Workshop Introducing The Internet Of Things For Teachers And Students Ar Ridho Al-Qur'an Educational

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Abstract .

The scientific approach to computer technology is a support in all fields of education and at all levels of education. One of them is about the Internet of Things or what is usually called IoT. At the Al-Qur'an Education Park (TPA), computer technology knowledge and the like are a support for learning, but this knowledge cannot be directly obtained considering that there are no scientific resources such as teachers who are experts in this field, high implementation costs, concerns about security and data privacy, resistance to change, and inadequate technological infrastructure. By overcoming these challenges through the right approach and adequate support, implementing IoT in TPA can bring significant benefits in improving the quality of education and students' readiness to face an increasingly digital future. Based on these points, lecturers from the Faculty of Computer Science, Kosgoro 1957 Institute of Business and Informatics, designed Community Service activities (PKM) with the main aim of implementing the Internet of Things (IoT) in the Al-Qur'an Education Park (TPA) in order to improve the quality of education in an innovative and efficient way. By utilizing IoT, this activity is expected to make a real contribution to the transformation of education in TPA. This activity was carried out in the form of a workshop, including providing intensive workshops to teachers and students about the basics of IoT, the use of IoT devices, and other technologies related to IoT. Apart from that, there was also an outreach session for teachers and students about the benefits and importance of IoT in life. The application of IoT in TPA not only improves the quality of learning, but also has broad implications, such as empowering teachers in using technology, as well as increasing awareness of the importance of being wise in using technology. This PKM activity can also be a model for other educational institutions in adopting technology to improve the quality and effectiveness of education.

Keywords: *Internet of Things , TPA, Technology and Computer.*

I. INTRODUCTION

Internet of Things (IoT) is a concept in which various devices, such as sensors, microcontrollers, and communication networks, are connected to each other via the internet to exchange data and work together automatically. This technology allows devices to collect and transmit data, thereby increasing efficiency, security and comfort in various aspects of life, including in the education sector (Abdel-Basset et al., 2019). In an educational context, IoT can be used to create a more interactive and connected learning environment, improve school management, and open up career opportunities in technology for students (Yusuf et al., 2023). It is important for teachers to understand the Internet of Things (IoT) because this technology can significantly improve the learning process and educational management. With knowledge of IoT, teachers can integrate this technology into the curriculum to create a more interactive and dynamic learning environment, facilitate project-based learning that is relevant to the real world, and manage school resources more efficiently (Fatira et al., 2020). In addition, understanding IoT also allows teachers to prepare students for future technological developments and open up new career opportunities in this rapidly growing field.The development of the Internet of Things (IoT) is very fast and extends to many fields such as industry, health, agriculture, homes and smart cities.

5G technology increases speed and connectivity, allowing more devices to connect quickly (Prawiyogi & Anwar, 2023). In industry, IoT helps with automation and maintenance of machines, while in healthcare, IoT devices enable remote monitoring of patients. Agriculture uses IoT to increase crop yields with sensors and automated irrigation systems (Abdel-Basset et al., 2019). Smart homes leverage IoT for security and convenience, and smart cities use IoT to better manage public infrastructure. IoT device security

is becoming an important focus, and artificial intelligence is helping to better analyze IoT data, making IoT increasingly important in digital transformation (Mantik, 2022).Knowledge about the Internet of Things (IoT) among TPA (Al-Qur'an Education Park) teachers and students is very important to prepare them to face future technological developments. Understanding and integrating IoT can increase learning interactivity, management efficiency, and technological literacy. Through workshops, training and collaboration with technology experts, teachers and students can gain new insights that are relevant and practical. This not only enriches their learning experience, but also opens up new career opportunities and skills in the ever-growing digital era (Setiawan, 2018).

Introducing these concepts with real examples and practical demonstrations will help TPA teachers and students understand IoT in a way that is easy to understand and relevant to everyday life.The urgency of implementing the Internet of Things (IoT) in the context of the Al-Qur'an Education Park (TPA) emphasizes the importance of increasing technological literacy among teachers and students. Understanding IoT not only prepares them for an increasingly advanced digital era, but also opens up opportunities for innovation in education, such as more interactive and efficient teaching and better operational management. However, several issues need to be addressed, including lack of access to and knowledge of technology, high implementation costs, concerns about data security and privacy, resistance to change, and inadequate technology infrastructure. By overcoming these challenges through the right approach and adequate support, implementing IoT in TPA can bring significant benefits in improving the quality of education and students' readiness to face an increasingly digital future. Based on the points above, lecturers from the Faculty of Computer Science, Kosgoro 1957 Institute of Business and Informatics designed activities in the form of Community Service (PKM) with the above problems with the main aim of implementing the Internet of Things (IoT) in the Al-Qur' Education Park an (TPA) is to improve the quality of education in an innovative and efficient way.

By leveraging IoT, TPA can create a more interactive and adaptive learning environment, enabling more personalized and focused teaching. In addition, IoT can also be used to improve TPA operational efficiency, such as attendance management, resource use, and maintenance of learning environments. Through IoT integration, TPA can prepare students to face future challenges in the digital era, while still maintaining strong religious education values. The partners working with the PKM team this time are Taman Teachers and Santri

II. RESULTS AND DISCUSSION

On the occasion of starting the session, the resource person from the team opened material about introducing IoT to students at the Ar Ridho Al Qur'an Education Park. On this occasion, the speaker explained that the Internet of Things (IoT) is when various objects around us, such as toys, watches or lights, can be connected to the internet and communicate with each other. For example, imagine you have a smartwatch that can measure how fast you run and how many steps you take. This watch can send data to your cellphone so you can see your sports progress every day. Or the lights at home that can turn on by themselves when you say "on", because they are connected to the internet and hear your commands. With IoT, objects become “smart” and help us in many everyday things, making life easier and more enjoyable.Learning about the Internet of Things (IoT) is beneficial for children because it helps them understand how technology works and how objects around them can connect and communicate (Minarto & Deni Wahyu Permadi, 2013).

