INTEGRATION AND UTILIZATION OF AI TOOLS IN TEACHER TRAINING AT BBPPMPV BMTI

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• BBPPMPV BMTI is a government institution in Indonesia focused on the development and improvement of vocational education and training in the field of technology and industry. Its main objectives include:

- Improving the Quality of Vocational Education
- TVET Teacher Training
- Curriculum Development
- Quality Assurance and Accreditation
- Industry Collaboration
- Research and Innovation

BBPPMPV BMTI

PRESENTATION MATERIAL

1. **The use of AI in vocational teacher training to improve teaching quality**
2. Overview of three AI - driven projects from 2020 to 2023
3. Objective: Enhancing learning methods and training effectiven

OVERVIEW OF AI INTEGRATION IN VOCATIONAL TEACHER TRAINING

Artificial Intelligence (AI) has been integrated into vocational teacher training at BBPPMPV BMTI to enhance teaching methodologies and improve the learning experience for both teachers and students. AI applications have been utilized in various fields, including maritime simulation, educational game development, and augmented reality-based training tools. These technologies enable vocational teachers to adopt modern, innovative teaching approaches that enhance their instructional capabilities and make learning more engaging. By incorporating AI-driven tools, vocational education in Indonesia has experienced a transformation, allowing for practical, interactive, and immersive learning environments that better prepare teachers and students for industry demands.

