I.J. Information Engineering and Electronic Business, **2026, 1, 145-158**
Published Online on February 8, 2026 by MECS Press (http://www.mecs-press.org/)
DOI: 10.5815/ijieeb.2026.01.09

Insan AI: Integrated Artificial Intelligence Learning Platform

Winanti*
Universitas Insan Pembangunan Indonesia, Jl. Raya Serang KM 10, 15810, Tangerang, Indonesia
Email: winanti13@gmail.com
ORCID iD: https://orcid.org/0000-0002-3087-9357
*Corresponding Author

Yoga Prihastomo
Universitas Insan Pembangunan Indonesia, Jl. Raya Serang KM 10, 15810, Tangerang, Indonesia
E-mail: yoga2019@ipem.ac.id
ORCID iD: https://orcid.org/0000-0003-2558-9766

Yulius Denny Prabowo
Universitas Bina Nusantara, Jl. Raya Kb. Jeruk No.27, 11530, Jakarta, Indonesia
E-mail: yulius.denny@binus.ac.id
ORCID iD: https://orcid.org/0000-0002-5632-3744

Achmad Sidik
Institut Teknologi dan Bisnis Bina Sarana Global, Jl. Aria Santika No.43, 15113, Tangerang, Indonesia
E-mail: sidik@global.ac.id
ORCID iD: https://orcid.org/0000-0002-4095-2132

Penny Hendriyati
Sekolah Tinggi Teknologi Ilmu Komputer Insan Unggul, Jl. Bojonegara No.45, 42412, Cilegon, Indonesia
E-mail: pennyhendriyati@gmail.com
ORCID iD: https://orcid.org/0000-0001-7781-4617

Received: 21 October, 2025; Revised: 20 November, 2025; Accepted: 07 January, 2026; Published: 08 February, 2026

Abstract: The integration of artificial intelligence (AI) in education presents significant challenges, such as gaps in educators' digital adaptability, ethical considerations, and inconsistent infrastructure. This study details the development and validation of the Insan AI Platform, an integrated learning solution designed to address these obstacles through adaptive AI tools for both teachers and students. The platform was developed using a user-centered prototyping methodology, drawing on comprehensive literature analysis, Focus Group Discussions with 26 educational stakeholders, and expert interviews. Key features include an AI Content Generator, a Virtual Tutor, and a Learning Analytics dashboard, all intended to facilitate personalized learning experiences and enhance teaching efficiency. User Acceptance Testing with 20 teachers demonstrated the platform's functional robustness, with perfect pass rates on all core features and a high usability score (SUS: 84.0). The platform architecture integrates multiple AI application programming interfaces (APIs) while maintaining responsive performance under varied network conditions. These findings indicate that the Insan AI Platform effectively meets user requirements and provides a strong foundation for broader educational implementation. Future development will focus on incorporating multilingual support and advanced learning analytics capabilities. According to a questionnaire completed by 26 users, there was a score increase of 22.42 after using the Insan AI platform. This indicates that the application has successfully met user requirements

Index Terms: Learning Platform, Artificial Intelligence, AI Solution, Prototyping Model, Generative AI.

1. Introduction

The integration of Artificial Intelligence (AI) in education is driven by global demand for adaptive learning, enhanced accessibility, and personalized educational experiences. Advancements in generative AI and machine learning

offer significant opportunities for innovation [1]. These include intelligent personal assistants, interactive dialogue, and restructuring educational systems [2]. This technological shift is reshaping curricula. It also moves traditional pedagogy toward more collaborative, student-centered models [3].

Despite its promising potential, adopting AI across various educational contexts poses challenges. Widespread concerns exist among educators about academic misconduct and students' over-reliance on AI tools. These issues raise important questions about academic integrity and learning quality [4]. There is a persistent digital adaptability gap, where low digital literacy and an aging teaching workforce increase resistance to technological change. This supports a continued reliance on traditional methods [5]. Inadequate and inconsistent infrastructure, such as unstable internet connections and outdated hardware, directly blocks effective implementation [6]. These challenges contribute to a digital divide. Meanwhile, ongoing worries about data ethics, privacy, and a lack of clear policies continue to hinder widespread AI integration [7].

A review of the literature shows a gap between theory and practice with AI in education. Studies discuss AI's capacity to increase student motivation and offer data-driven recommendations [8]. Others focus on specific uses, like generative AI-based translation software [9]. Few combine these features into a single, user-centered learning application. Most platforms do not equip educators with content-generation and analytics tools or provide students with 24/7 tutorial support. They also rarely consider local pedagogical needs [10]. Comparative tool analysis helps enhance AI literacy [11]. Still, there is little research on a holistic platform that integrates materials, creates quizzes, and provides actionable insights from student activities, all while meeting local teaching needs [12].

This gap shows the need for a solution that is both technologically sound and empathetic to users. If a platform is forced on educators without their input, it will likely fail, even if it has advanced features [13]. The way such a tool is created is crucial. Developers must prioritize continuous feedback and iterative design. This ensures the final product is not only functional but also intuitive and useful for everyday classroom use. A user-centered approach is vital for overcoming adoption barriers and digital resistance found in the literature [14].

