ABSTRAK

Alex Volintino Hutagaol, NIM: 6203210029, " Pengembangan Lampu Reaksi *Light Control Agility* Menggunakan *Arduino* dan *Android Bluetooth* Untuk Melatih Kelincahan Anak Didik Akademi Basket Medan (ABM)". Pembimbing: Zulaini. Skripsi: Fakultas Ilmu Keolahragaan UNIMED 2025

Penelitian ini bertujuan untuk mengembangkan dan menguji kelayakan alat bantu latihan "Lampu Reaksi *Light control agility*" berbasis *Arduino* dan *Android Bluetooth* guna meningkatkan kelincahan atlet di Akademi Basket Medan (ABM). Latar belakang penelitian ini adalah adanya permasalahan berupa kelambatan gerak dan kurangnya kelincahan pada atlet junior ABM, khususnya dalam teknik *dribbling*, serta minimnya variasi latihan dan pemanfaatan teknologi dalam proses pelatihan. Metode penelitian yang digunakan adalah *Research and Development* (R&D) yang disederhanakan menjadi delapan tahapan, dengan pengumpulan data melalui observasi dan wawancara tidak terstruktur bersama pelatih dan atlet. Desain produk mencakup sistem lampu reaksi yang dikendalikan melalui aplikasi *Android* menggunakan koneksi *Bluetooth*, serta dilengkapi dengan lampu LED, sensor jarak HC-SR04, *buzzer alarm*, dan layar LCD. Alat ini dirancang untuk memberikan stimulus visual secara acak yang memerlukan respons cepat dari atlet saat melakukan *dribbling*, serta memungkinkan pemantauan dan evaluasi kinerja secara *real-time*. Hasil validasi menunjukkan bahwa alat ini sangat layak digunakan, dengan penilaian ahli media yang meningkat dari 88% menjadi 96% (kategori "Sangat Baik") dan penilaian ahli materi yang meningkat dari 91% menjadi 98% (kategori "Sangat Baik"). Selain itu, pelatih dari SMA Budi Murni II memberikan penilaian rata-rata sebesar 96% pada skala kecil, pelatih dari ABM memberikan penilaian rata-rata sebesar 96% pada skala besar yang menunjukkan bahwa alat ini sangat membantu dan memberikan variasi dalam latihan. Uji coba kelompok besar terhadap atlet ABM Medan juga menunjukkan hasil sangat baik dengan tingkat kelayakan sebesar 100%. Dengan demikian, dapat disimpulkan bahwa alat "Lampu Reaksi *Light control agility*" yang dikembangkan sangat layak digunakan dalam kegiatan latihan olahraga, khususnya bola basket, untuk meningkatkan kelincahan dan reaksi atlet.

Kata Kunci: Lampu Reaksi, *Arduino*, *Bluetooth*, Kelincahan, Bola Basket.

ABSTRACT

Alex Volintino Hutagaol, Student ID: 6203210029, "Development of the Light control agility Reaction Lamp Using Arduino and Android Bluetooth to Train the Agility of Students at Medan Basketball Academy (ABM)." Supervisor: Zulaini. Thesis: Faculty of Sports Science, State University of Medan (UNIMED), 2025.

This research aims to develop and assess the feasibility of a training aid called the "Light control agility Reaction Lamp" based on Arduino and Android Bluetooth technology, designed to improve the agility of athletes at the Medan Basketball Academy (ABM). The background of this study is the issue of delayed movements and lack of agility among junior ABM athletes, particularly in dribbling techniques, as well as the limited variety of training methods and lack of technological integration in the training process. The research method employed is a simplified version of Research and Development (R&D), consisting of eight stages, with data collected through observations and unstructured interviews with coaches and athletes. The product design features a reaction light system controlled via an Android application using Bluetooth connectivity, equipped with LED lights, an HC-SR04 distance sensor, a buzzer alarm, and an LCD screen. This tool is designed to provide random visual stimuli that require quick responses from athletes while dribbling and allows for real-time performance monitoring and evaluation. Validation results show that the device is highly feasible for use, with media expert assessments increasing from 88% to 96% ("Excellent" category) and material expert assessments rising from 91% to 98% ("Excellent" category). In addition, a coach from Budi Murni II Senior High School gave an average rating of 96% on a small-scale trial, while ABM coaches also rated it 96% on a large-scale trial, indicating that the tool is highly beneficial and adds variety to training. Large group trials with ABM Medan athletes also yielded excellent results with a feasibility score of 100%. Therefore, it can be concluded that the "Light control agility Reaction Lamp" is highly suitable for use in sports training activities, particularly in basketball, to enhance athletes' agility and reaction time.

Keywords: *Reaction Lamp, Arduino, Bluetooth, Agility, Basketball.*