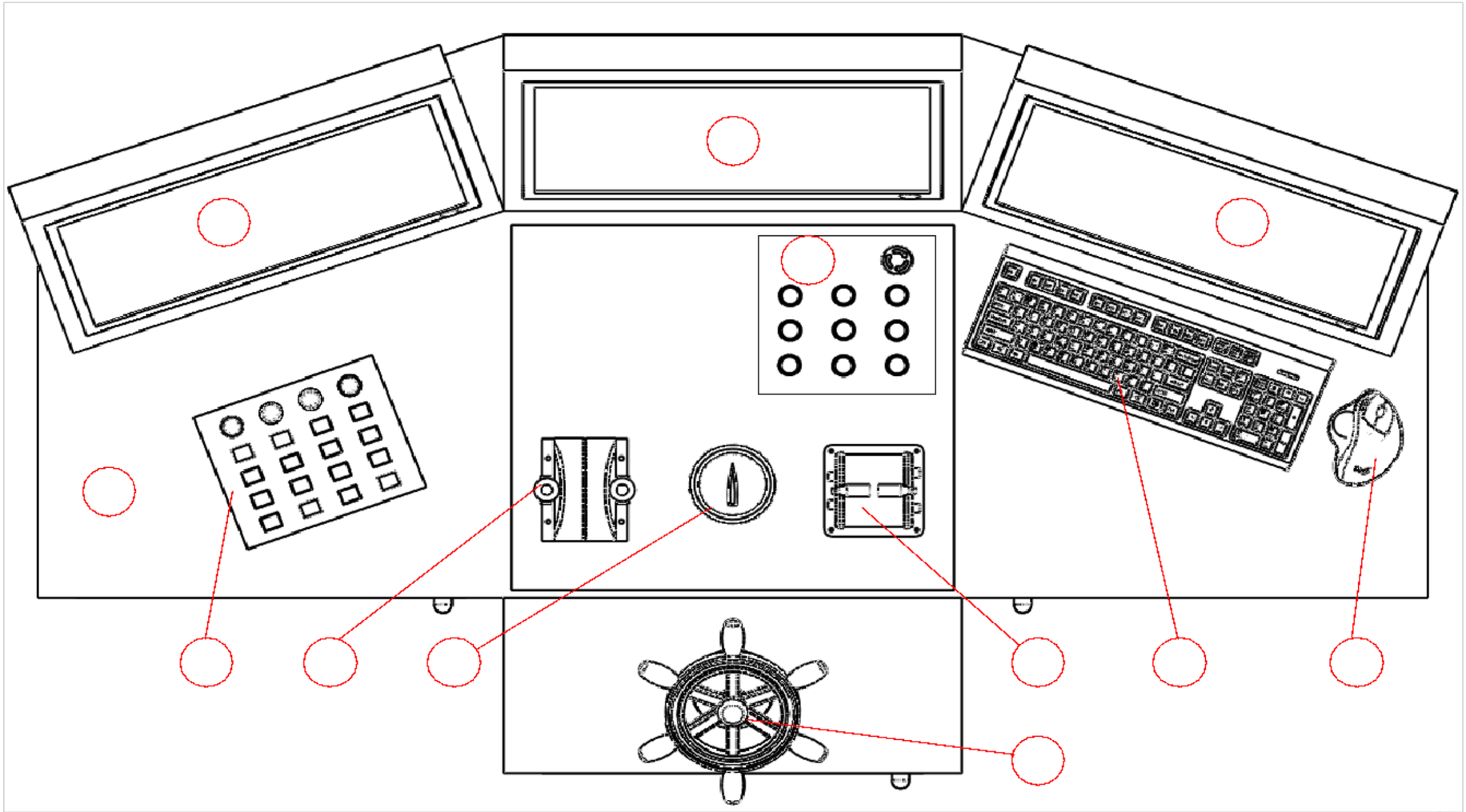
AI IN SHIP SIMULATOR

- Purpose : Practical learning tool for maritime vocational schools
- Features :
  - Auto Pilot for autonomous navigation
  - Radar ARPA for real-time tracking and collision prevention
- Impact: Real-world navigation experience for students

SHIP SIMULATOR

SHIP SIMULATOR TYPE 1 (180 Degrees) AND TYPE 2 (90 DEGREES)

