

Design and Demonstration of the Use of Automatic Hand Washing Sink Technology in Covid-19 Pandemic Conditions

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Abstract:

The design of automatic hand washing technology tools to support blended learning in the COVID-19 pandemic is very much on order. In designing and demonstrating a hand washing device, an automatic faucet modification is needed which consists of an IR sensor component (Proximity Infrared Switch Sensor) as an automatic on and off switch, then to support the faucet to work with a good system, a transistor that has been modified with a modified dynamo integrated into the system. connected to a mini pump. Then the other supporting components consist of a leg rack made of elbow iron, gallons of water, a sink, a water vacuum, an adapter and a dirty water disposal bucket. Then a demonstration of the tool was carried out to students at MTs Parmiyatu Wass'adah. In demonstrating the tool there is a percentage of students with a positive response where as many as 14 students state very good with a percentage of 66.67%, and as many as 4 people state good with a presentation of 19% and as many as 3 people state quite well with a percentage of 14%. That is, the proportion of success from the design of this tool runs smoothly and can understand its functions and uses.

Keywords : Automatic hand wash, IR sensor, Electric Pump

INTRODUCTION

Education is very important to advance a human civilization today. However, in 2019 there was a disaster caused by a virus or called the covid-19 virus throughout the world (Zhong et al., 2020). The impact of this virus is very significant on the economy, health and education. The spike in cases caused by the corona virus which started in the city of Wuhan in China and has an impact on the State of Indonesia (Nurulfa et al., 2021; Aletheiani, 2021; Nursjanti et al., 2021; Marlina & Hazizah, 2020). The government has imposed restrictions on activities or new normal for almost 2 years, but the spike in exposure to COVID-19 continues to grow. This makes learning during COVID-19 forced to use online learning without face-to-face learning (Susilana et al., 2020; Churiyah & Sakdiyyah, 2020; Abidah et al., 2020). This makes the government make various efforts to achieve the effectiveness of online learning such as providing free internet packages and the use of online learning media such as zoom, cloudx, google meet and google classroom and others, which are greatly facilitated and fully supported by the government (Rulandari, 2020; Fahrurrozi et al., 2021; Wajdi et al., 2020). However, the use of technology is not without problems, there are many variances of

problems that hinder the implementation of effectiveness, one of which is that many students to students who live in remote areas, and are left behind make the internet network very slow to access or sometimes the signal is often completely dead. This makes students very overwhelmed in conducting online lectures (Zhong et al., 2020; Bestiantono et al., 2020; Dwiaryanti & Rahman, 2021). From other aspects, for example, elementary to high school students, from field findings, it was found that there was a lack of control over the use of cellphones from parents, so these students misused the use of internet packages provided by the government such as being made to play online games which resulted in a decrease in the quality of students and students. in gaining knowledge (Hidayat et al., 2020; Rachmadtullah, 2020). Parental guidance during this pandemic is highly expected because the closest control is parents so that learning can be achieved..

In addition to the lack of effective learning in the field of theory, it also has an impact on learning problems in the field of practicum where many students, especially in the vocational field, do not understand the practice in the field, which means that in the field of education, technical output skills are very necessary for their application in the industrial world (Asvial et al., 2021; Suharini et al., 2020). The development of blended learning, which is defined as hybrid learning, or known as a combination of conventional learning (offline) with online learning, is one of the best solutions in the learning conditions during the current pandemic so that the quality of education can improve. (Batubara, 2021; Syah, 2020).

In order to prevent contracting COVID-19 and support the government in accelerating face-to-face learning, one way that can be done is to get used to washing hands with soap and running water, especially when in public places (Purnama & Susanna, 2020). Not only that, keeping a distance from friends and washing hands must be considered. Based on the explanation of the problems that occurred during this pandemic, it is necessary to design automatic hand washing equipment technology, with the concept that people do not need to touch the water faucet to wash their hands so that minimizing the possibility of virus transmission is needed. The design of this tool helps students in cultivating a clean life and also diligently washing their hands. Presentation of tool components and demonstration of tools used at MTs Parmiyatu Wassa'adah.

