

Development of Computer-Based Learning Tools and Media at Sekolah Menengah Pertama (SMP) Muhammadiyah Tanjung

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Abstract:

Knowledge and skills about computer and information technology should be taught to children from an early age. These skills are needed for continuing education to the next level. Junior high school students really need these skills to equip them to face technological developments and advances towards more sophisticated developments. To achieve this goal, adequate infrastructure is needed so that the learning process of computer and information technology can run smoothly and effectively. At present, learning about computer and information technology at SMP Muhammadiyah Tanjung has not been implemented due to the unavailability of computer equipment. Through this Program Pengabdian Masyarakat (PPM) Muhammadiyah scheme community service program, a computer room and laboratory will be gradually developed at SMP Muhammadiyah Tanjung according to the available budget for learning room and practice of computer and information technology. The method used a collaboration between Mechanical Engineering Department and SMP Muhammadiyah Tanjung, Kecamatan Muntilan, Kabupaten Magelang for the design and supply of sufficient tools. With this Muhammadiyah PPM scheme service program, it is hoped that students will be able to skillfully operate computer units and can develop skills and use information technology in a better direction. Through this service program, it is hoped that all students can experience proper educational facilities so that they are able to compete and excel both in the fields of technology and other sciences. In addition, it is hoped that the computer units provided can be used for simultaneous national assessment processes through the Ujian Nasional Berbasis Komputer (UNBK) program.

Keywords: SMP Muhammadiyah Tanjung, Ujian Nasional Berbasis Komputer (UNBK) program, Muhammadiyah PPM scheme service program, computer-based learning.

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Introduction

The implementation of national education must guarantee equity and improve the quality of education in the midst of the changing global era so that Indonesian citizens become human beings who fear God Almighty, have noble character, are intelligent, proactive, and have high competitiveness in national and international relations (Supianto, 2016). Sekolah Menengah Pertama (SMP) Muhammadiyah Tanjung (Muhammadiyah Tanjung Junior High School) is one of the secondary level educational institutions in Tanjung Village, Kecamatan Muntilan, Kabupaten Magelang. The location of Muhammadiyah Tanjung Junior High School is in the middle of a residential area and close to the main road towards Kulonprogo District and Muntilan.

Muhammadiyah Tanjung Junior High School is in a strategic location, but the existing infrastructure, equipment, and learning media is less supportive in term of student teaching and learning process. The narrow residential area, making it difficult to develop educational support infrastructure, namely the application of computer technology. The rapid development of information technology cannot be separated from the development of computer engineering. Advances in the field of computers and information technology have also had a positive impact on the education sector (Husaini, 2014). Today, technology are inseparable from education. By utilizing computer technology, some activities will be at ease practical, fast and precise (Widodo, 2013). With various current conditions, learning activities at Muhammadiyah Tanjung

Junior High School continue as usual.

The inadequate condition of the study room infrastructure is one of the reasons for the lack of motivation of Muhammadiyah residents to send their children to that school, few students attend Muhammadiyah Tanjung Junior High School. Each level only consists of 1 or 2 classrooms with an unequal number of students. Apart from that, due to the condition of the parents who generally only work as laborers and farmers, Muhammadiyah Tanjung Junior High School is it cannot decide the high cost of education varies. Under these conditions, schools are greatly assisted by the existence of reliable school operational assistance funds Bantuan Operasi Sekolah (BOS) for the implementation of education. Therefore, schools are unable to develop additional infrastructure such as materials, equipment, and media for student learning knowledge. The science teaching and learning rooms available at Tanjung Muhammadiyah Junior High School are not equipped with equipment and computer media to support the student learning process, as shown in.



Figure 1. The condition of science study room/laboratory

Through this community service program, the unused empty space at Muhammadiyah Tanjung Junior High School will be designed to become a computer and information technology learning space for students. The PPM Muhammadiyah service program will work closely with UMY Mechanical Engineering Laboratory assistant staff to design computer unit reconditioning and development.

The problem faced by UMY Mechanical Engineering Laboratory assistant staff is that the infrastructure, materials or tools that can be used for learning computer technology to students is not available. In addition, Head of Muhammadiyah Tanjung Junior High School also run the Muhammadiyah Muntlan Junior High School. With this small number of teaching staff, the need for teaching staff, classroom operators, and computer laboratory operators is very important to support student teaching and learning. However, until now, Muhammadiyah Tanjung Junior High School does not have a

laboratory room as a permanent place to study computer technology. Not only the place, the school also does not have adequate computer equipment. Muhammadiyah Tanjung Junior High School has a computer and multimedia laboratory room, but is not equipped with a computer unit for student teaching and learning, as shown in Figure 2.