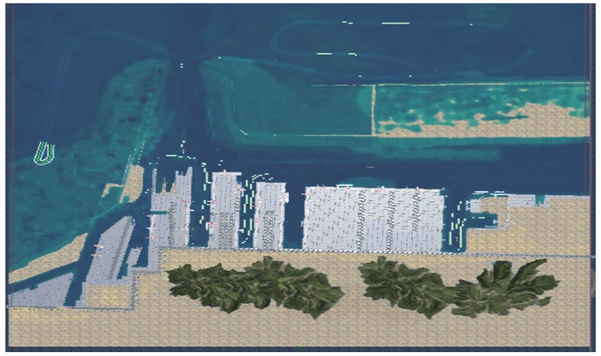
Ship Steering Control Layout

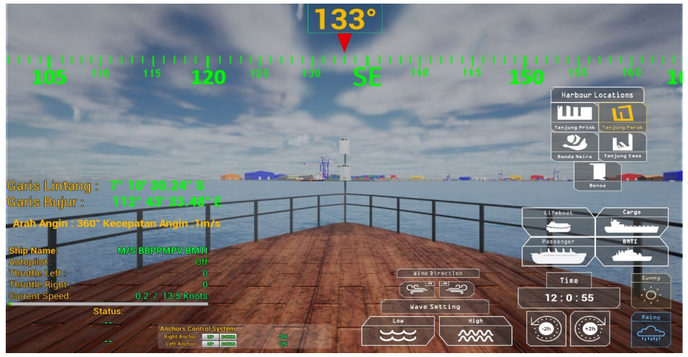


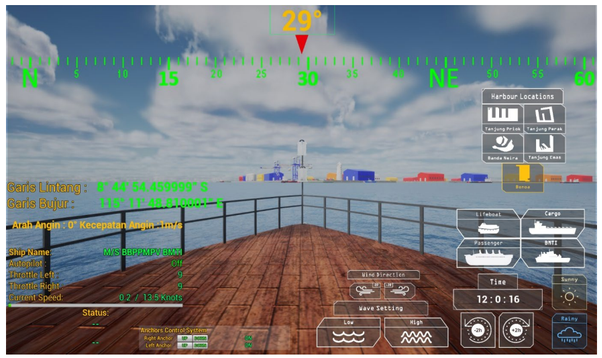
FEATURES

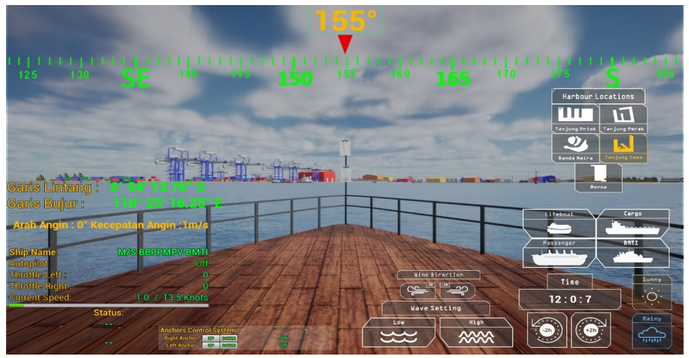
- Uses a marine environment based on coordinates from maps of several port in Indonesia such as Tanjung Priok, Tanjung Emas, Tanjung Perak, Banda Neira, and Benoa.
- 3D modeling of the marine environment, ships, cranes, lighthouses, and port atmosphere.
- Four types of ships: cargo ship, passenger ship, BMTI ship, and lifeboat.
- Includes target ships.
- Connected via a network between the ship's control room and the instructor's room.
- Time settings for day, night, and weather conditions such as rain, controlled by the instructor.
- User interaction through throttle, steering wheel, and several navigation buttons similar to those on real ships.
- Ship speed control using the throttle.
- Features include sonar, radar, time display, latitude and longitude lines, compass, and engine data.

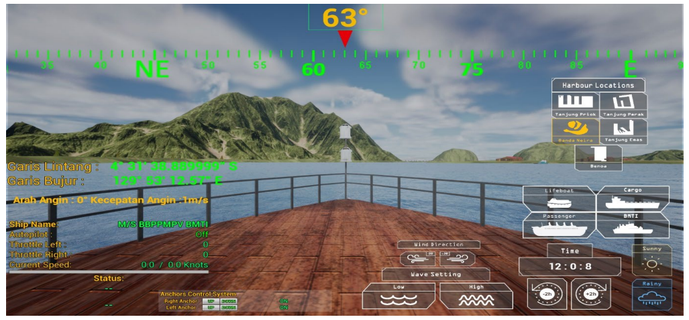
PORTS MAP USED IN SIMULATOR







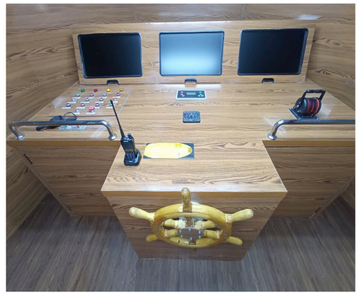




The marine environment coordinates align with the map coordinates of several Indonesian ports, such as Tanjung Priok Port, Tanjung Perak Port, Tanjung Emas Port, Benoa Port and Banda Naira Port

SHIP SIMULATOR FEATURES

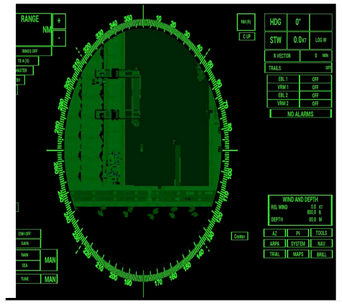
USER INTERACTION



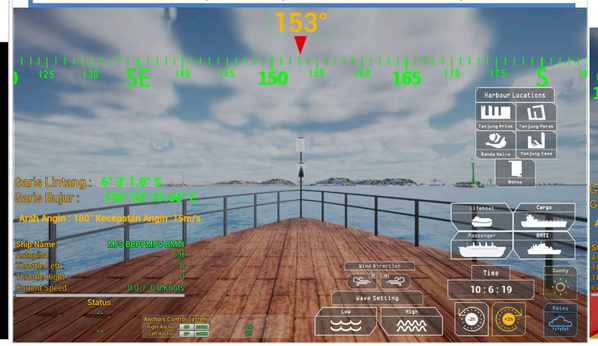
LAMP ON	LAMP AMPLI	LAMP SHIP	LAMP AP
LOCK ON SISTEM	LOCK AMPLI	LOCK LAMP SHIP	PUSH AUTOPILOT
PUSH HORN	LOCK PC 1	LOCK PC 2	LOCK PC 3
LOCK MONITOR 1	LOCK MONITOR 2	LOCK MONITOR 3	LOCK TV
	PUSH VIEW	LOCK EMERGENCY	

