

# EMPOWERING EDUCATORS WITH 'SCRATCH': A REFLECTION ON DIGITAL LITERACY TRAINING FOR PRIMARY SCHOOL TEACHERS

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**Abstract:** This article discusses the improvement of digital literacy among elementary school teachers in Indonesia and Malaysia through a Scratch programming workshop. The training program aimed to enhance teachers' abilities to create interactive learning media while addressing challenges in integrating technology into the classroom. Qualitative data were collected through in-depth interviews with three participants, highlighting their experiences, challenges, and the impacts of the training. The findings reveal that the training significantly improved teachers' digital literacy and confidence in using Scratch. However, some challenges, such as understanding coding logic, were noted. This training also positively impacted student engagement through interactive and creative learning tools. The study emphasizes the need for ongoing support, broader training coverage, and collaboration to sustain the benefits of such programs in transforming education.

**Keywords:** digital literacy, Scratch training, teacher development, ICT in education

**Abstrak:** Artikel ini membahas peningkatan literasi digital guru sekolah dasar di Indonesia dan Malaysia melalui pelatihan pemrograman Scratch. Program pelatihan bertujuan untuk meningkatkan kemampuan guru dalam menciptakan media pembelajaran interaktif sambil mengatasi tantangan integrasi teknologi dalam pengajaran. Data kualitatif dikumpulkan melalui wawancara mendalam dengan tiga peserta, yang menyoroti pengalaman, tantangan, dan dampak pelatihan. Temuan menunjukkan bahwa pelatihan ini secara signifikan meningkatkan literasi digital dan kepercayaan diri guru dalam menggunakan Scratch. Namun, beberapa tantangan, seperti pemahaman logika pemrograman, tetap menjadi perhatian. Pelatihan ini juga berdampak positif pada keterlibatan siswa melalui alat pembelajaran yang interaktif dan kreatif. Penelitian ini menekankan pentingnya dukungan berkelanjutan, cakupan pelatihan yang lebih luas, dan kolaborasi untuk mempertahankan manfaat program ini dalam mentransformasi pendidikan.

**Kata Kunci:** literasi digital, pelatihan Scratch, pengembangan guru, TIK dalam pendidikan

## Introduction

In the digital era, digital literacy skills are an essential competency for educators, especially elementary school teachers, to create learning that is interactive and relevant to student needs. Nurlaili (2022) defines digital literacy as the ability to use technology and information from digital devices effectively and efficiently in various contexts such as academic, career, and daily life. Digital literacy not only supports teachers' creativity in delivering material, but also helps students to better understand concepts in depth through interesting and interactive media (Nurlaili, 2022; Ruswan et al., 2024).

However, teacher digital literacy in some Indonesia and Malaysia schools still faces some challenges. Data from UNESCO shows that in Southeast Asia, teachers encounter challenges when integrating technology into their teaching practices. The adoption of educational technology is not merely about substituting existing resources; instead, it involves navigating the unique infrastructure, design, content, and pedagogical demands of each tool. Additionally, different technologies are suited to supporting various types of learning (UNESCO, 2023). This may happen due to the lack of structured information and communication technology (ICT) training, so most teachers feel less confident in utilizing

modern technology in learning (Pradhana et al., 2022; Putra et al., 2021). Most of the learning media used are still conventional, which is less attractive to students who are growing up in the fast-paced digital era (Agung, 2014; Nasruddin & Miftachurohmah, 2020).

Scratch, a block-based programming application, is designed to make it easier for educators and students to understand programming concepts. The app allows users to create interactive learning media, such as animations and educational games. Research shows that Scratch training can improve teachers' technological competence as well as student motivation in learning (Al Arif et al., 2023; Khairunnisak & Niesa, 2023). For example, research by Hilyana et al. (2024) highlighting that IT-based media creation can answer the challenges of the industrial revolution 4.0 by improving teachers' digital literacy.

Furthermore, effective technology training must be oriented to local needs and have a direct impact on the learning process. Ruswan et al. (2024) emphasized the importance of using technology-based media to improve students' digital literacy and learning effectiveness.

The purpose of this community service program is to improve the digital literacy of elementary school teachers in Indonesia and Malaysia through Scratch application training and provide hands-on experience in creating interactive learning media. By identifying the impact of training on teachers through participant reflections, it is hoped that this article can uncover important findings that support the transformation of technology-based basic education in both countries.