RESEARCH METHOD

This research is focused on designing technological tools, namely hand washing equipment with a water and soap faucet design automatically and then demonstrating it for students at school to support blended learning. The design of automatic hand washing technology tools and sensors is designed to be connected to each other so that the performance of the tool can work with good usage accuracy. The technology component in the design uses a Photoelectric sensor using the principle of light reflection. when there is an object in the sensor range (about 3 to 80cm) then the sensor will detect the object in the form of a low signal in the output cable (output is NPN). The demonstration was carried out to analyze the data on the success of the automatic hand washing tool by looking at the smoothness of the water and soap when the hand was brought near the sensor with a range of about 3 to 80 cm. The demonstration was carried out as much as 1 experiment on each student, where the experiment was carried out by 21 male students

RESEARCH RESULTS AND DISCUSSION

The results that will be presented are the design of the automatic hand washing machine technology design and then describe the success of the tool by demonstrating to school students at MTs Parmiyatu Wassa'adah. The faucet design on the automatic handwashing tool used consists of an IR sensor (Proximity Infrared Switch Sensor) as an automatic switch on and off, then to support the faucet to work with a good system integrated transistors that have been modified with a motor dynamo connected to a mini pump . Then the other supporting components consist of a leg rack made of elbow iron, gallons of water, a sink, a water vacuum, an adapter and a dirty water disposal bucket. The design of the automatic hand washing tool that has been designed and carried out experiments is shown in Figure 1

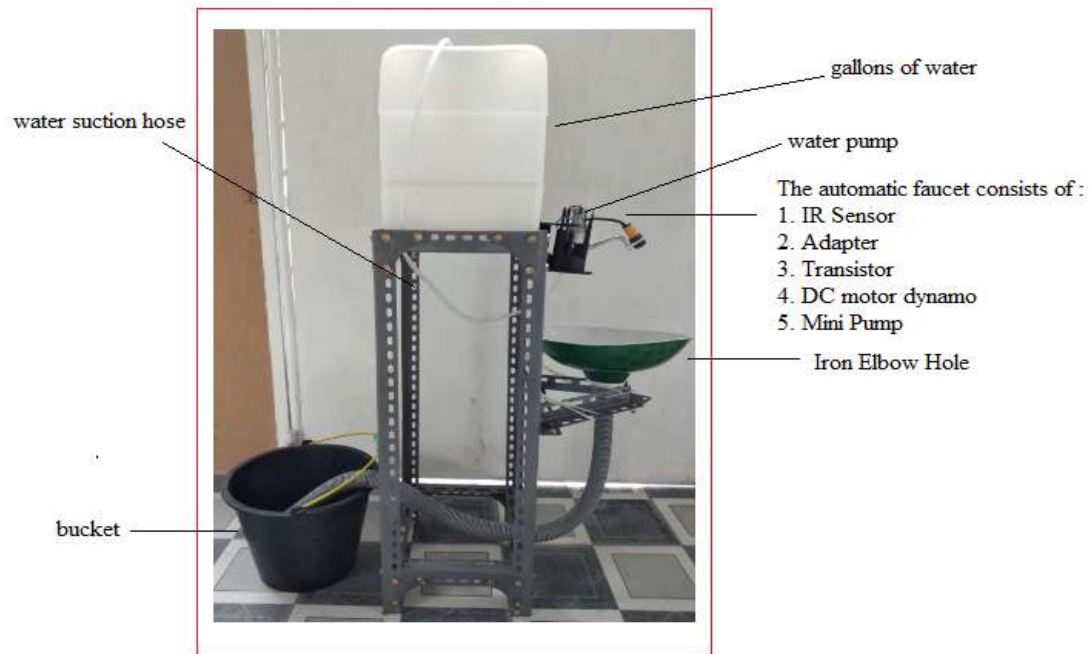


Figure 1. Automatic Hand Washing Tool

The components and sensors in the automatic hand washing technology consist of the E18-D80NK hotoelectric sensor. The electric pump is used to suck the water contained in the gallon. An electric pump that has been modified for the purpose of automatic hand washing is connected to the Adapter from an AC source. This pump is capable of pumping up to 100 liters of water per day, while hand washing is ideal for use. The transistor is designed as a switch where this component has 3 legs Collector, Emitter, and Basic. Then after the tool is finished and works with good accuracy the tool will be demonstrated to students. In explaining the automatic hand washing device, the material for using hand washing technology is preceded by the use of hand washing technology along with supporting sensors in the automatic hand washing sink technology. Then the poster explains how to wash hands properly and correctly. After everything is done then students demonstrate the tools used. The demonstration was carried out 1 time for each student, where the experiment was carried out by 21 male students according to table 1 data collection as follows:

Table 1. Experiment of Automatic Hand Washing Technology

No	Student Demonstrating Automatic Hand Wash	The success rate of Using Sensors on Water Faucets
1	Respondent 1	1
2	Respondent 2	1
3	Respondent 3	1
4	Respondent 4	1
5	Respondent 5	1
6	Respondent 6	1
7	Respondent 7	1
8	Respondent 8	1
9	Respondent 9	1
10	Respondent 10	1
11	Respondent 11	1
12	Respondent 12	1
13	Respondent 13	1
14	Respondent 14	1
15	Respondent 15	1
16	Respondent 16	1