SONAR AND RADAR

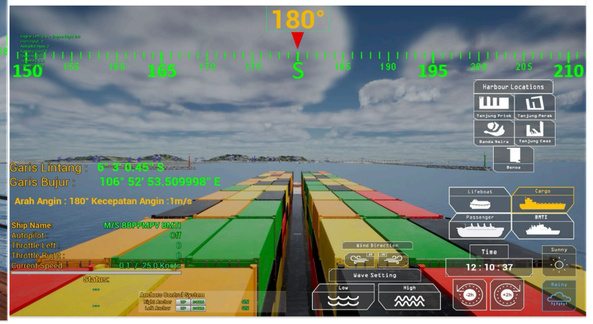
RADAR



COMPASS, TIME, DATA ENGINE, GPS



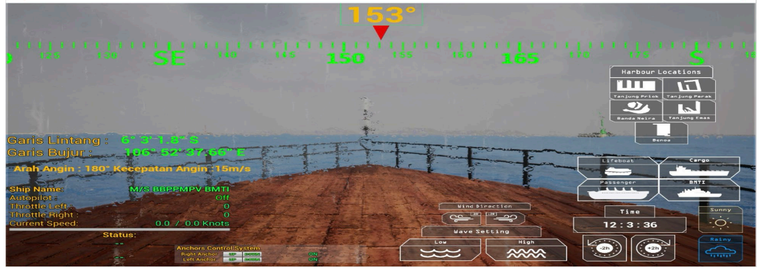
TIME AND WEATHER SETTINGS



Clear Weather In The Afternoon At Tanjung Priok Port

Clear Weather At Night At Tanjung Priok Port

Rainy Weather In The Afternoon At Tanjung Priok Port



BEHIND THE SCREEN

AI IN EDUCATIONAL GAME DEVELOPMENT

01

Purpose

- Training tool for vocational school teachers major in Software & Game Development

02

Features

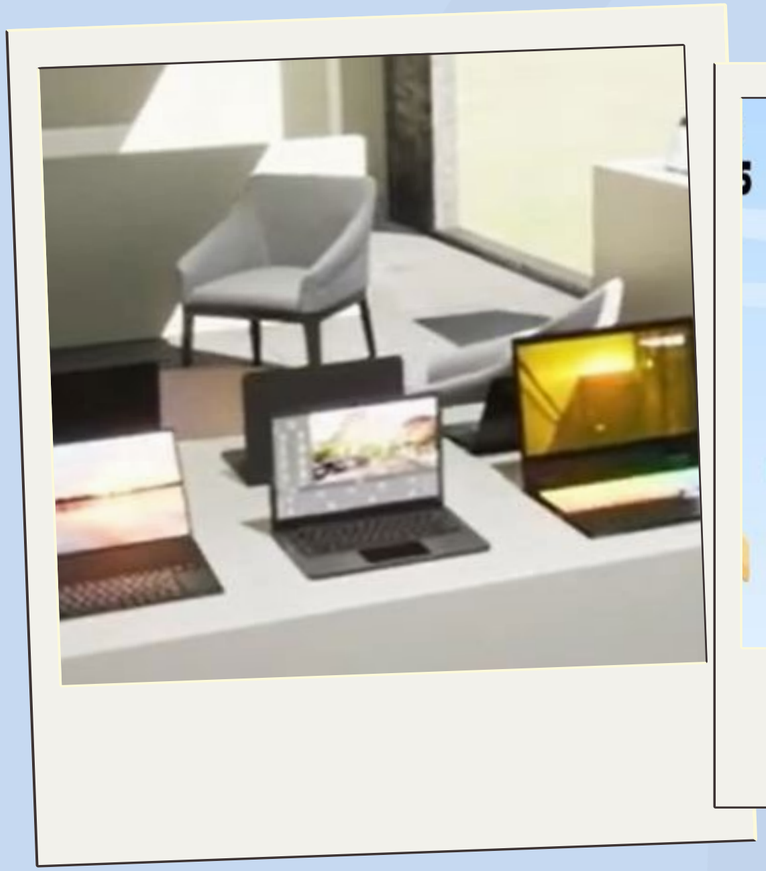
- 2D, 3D, and Virtual Reality (VR) games
- AI- driven adaptive gameplay based on subject matter