## **Method**

### **Program Description**

The training program entitled *"Interactive Teaching with Scratch Programming Applications"* is designed to improve the digital literacy of elementary school teachers in Indonesia and Malaysia. This program takes place online through the Zoom platform from October 24, 2024 to November 7, 2024. The training included a basic introduction to the Scratch application, storyboard creation, interactive project development, as well as reflection and feedback sessions on participants' works. This approach is designed to provide conceptual understanding as well as practical skills in using Scratch for interactive learning.

### **Data Collection**

The data for this article were obtained through in-depth interviews with three trainee teachers. The interview was conducted using the following 10-question guide:

1. How was your experience during this training? What has been most memorable for you?
2. What do you think of the material provided in this training? Is it relevant to your needs as a teacher?
3. After the Scratch introduction session, to what extent are you comfortable using this app?
4. What was your experience in creating your first Scratch project?
5. What are some of the Scratch features that you have made the most use of in the project?
6. What challenges did you face when creating material with Scratch?
7. How confident are you to create a Scratch project independently after this training?
8. How does this training help improve your digital literacy?
9. How can this training improve your students' learning experience?

10. What are your suggestions for more effective training like this in the future?

### **Data Analysis**

The analysis was carried out with a thematic approach to identify the main patterns and themes of the interviews. The data was analyzed qualitatively to provide an in-depth picture of the participants' experiences, including the participants learning experience during training and the relevance of training materials to the needs of teachers. In addition, the technical challenges and how to overcome them is also explored as well as how the increase of digital literacy impacts on their teaching process.

### **Results and Discussion**

Scratch training has a significant impact on improving teachers' digital literacy. To understand further, in-depth interviews were conducted with three teachers of the trainees. This chapter discusses the results of the interviews and an in-depth analysis of the experiences, challenges, and benefits felt by the participants.

### **Results**

Based on in-depth interviews with three teacher trainees, several important findings were found that show the impact of training on improving their digital literacy. Here is an analysis based on the answers to 10 interview questions.

### **Experience During Training**

The three teachers revealed that this training provided a memorable experience. Teacher 1 highlighted that learning to code is challenging but exciting. Teacher 2 found the Scratch practice session to provide a real picture of its use in teaching, while Teacher 3 felt that this training opened up new insights that could be applied in the future. The experience shows that the training has succeeded in having a positive impact in introducing new technology to participants.

### **Relevance of Materials to Teachers' Needs**

The training material is considered relevant to the needs of participants as teachers. Teacher 1 emphasized that diverse learning media can increase student enthusiasm. Teacher 2 and Teacher 3 mentioned that the material provided was quite easy to understand and in accordance with their teaching needs. This relevance is essential to ensure that technologies like Scratch can be implemented effectively in the classroom.

### **Convenience in Using Scratch**

In terms of comfort, Teacher 1 felt quite comfortable using Scratch without any significant problems, while Teacher 2 felt that he needed to adapt further because Scratch was still new to teachers. Teacher 3 revealed the need for additional practice to understand the app's features. This shows that while training provides a good foundation, continued support is needed to increase teachers' confidence.

### **Experience Creating a Scratch Project**

The three teachers faced challenges while creating their first Scratch project. Teacher 1 found the process quite difficult, Teacher 2 felt challenged but finally understood, and Teacher 3 found the Scratch feature to become clearer after trying several times. This experience reflects the need for intensive mentoring during the early stages of implementing new technologies.

**Features Leveraged**

Teacher 1 uses the feature to create questions, while Teacher 2 and Teacher 3 more often use the voice and costume features to make the project more interesting. The preference for features demonstrates Scratch's flexibility in supporting a wide range of learning needs.

**Challenges Faced**

Key challenges include understanding coding (Teacher 1), integrating learning ideas with coding logic (Teacher 2), and ensuring features work according to the flow (Teacher 3). This challenge highlights the need for a training strategy that is more focused on practical application and problem-solving.

**Confidence in Creating Independent Projects**

Teacher 1 and Teacher 3 felt confident enough to create an independent project, while Teacher 2 admitted that this confidence grew as the training process progressed. This shows that the training is able to gradually increase teachers' confidence.

**Increasing Digital Literacy**

The three teachers agreed that this training helps improve their digital literacy. Teacher 1 highlighted the ability to modify questions and games, Teacher 2 understood how digital projects work, and Teacher 3 saw the potential of technology in learning. This increase is an indicator of the success of the program.

