer components is highly recommended.

Second, update the operating system and software. Ensuring all computers in the laboratory are running the latest versions of operating systems and application software is a crucial step. These updates not only fix bugs and security vulnerabilities but also improve device performance and compatibility.

Third, back up data regularly. Carrying out regular data backups is a must to avoid losing important information due to hardware damage or malware attacks. Backups can be stored on the school's internal servers or using a cloud solution for added security.

Fourth, temperature and humidity monitoring. Computers that operate in high temperatures and humidity can experience damage more quickly. Monitoring computer lab environmental conditions and ensuring adequate ventilation are proactive steps to extend the life of hardware.

Fifth, protection against malware attacks. Ensuring all computers are equipped with up-to-date antivirus software is important for protecting data and maintaining system stability. Additionally, teaching users (students and teachers) about digital security principles can also reduce the risk of malware attacks.

Sixth, routine maintenance by technicians. Arranging a regular maintenance schedule by an IT technician or network administrator is a wise policy. Technicians can carry out more in-depth checks on hardware and software and take preventative action before problems become more serious.

Seventh, device upgrade and replacement. Periodically, an evaluation of hardware performance is performed to determine whether any expansion or replacement is necessary. Updating certain components or replacing outdated devices can improve the overall efficiency and performance of a computer lab.

By following the steps above, schools can ensure that their computer labs function optimally to support learning and teaching. Good maintenance not only saves long-term costs but also improves productivity and user experience in the modern educational environment.

CONCLUSION

In summary, optimizing school laboratories, including both science and computer labs, involves comprehensive preparation and effective management of resources. For science labs, this means ensuring up-to-date equipment, well-trained teachers, and supportive school infrastructure. MTs Muhammadiyah 2 Kedungadem, Bojonegoro exemplifies success through strategic planning and commitment from all stakeholders.

Similarly, computer labs require robust technological infrastructure, reliable internet connectivity, and diligent cybersecurity measures. Skilled human resources play a crucial role in maintaining and integrating these technologies into the curriculum, ensuring they remain effective tools for modern education.

Regular maintenance and care are essential for both types of labs to sustain optimal functionality. Practices such as cleaning hardware, updating software, and implementing cybersecurity protocols are vital for longevity and performance. By prioritizing these elements, schools can enhance student learning experiences and prepare them for future technological challenges in the digital era.

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