Figure 2. The condition of the computer study room without computer tools and media

The development of information and communication technology continues to increase along with increasing human needs, without exception in the field of education (Tekege, 2017). Limited facilities and infrastructure as well as inadequate human resources for laboratory managers mean that laboratory functions cannot be maximally empowered to support the teaching and learning process for students. When linked to the teaching and learning process in schools, networked computer engineering laboratories can make a very valuable contribution in efforts to improve students skills and improve the quality of competency learning in the field of computer technology (Hariyanto & Bambang Sumardjoko, 2016). Apart from having limitations in managing classrooms, Muhammadiyah Junior High School also only has permanent class sections, which only have a few 8 study rooms. During the Covid-19 pandemic the study room was not maintained, as shown in Figure 3.



Figure 3. Condition of classrooms at SMP Muhammadiyah Tanjung

An alternative solution to the problems experienced by partners is the design of computer technology study rooms and computer-based learning media for students of Muhammadiyah Tanjung Junior High School. A practice room or laboratory (lab) is a mandatory requirement that schools must have to support the learning process in education (Permana, 2014). Thus, it is expected that students skills in the field of computer and information technology can be well mastered. The need for computer technology infrastructure facilities is also very much felt for the learning process during the Covid-19 pandemic conditions that have not ended. With these facilities, teachers can develop media and learning processes effectively online easily so that the learning process can be carried out. At present, this technology also plays an important role in renewing the conception of justification which was originally focused on learning solely as a presentation of various kinds of knowledge into learning as a guide so as to be able to carry out socio-cultural exploration that is rich in knowledge (Priyanto, 2009).

Method

The implementation of the PPM Muhammadiyah service program begins with observing the location for planning the next steps. Based on the data obtained, then proceed with the design stages which are carried out in collaboration with the UMY Mechanical Engineering Departement Coordinator assisted by laboratory assistants and students as technicians for operators and their development. The equipment prepared, namely the monitor unit and computer PC, roll cables, furniture fittings, and operators. Technically, the budget provided by the university will be used to procure computer hardware, then the assembly process will be carried out independently. This is done so that the available funds can be absorbed in the service program optimally.

In detail, the stages of the service process are carried out with the stages of observation, design of the service program, group discussion forums, development of learning tools and media using computer devices, implementation of the service program, and evaluation and quality control of service activities. The stages of the process are carried out so that the results obtained are in accordance with the targets and objectives that have been planned. In general, the stages of implementing the PPM Muhammadiyah service scheme can be seen in the following diagram.

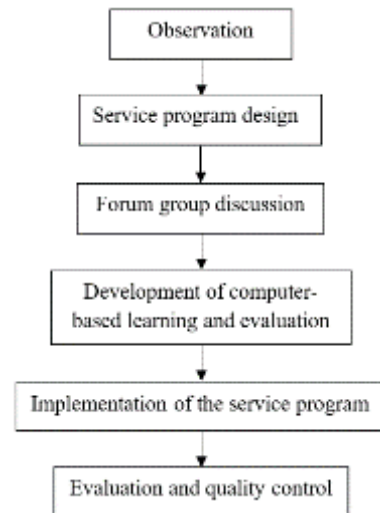


Figure 4. The service program flowchart

Results and discussions

Information and communication technology has been growing in the field of learning, as an example of use Microsoft PowerPoint in the classroom has become commonplace in teaching in the classroom (Kamelia, 2015). The design of computer equipment needed by junior high school students is only limited to recognizing and being able to operate the program office, like Microsoft Word and PowerPoint. These two skill areas really help students prepare and face life in the future which will roll into the 5.0 era so that the quality of student education can improve. Computers as learning media have enormous potential to assist the educational process. The computer as a medium in the learning process has several features that other media do not have (Saefulloh, 2007).

Aside from being a learning medium, computers are also used as media or tools for evaluating learning outcomes or known as national assessments. The national assessment is an attempt to comprehensively capture the process and quality of learning outcomes, both at the primary and secondary school levels throughout Indonesia. The information obtained is used to improve the quality of the learning process in each educational unit (Kharismawati, 2022). In the process of designing and conditioning computer units that are no longer in use, coordination is carried out with the Head of Mechanical Engineering Departement Laboratory Staff to carry out several stages so that this program can run smoothly. Some of these stages, namely collecting data on unused computer units, re-installation

process, and reconditioning computer units so that they are ready for use. In detail, the stages of designing and developing computer-based learning media for use by Muhammadiyah Tanjung Junior High School are as follows.

1. Unused Computer Unit Data Collection

The initial step taken by the Mechanical Engineering Department service team was to collect data on how many PC computer units in the form of CPUs and monitors that can still be used. After collecting data on several PC computers that can still be used, 10 PC computers (including CPU, monitor, and keyboard). Some examples of findings from PC computer data collection can be seen in Figure 5 below.