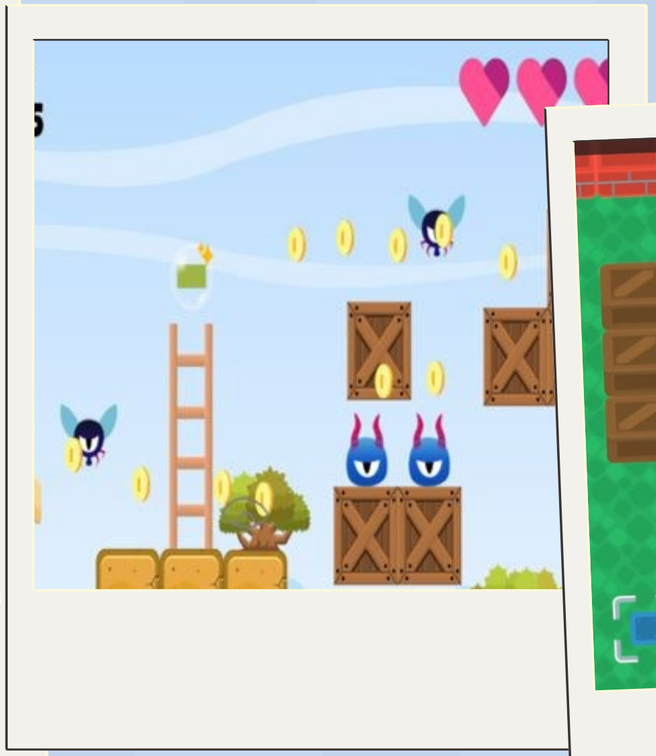
03

Impact

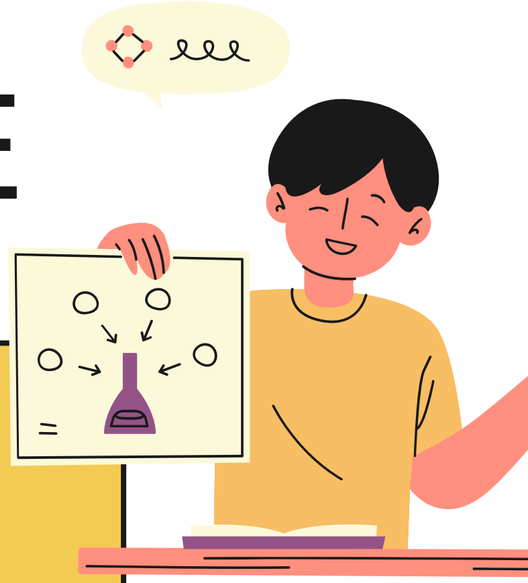
Enhanced understanding of gamification in education

EDUCATION GAME





AI IN EDUCATION GAME



These educational games include 2D games, 3D games, and Virtual Reality games, featuring various genres. They consist of multiple levels, each with different gameplay designed to achieve specific learning goals based on the subject matter. AI technology in these educational games is integrated into the gameplay according to the level and respective genre. The games are adapted to various vocational subjects taught by vocational teachers in Indonesia. This development aims to help vocational teachers better understand and apply gamification techniques in their daily classes, fostering a more engaging learning environment for students.

BEHIND THE SCREEN

AI IN AR-BASED WELDING SIMULATOR

01

Purpose:
Safe and immersive welding training environment

02

Features:

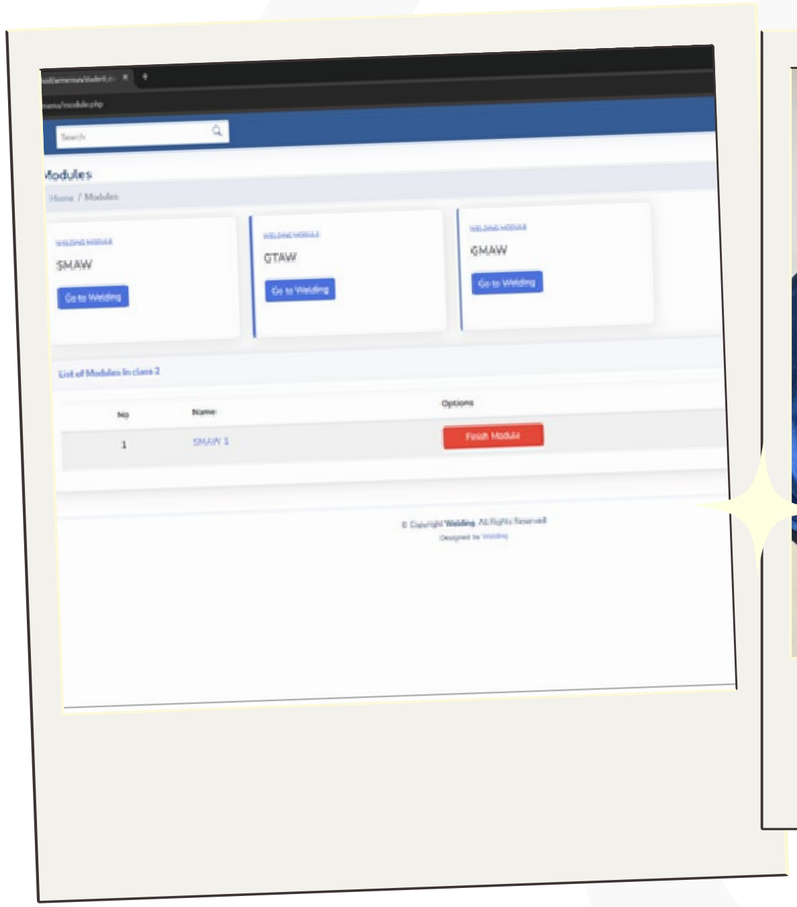
- Learning Management System
- AI- driven error detection and real - time video feedback

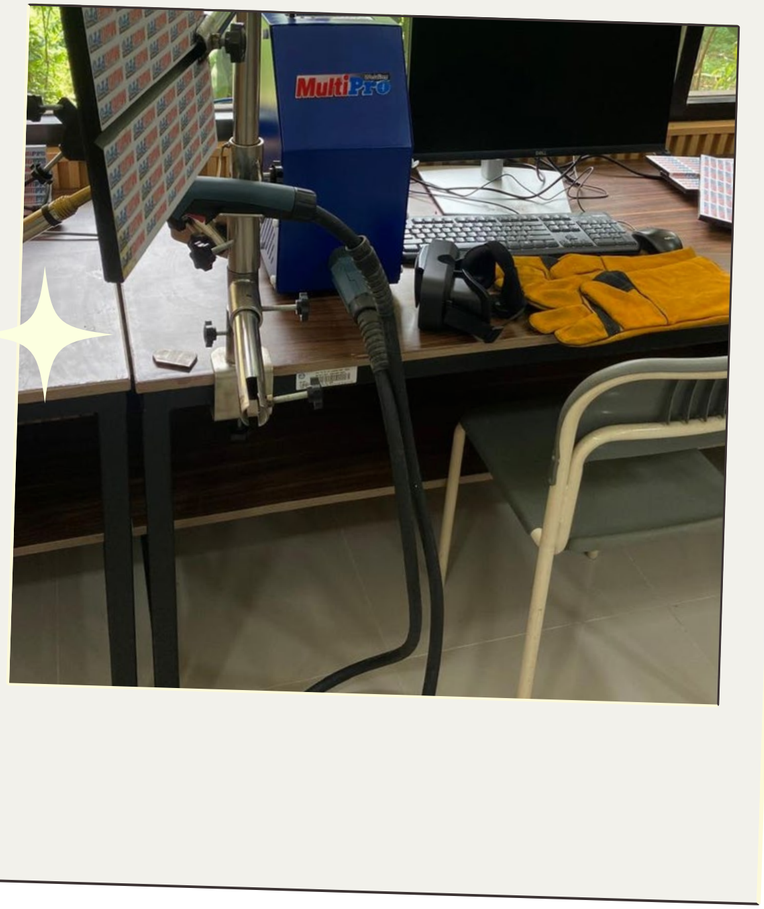
03

Impact:

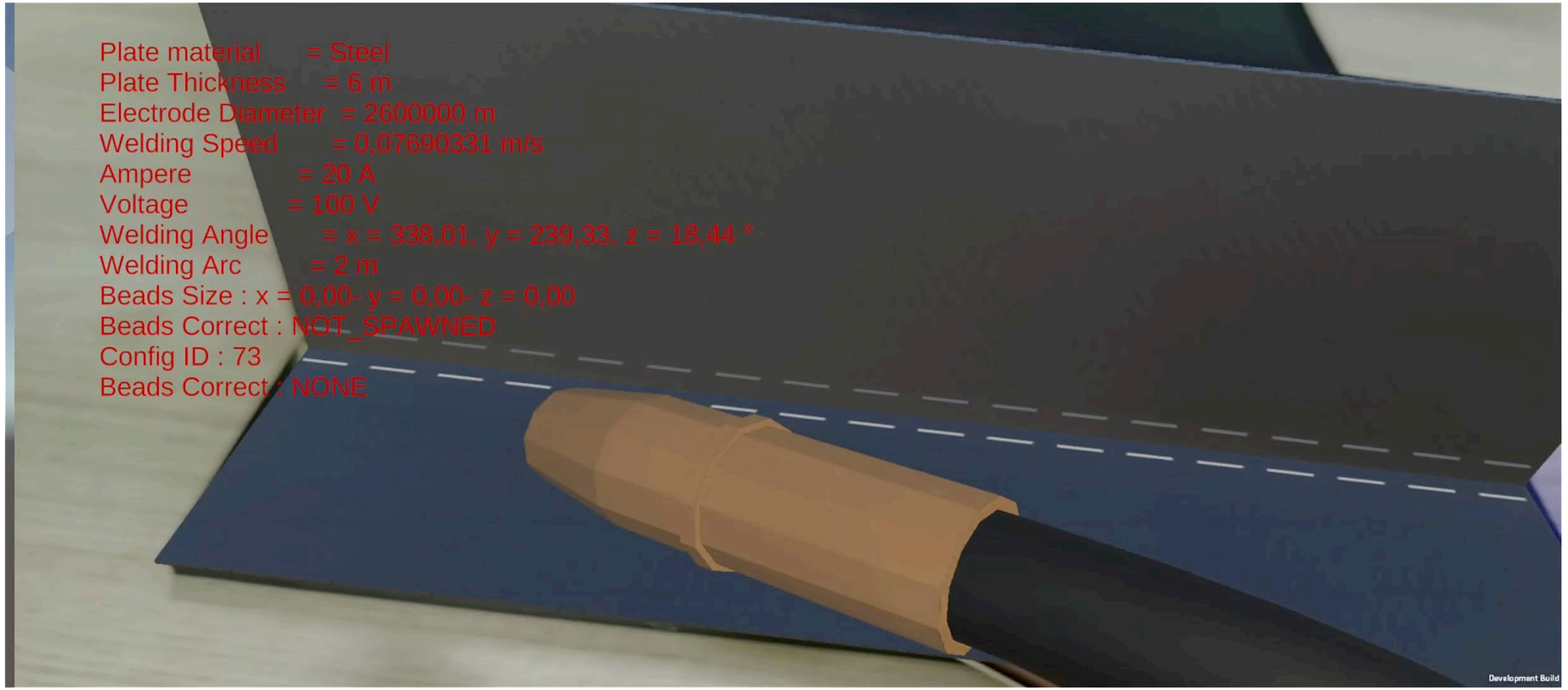
Improved welding skills with interactive feedback