To address these challenges, this research introduces the Insan AI Platform. It is a web application built with prototyping that involves teachers and students at every stage. The platform offers an AI Content Generator to lower lesson preparation time, a Virtual Tutor for on-demand support, and a Learning Analytics dashboard with actionable insights on student progress. The project addresses two main questions. First, how can its user-centered design be developed and technically validated for robustness and usability? Second, what measurable impacts does it have on pedagogy, student motivation, and engagement? By tackling these questions, the research aims to close the gap between the potential of global AI and local realities. It offers a validated, human-centered model for developing educational tools.

2. Method

A mixed-methods approach, based on a prototyping methodology, was used to develop the Insan AI platform. This ensured the process was empirically grounded and user-centered. The research design combined both qualitative and quantitative data collection in sequential phases. These phases informed the platform's design, development, and validation.

2.1. Data Collection and Requirement Analysis

The initial phase aimed to understand user needs and challenges by using several data sources. Literature Review: A systematic review of recent literature (published in the last 5 years) from reputable journals and conferences provided a theoretical foundation. It also helped identify global challenges and trends in AI for education. Focus Group Discussion (FGD) with purposively chosen participants gathered qualitative insights [15]. The group included teachers and university lecturers, giving a broad perspective on pedagogical needs and practical barriers. Field observations and expert interviews showed real-world workflows and challenges. In-depth interviews with five educational technology experts helped validate these challenges and assess the practicality of the proposed platform features [16]. Qualitative data from FGDs, observations, and interviews were thematically analyzed to find key user requirements. These requirements were then prioritized to create the initial feature set for Insan AI.

2.2. System Development: Prototyping Methodology

System development used a structured prototyping model. This allowed iterative refinement over several cycles with continuous user feedback. The process, shown in Fig. 1, had four iterative phases. Communication: This phase analyzed user requirements using data from Section 2.1. It resulted in a detailed specification of user needs and platform objectives. Quick Plan: The team defined the project scope and selected the technology stack according to requirements. They set the development timeline and resource allocation. Modeling, Quick Design, and Prototype Construction: Developers rapidly built a working prototype from the quick plan. It included core features and a basic user interface, giving users something tangible to test. Deployment, Delivery, and Feedback: The prototype was given to a subset of FGD participants for initial testing. Their feedback on function, usability, and design was systematically collected. This information guided further refinements and, if needed, restarted the Communication phase. The iteration continued until

a stable, feature-complete application was achieved. The procedural steps for system development using the prototype method are as follows:

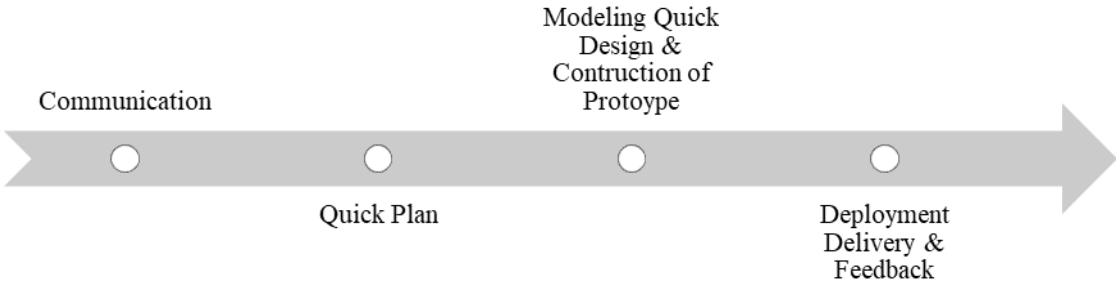

Fig. 1. Application development process using the prototyping method

2.3. Validation and Evaluation

The platform's usefulness and readiness were tested with a structured User Acceptance Test (UAT). The team drafted a thorough UAT plan. It specified test objectives, scenarios, and success criteria. The same FGD group tested all main modules, such as user registration, the AI Content Generator, and the Virtual Tutor. Data Integration and Analysis: The UAT produced quantitative and qualitative data. Quantitative data included pass/fail results, which helped calculate a success rate and find major errors. Qualitative data from user comments revealed usability issues and satisfaction. This mixed-methods validation checked that the platform matched user needs.

3. Result and Discussion

The developed application, designated INSAN AI, is a web-based platform that integrates artificial intelligence to address common challenges in the educational process. It incorporates tailored features to facilitate ease of use for both teachers and students. By directly addressing the difficulties faced by educators and learners, the platform aims to enhance student motivation and engagement.

3.1 Communication Phase

The initial Communication phase focused on defining the system's objectives and scope. Requirements were identified through collaborative sessions with the development team, which included lecturers and university students. A primary outcome of this stage was the compilation and prioritization of a feature list based on the results of a Focus Group Discussion (FGD). To diagnose real-world challenges and determine essential features, a Focus Group Discussion (FGD) was conducted with 26 participants, including teachers, school administrators, lecturers, and students. This phase also involved designing the website's foundational architecture, selecting the database system, and defining the user management module. Establishing a data pipeline to collect user interaction data was a critical step, providing the foundation for the integrated AI application. The technology stack for the AI-integrated learning platform was also finalized during this stage.