This stimulates their curiosity and creativity, encouraging them to think about new ways to use technology in everyday life. Additionally, knowledge of IoT can be a foundation for them to learn important technology and programming skills in the future. By understanding IoT, children can also be better prepared to face an increasingly digital and connected world (Mardiana et al., 2024).The next event was for the presenters to demonstrate a tool that uses the IoT concept, namely a number guessing machine. The speaker explains what equipment is needed to make a number guessing machine and how it works. The students and female students enthusiastically listened to the explanations from the presenters.

Fig 1. Introducing Internet of Things

The students were amazed and curious, which raised many questions about how this technology works. Knowledge of IoT can also stimulate their creativity, encouraging them to imagine new projects or innovative ways to use technology. By learning IoT, children not only understand the technology around them, but also become more interested and ready to face the digital world of the future. And the most eagerly awaited session is when the presenter gives a demonstration and the students can try playing with the number guessing machine.

Fig 2. Simulation of Number Guessing Machine. The one of the product Internet of Things

When trying the number guessing machine, the children were very enthusiastic and full of joy. They are repeatedly amazed when the machine successfully guesses the number they are thinking of, causing a sense of wonder and excitement. Their curiosity is sparked, making them wonder about how machines work and the technology behind them. Some children find it challenging to try to beat the machine by choosing numbers that are harder to guess, while others enjoy the experience of trying multiple times and get their friends to join in. Overall, the experience was fun and educational, increasing their appreciation for technology and sparking an interest in learning more.

Fig 3. Simulation of how IoT Robots Work

Then, as a closing event, the children gathered in a circle after trying the number guessing machine. The presenters invited them to share their experiences and feelings, sparking discussions about how the machines work and the technological wonders behind them. Several children enthusiastically told how amazed they were when the machine managed to guess the number correctly. The event ended by giving a small memento of participation to each child as a sign of appreciation for their curiosity and active participation. All the children went home feeling proud and increasingly interested in exploring the world of technology in the future.

2.2 Implementation Method

PKM activities are currently being carried out at the Ar Ridho Alqur'an Education Park, Cipedak, Jagakarsa South Jaarta with the location map as follows https://maps.app.goo.gl/x4UEV4oqEzs5TMV88 The activity was attended by 45 santri and female students accompanied by 3 (three) teachers, while from the Kosgoro Institute of Business and Informatics campus it was attended by 5 (five) lecturers and 1 (one) student. This activity will be held on Saturday, June 1 2024 at 08.00 – 09.30 am WIB. The method applied in this activity is the demonstration method of integrated learning tools.

2.1.1 Preparation Stage

Identify the Problem

The preparation stage for community service begins with identifying problems or needs that exist in the community. In this context, surveys and interviews were conducted with TPA Heads to find out their needs. The results of this process show the need to increase students' understanding of the development of information technology around the Internet of Things.

2. Goal Determination

The main aim of this program is to provide workshops in introducing the Internet of Things as a digital literacy material for the younger generation to be able to know more deeply about current and future technology.

3. Preparation of Proposals and Implementation Plans

The next stage is preparing the implementation plan contained in the Community Service proposal

2.1.2 Implementation Stage

1. Explanation of Basic Concepts:
    a. Starting with an explanation of basic concepts about the Internet of Things (IoT) in simple and easy to understand language.
    b. Provides an overview of how IoT enables devices to communicate and work automatically.
    c. Explain the relevance of IoT in everyday life and its potential applications in various fields.
2. Discussion and Understanding:
    a. Provide opportunities for students to discuss the basic concepts that have been explained.
    b. Ask students questions to ensure their understanding of IoT concepts.
    c. Encourage students to share their experiences or examples of IoT applications they know.
3. Demonstration:
    a. Conduct a live demonstration of how the "Guessing Number Game Device" works. Smart garbage and Robot Claw
    b. Explain in detail how students can use the device to guess numbers, smart garbage detects motion sensors and claw robots that can pinch objects that are read by the sensors
    c. Provides real-world examples of how the accelerometer detects movement and how tap patterns are interpreted into numbers guessed by the device.

Through these steps, students will have a better understanding of basic IoT concepts, as well as hands-on experience in using the technology in the context of fun and educational games. This will help increase their interest and understanding of technology as well as their creativity in applying new concepts learned.

2.1.3 Evaluation Stage

After the event ended, we from the team tried to evaluate the progress of this community service activity. From the results of the discussion, comments were obtained from the participants which sparked

discussions about how the machine works and the technological wonders behind it. Several children enthusiastically told how amazed they were when the machine managed to guess the number correctly. The event ended by giving a small memento of participation to each child as a sign of appreciation for their curiosity and active participation. All the children went home feeling proud and increasingly interested in exploring the world of technology in the future.

2.2 Discussion

2.2.1 Understanding about robot and the functionality of robot with Internet of Things

In this activity there are things learned, including:

a. How do robots work based on the Internet of Things to help with human needs or work
b. How robots can be created simply
c. How functional robots are and are used in everyday life
d. What will be the trend of this robot in the future?

III. CONCLUSION

Based on the results of in-depth interviews with principals, teachers, and students, the community service program (PKM) was successfully implemented, and the students of TPA Ar-Ridho learned key points about technology especially in the internet of things field. They were enthusiastic with the method and material provided. Students appreciated the innovation and modernity brought by the use of advanced technology, which enhanced their knowledge and provided them with practical learning experiences in line with current developments.

IV. ACKNOWLEDGMENTS

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