WELDING SIMULATOR

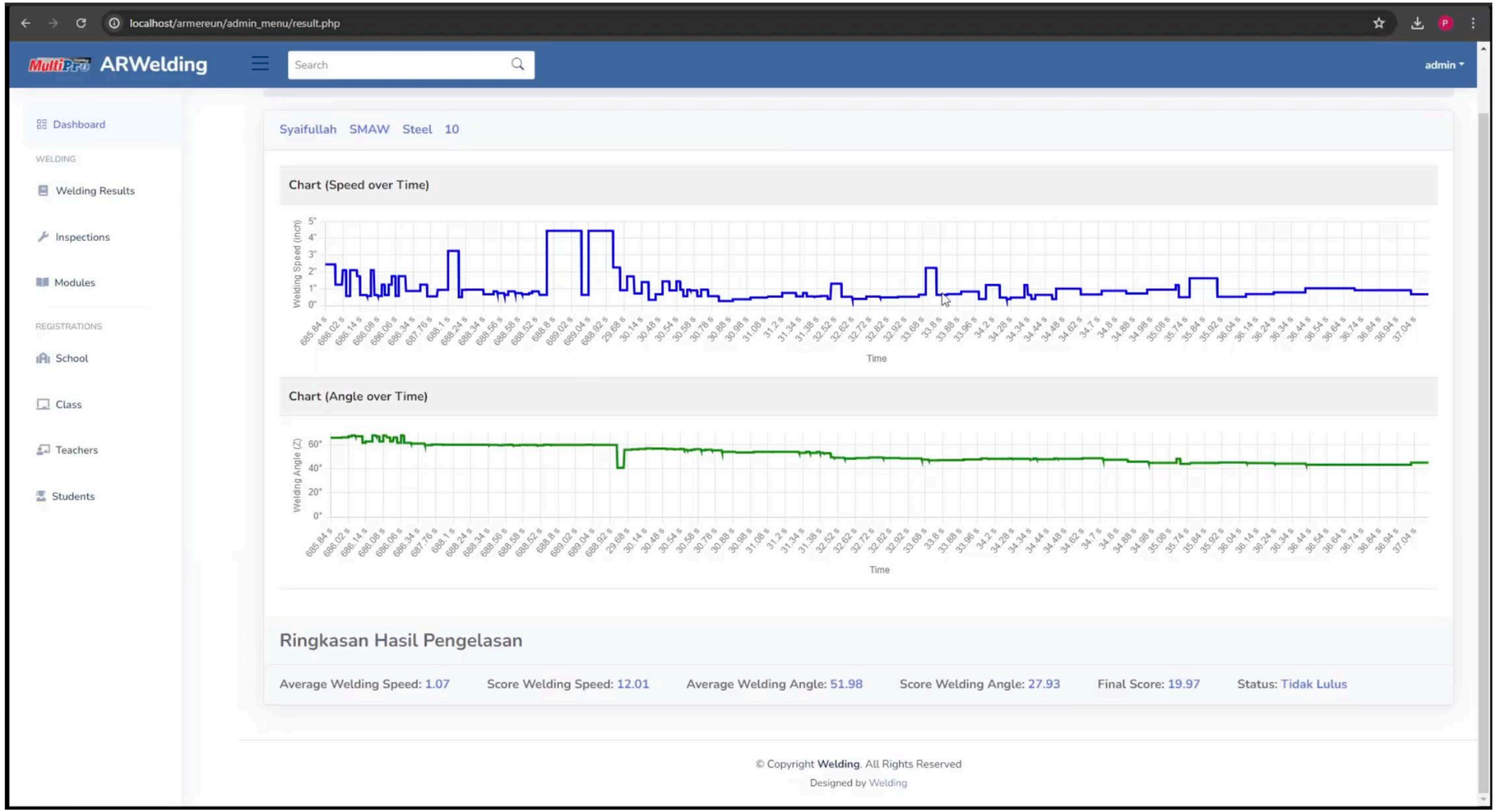




EXAMPLE VIDEO



EXAMPLE OF PRACTICAL EVALUATION



OVERALL IMPACT OF AI INTEGRATION

01. Enhancing vocational teacher skills

02. Providing immersive and practical training experiences

03. Preparing teachers for modernized vocational education

CONCLUSION & FUTURE DIRECTIONS

- Artificial Intelligence (AI) has the potential to revolutionize vocational education by providing innovative, immersive, and interactive learning experiences . Its integration enhances the teaching and training process, equipping vocational teachers with advanced tools to improve educational outcomes .
- To further advance AI adoption in vocational training, it is recommended that institutions continue integrating AI-driven technologies into their curricula . This includes expanding the use of AI-powered simulations, adaptive learning platforms, and intelligent assessment tools to enhance hands-on training .
- As a call to action, vocational training institutions are encouraged to embrace AI-based education to modernize their teaching methods and better prepare students for the evolving demands of the workforce . Collaboration with industry partners and continuous AI development will ensure sustainable and impactful training solutions .

THANK YOU