**Impact on Student Learning Experience**

Teacher 1 reported that students felt happy and interested when using Scratch-based media. Teacher 2 mentioned that Scratch as an innovative medium provides a new learning experience for students. Teacher 3 added that animation and educational games make learning more fun. This impact underscores the benefits of technology in increasing student engagement.

**Suggestions for Future Training**

Teacher 1 proposed more similar training to improve teacher competence. Teacher 2 suggested the establishment of a discussion forum to share experiences, while Teacher 3 emphasized the importance of direct mentoring. These suggestions provide valuable input to improve future training.

**Discussion**

The Scratch training conducted for elementary school teachers in Indonesia and Malaysia showed significant results in improving participants' digital literacy and technology competence. The results of interviews with three teachers of the trainees revealed that this training provided valuable experience, although it was accompanied by technical challenges.

This training can be said to directly improve the participants' digital literacy, as revealed by Teacher 1 who felt more confident in modifying questions and games using Scratch. This finding is consistent with Nurlaili (2022), who stated that digital literacy supports creativity in delivering material. In addition, Ruswan et al. (2024) emphasized that the use of technology in learning media can improve students' digital skills and motivation, which was also felt by Teacher 3 in their experience using Scratch-based animation.

Scratch as a learning tool has helped teachers create more engaging and interactive media. Guru 2 mentioned that features such as sounds and costumes are very useful in creating projects. Rio et al. (2024) identified that Scratch allows users to understand the basics of programming through story creation and animation, which contributes to the development of creative thinking logic. In addition, Wulandari et al. (2021) highlighted that Scratch can improve computational thinking skills in students, making learning more relevant to the needs of the digital era.

While it provides many benefits, the training also presents challenges, especially in understanding programming logic and integrating learning ideas into Scratch projects. Teacher 1 and Teacher 2 mentioned that coding is the main obstacle. This is in line with the findings by Putra et al. (2021), which revealed that teachers who are not familiar with ICT technology tend to have difficulties in developing technology-based learning media. Therefore, a more practical and targeted training approach is needed, as suggested by Al Arif et al. (2023).

The implementation of Scratch in learning creates a more engaging learning experience for students. Teacher 3 reported that students felt more interested when using animations and educational games created with Scratch. This is in line with Nasruddin and Miftachurohmah (2020), who stated that ICT-based learning can stimulate students' interest and motivation and increase the attractiveness of learning. In addition, Sholeh et al. (2022) found that Scratch is able to foster students' creativity in understanding the concept of programming logic.

Participating teachers suggested increasing the scope of training, including discussion forums and live mentoring, to support a more effective implementation of Scratch. This suggestion is relevant to research by Hilyana et al. (2024), which states that technology-based training must be accompanied by consistent mentoring so that teachers are better prepared to face the challenges of the industrial revolution 4.0. Improving access and technology facilities in schools is also important to ensure the sustainability of the program (Puspitasari & Rubiyanto, 2024).

Overall, this training supports global efforts to improve digital literacy as one of the 21st century competencies. Digital literacy allows teachers and students to not only access technology but also use it productively in learning (Budiarti et al., 2022; Pradhana et al., 2022). Thus, this training program is a strategic step in supporting the transformation of technology-based education in Indonesia and Malaysia.

## **Conclusion**

This training has succeeded in improving teachers' digital literacy, especially in understanding and using the Scratch application to create interactive learning media. Participants gained new insights into how technology can be applied in a teaching context to improve student engagement. The implementation of Scratch in the classroom shows that students are more interested and motivated in learning. Animation-based learning media and educational games developed by participants provide a different and fun learning experience.

Although this training was successful, some participants faced challenges such as understanding coding and applying coding logic to the learning material. This challenge demonstrates the importance of further mentoring and additional training.

## **Suggestion**

In conducting training program, it is recommended to provide continuous assistance for participants, both through online discussion forums and additional training sessions, so that they are more confident in using Scratch independently. Future training

could include more participants and expand the scope of the material, such as the integration of Scratch with specific subjects or the development of collaborative projects between teachers.

Collaboration between educational institutions, such as universities and schools, needs to be improved to expand the impact of training programs. This cooperation can include the development of training modules, the provision of resources, and the development of policies that support technology in education.

Finally, support from schools is needed to provide adequate facilities, such as computer equipment and internet access, so that teachers can more easily implement the results of training in daily teaching.

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