17	Respondent 17	1
18	Respondent 18	1
19	Respondent 19	1
20	Respondent 20	1
21	Respondent 21	1

Notes: 1= fluent, 0=non fluent

The overall results show that the sensor functions properly so that the faucet can release water automatically when it is brought near to an object, namely the hand. Overall, it can be said that this automatic hand washing tool can be rated as smooth and feasible to use. Because the main focus in designing this technological tool is to prioritize in supporting blended learning learning in schools, it is necessary to have a positive response for school students in understanding the function of automatic hand washing tools which in the future can affect a clean lifestyle for students at school. Then after the students demonstrated the automatic handwashing device, a survey was carried out which was filled in by the student and then an evaluation of the results of the design of the automatic handwashing device was carried out. The form of the survey questionnaire on the demonstration of the automatic hand washing tool is in table 2.

Table 2. Survey on the Use of Automatic Hand Washing Technology and Socialization of Good and Correct Hand Washing

No	Question	Very Good	Good	Quite Good	Not Good	Very Not Good
1.	Submission of Materials and Demonstration of Tools in a Clear					
2.	The Training Manual is clearly understandable					
3.	The use of a touchless automatic hand wash is very efficient to apply in washing hands					
4.	After socializing on this activity, is it important to wash your hands properly?					
5.	In the classroom, there needs to be an automatic handwashing station					

The results of the recapitulation of the automated handwashing demonstration survey questionnaire that have been filled out by students are shown in Figure 2.

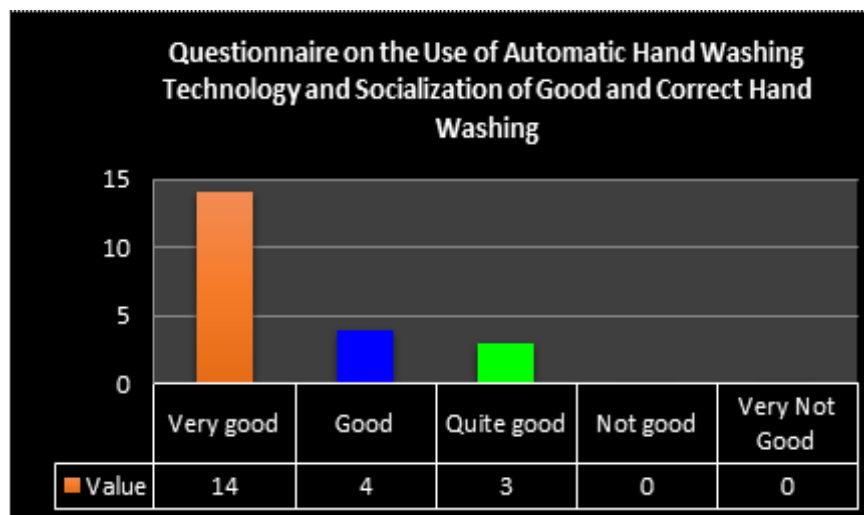


Figure 2. The results of the survey questionnaire survey results demonstration tool

Based on the results of the questionnaire calculation in Figure 2, it is obtained that the percentage of students towards the demonstration of the design of the automatic hand washing device gave a positive response where as many as 14 students stated that they were very good with a percentage of 66.67%, and as many as 4 people said they were good with a 19% presentation and as many as 3 people stated that it was quite good with a percentage of 14% meaning that the percentage of success of the design of this tool went smoothly and the functions and uses could be understood.

This is because the design of this automatic hand washing device is not only in the presentation of the design process but is implemented directly for students at school. In addition, with the provision of modules and demonstrations of the brochure on how to wash hands with soap in accordance with the guidelines from the Indonesian Ministry of Health, the students gave a positive response, which made the use and function of the design of this automatic handwashing tool more useful as a means of healthy lifestyle for people. students at school. The hope for the future is to be enthusiastic about getting used to washing hands with soap and living clean in the new normal era.

CONCLUSION

The design of the automatic hand washing device using the hotoelectric sensor E18-D80NK works very well. The process of outputting water on the faucet automatically works smoothly, this can be seen from the results of the demonstration of the tool demonstration which was carried out directly to students, so it can be concluded that this automatic hand washing tool is feasible to use and can be reproduced and disseminated for the public interest. Then based on the survey questionnaire filled out by the students, it shows that the design of this automatic hand washing device has a positive influence on increasing students' knowledge so that it can support blended learning to implement a clean and healthy lifestyle.

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