

BAB I

PENDAHULUAN

1.1 Project Background

The era of digital revolution and technological disruption is another term for this industry 4.0. Known as the digital revolution because of the spread of computers and automation of records in various fields. Industry 4.0 is said to be the era of technological disruption because automation and connectivity in one area will make the world spin and industrial and job competition become non-linear. The phenomenon of sophistication that occurs in the digital era explains that all information and convenience have become a lifestyle for today's humans, (Trisyanti & Prasetyo, 2018). The convenience offered provides opportunities for anyone who needs and wants it. In education, this has a positive impact that can be felt by educators and students. Furthermore, according to (Citraningsih & Wiranata, 2022) learning using digital can explore the ability to utilize digital. For example, currently teaching and learning activities can be carried out anywhere and anytime as long as the location provides internet and a stable signal, then teaching and learning can be carried out.

1.2 Problem Statement

The following is the problem formulation based on the background of this research:

- a. What are the factors contributing to the ineffectiveness of traditional learning media, such as books, drawing cards, and magazines, in early childhood education in rural settings?
- b. What difficulties do kindergarten students at PAUD Alamanda 105, Jumerto Village, Patrang District, Jember Regency, face in recognizing animals around them?
- c. How can artificial intelligence technology, specifically an animal classification application based on Convolutional Neural Network (CNN)

with the DenseNet-121 architecture, be utilized to develop effective learning media to address kindergarten students' difficulties in identifying animals?

1.3 Project Objectives

The main objective of this project is to enhance inadequate learning media in Indonesia through Design and Development of an AI-Based Animal Classification App for Early Childhood Education at PAUD Alamanda 105, Jumerto Village, Patrang District, Jember Regency, East Java Province, Indonesia. The sub-objective that support this main objective are.

- a. To investigate ineffectiveness in learning using traditional media such as book, drawing card, magazine and etc.
- b. To identify kindergarten Students' difficulties in knowing animals around them.
- c. To develop learning media for kindergarten Students' difficulties in identifying animals around them by using AI Technology which is application for animal classification.

1.4 Benefits of research

This research benefits early childhood education in rural areas by providing an interactive tool that enables teachers to introduce animals visually and accurately. Using the DenseNet-121 architecture, the classification process becomes fast, precise, and accessible offline, making it effective in areas with limited connectivity. In addition to assisting teachers, this research also supports safe digital literacy for children through guided use. In the future, the system can be further developed by expanding the dataset, adapting the model for local animals, and adding interactive features such as audio.

1.5 Scope of problem

This research has the following limitations:

1. Teachers and students share the same access to the dashboard, allowing them to predict animals using images from the gallery or by taking photos, including toys or figures. They can also play animal name sounds in Indonesian or English.

2. Administrators manage the database, maintain its security, and ensure only authorized access is allowed.
3. Administrators handle problem resolution and provide user training for application usage.
4. The system contains only 33 animal classes, covering common animals such as cats, dogs, and others.
5. The website features a child-friendly design with bright colors, animal images, and cute buttons, plus bilingual audio for animal names and image selection from gallery or camera.