Figure 5. Data collection of unused computers

After collecting data on PC computers that are still suitable for use, all these units are collected to re-check the completeness including hardware (hardware) and software (software). From the checking results, it was found that several units needed spare parts, namely the bios battery, which had a very important influence on the operational process. In addition, monitor and CPU conditioning is also carried out to ensure that the computer unit is in good condition so that it can be directly used by students at Muhammadiyah Tanjung Junior High School.

2. Computer Unit Installation Process

The next stage of conditioning the PC computer unit is installing or setting up the system in the form of software. Each PC computer unit is reinstalled to ensure the program in that unit can run smoothly. The installation process is carried out from the most basic stages through the bios settings so that the time settings and system settings comply with applicable international standards. The next arrangement is to install basic office programs so that users (students) can directly operate office programs in general with ease. The installation process of the PC computer unit can be seen in Figure 6 below.



Figure 6. Unused PC computer installation process

3. Ready-to-Use Computer Unit Reconditioning

The final stage in the process of reconditioning the PC computer unit is testing the results of the reconditioning. The trial process is carried out by checking the operation of the office system, including Microsoft Word, Power Point, and Microsoft Excel, to run smoothly. The results of reconditioning PC computer units that can still be used can be seen in Figure 8 below. The results of reconditioning the unused PC computer unit can be used as a learning tool and media for students at Muhammadiyah Tanjung Junior High School. These computer devices can also be used as a medium for learning computer technology starting from the basic techniques of operating a computer, to its use for media presentations using Microsoft Power Point so that creativity in public speaking can be better improved. Students can also use the learning media to learn to operate the Excel program facilities for calculation purposes, both on a small and large scale, as shown in Figure 7.

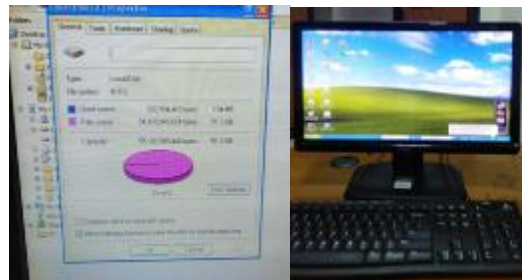


Figure 7. PC computer unit rebuild trial

Progress a nation can be measured by the quality and education system used so that the performance of educational institutions and teachers must be improved, one of which is through improving facilities and infrastructure in the education sector (Wardika et al., 2017). Not only for students, the use of computers in schools is also an example of improving the quality of institutions because with these tools a school can improve access and speed up administrative processes. Through this service program, it is hoped that all students can experience proper

educational facilities so that they are able to compete with other students who are their peers and achieve well in the fields of technology and other sciences.

4. Submission to SMP Muhammadiyah Tanjung

After the computer unit was installed according to standard conditions and programs, the computer was handed over to the Tanjung Muhammadiyah Middle School, which was symbolically accepted by the school principal, as shown in Figure 8 below.



Figure 8. Documentation of delivery of PC computer units to the Principal of Muhammadiyah Tanjung Junior High School

After being received by the Head of Muhammadiyah Tanjung Junior High School, the PC computer unit that is ready to be used for academic activities is checked first for the program used for learning media and evaluation. In carrying out the computer-based national exam (UNBK), school principals must make several preparations in the form of infrastructure strategies, human resources, and student strategies (Nurdin et al., 2021). This check was carried out by teacher staff and computer technicians at Muhammadiyah Tanjung Junior High School as shown in Figure 9 below.



Figure 9. Checking the computer program used in learning and evaluation by teacher staff and computer technicians at Muhammadiyah Tanjung Junior High School

Checking the program on the computer unit provided is carried out to ensure that the unit can be used for the final evaluation or UNBK for class IX students which is carried out simultaneously

nationally through coordination with the Magelang Regency Education Office. Even though there are still many obstacles in implementing it nationally, it is hoped that UNBK will have more positive impacts (Pernamawati et al., 2021). Through this service program, it is hoped that students of Muhammadiyah Tanjung Junior High School can use existing computer units as learning media during the educational process and can be used as media to take part in the learning evaluation process held by the government simultaneously

Conclusion

Information and communication technology in the field of education is growing. Use Microsoft Word and Microsoft PowerPoint has become commonplace in classroom teaching. The design of computer equipment needed by students, especially at the junior high school level, is only limited to recognizing and being able to operate the computer program. Muhammadiyah Tanjung Junior High School is collaborating with the UMY Mechanical Engineering Departement dedication team to develop computer learning tools and media as student learning materials. Through this service program, it is hoped that all students can experience proper educational facilities so that they are able to compete and excel both in the fields of technology and other sciences. In addition, it is hoped that the computer units provided can be used for simultaneous national assessment processes through the UNBK program.

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