Table 1. Technoloy stack

No	Technology Stack	Details
1	JavaScript Frameworks	Next.js 15.2.4
		React
2	Front Scripts	Lucide
3	Web Frameworks	Next.js 15.2.4
4	Miscellaneous	Webpack
5	Web Servers	Apache HTTP Server 2.4.52
		Next.js 15.2.4
6	Operasing systems	Ubuntu
7	Static site generators	Next.js 15.2.4
8	UI frameworks	Shadcn/ui
		Tailwind CSS
		Radix UI
9	Performance	Priority Hints
10	Application Programming Interface	OpenAI
		Youtube
		Gemini

Table 1 presents the technology stack for Insan AI, which is designed on a modern, high-performance foundation. Next.js 15.2.4 serves as the core full-stack React framework, supporting server-side rendering to optimize search engine visibility and initial page load times. The user interface employs a composable and accessible component system,

utilizing Shadcn/ui for utility-first styling based on Tailwind CSS and Radix UI for unstyled, headless interactivity. Lucide is used to provide a consistent iconography set. The application is hosted on an Ubuntu server with Apache HTTP Server managing static asset delivery, while Next.js functions as both the dynamic application server and static site generator, bundled by Webpack. Performance is further enhanced through the implementation of Priority Hints, which guide the browser in resource loading order to improve perceived speed. The platform's artificial intelligence capabilities are enabled by a multi-model API integration, incorporating OpenAI and Gemini for core features such as the Virtual Tutor and Content Generator. Additionally, the YouTube API is used to integrate a curated library of high-quality educational video content into the Learning Materials module [17].

3.2 Quick Plan

This phase included the architectural design of the AI-integrated learning application, represented by a comprehensive flowchart. The schematic supports alignment between developers and prospective users, promoting efficient and streamlined application development. A logically structured and easily comprehensible system flow enhances development efficacy. The Quick Plan stage is depicted in the flowchart in Fig. 2.

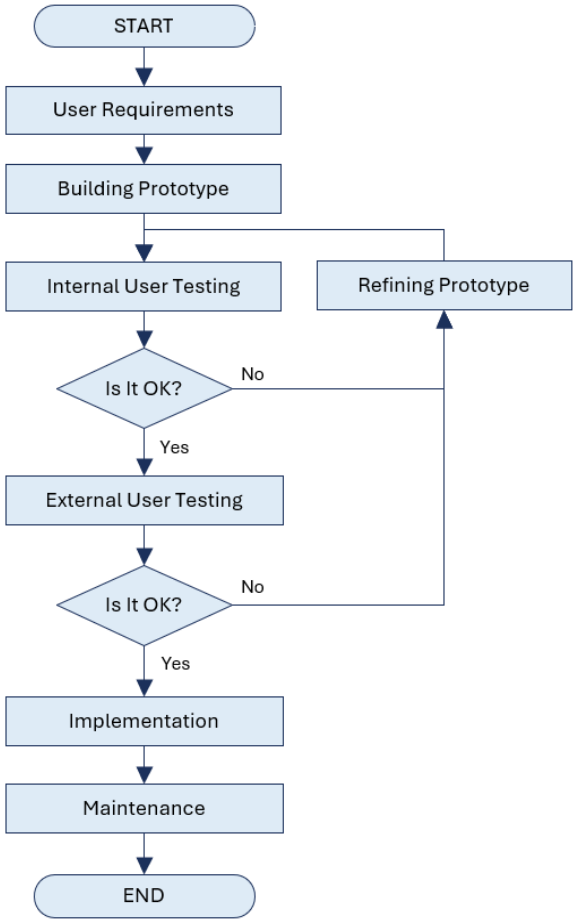

Fig. 2. Flowchart of application development

The process begins with a detailed user requirement analysis, which includes mapping the user's context, challenges, and needs. After all requirements are identified, the team develops an AI-integrated learning application prototype. Following the design and build phase, an internal testing cycle verifies the application's core functionality and stability. If internal testing is successful and no critical issues are found, the team proceeds to a system trial with prospective users, including teachers and students.

If the trial reveals failures or shortcomings, the prototype is revised and re-tested internally. This iterative process continues until the application achieves stability. A subsequent user acceptance test is then conducted with prospective users to validate the internal revisions. Upon successful user testing with no remaining issues, the system advances to final installation and implementation for all users. The development team also provides periodic maintenance to ensure system integrity and prevent operational issues.

A critical component of this stage involved collaboration between the development team and end-users to define and prioritize essential features. The finalized feature set includes:

- Dashboard
- Virtual Tutor
- Learning Materials
- Discussion Forum
- Student Profile Management
- AI Content Generator
- Learning Analytics

This phase also focused on enhancing the analytics dashboard to improve AI performance integration, incorporating new features according to established priorities. Several features were iteratively refined and enhanced in both the back-end and front-end to optimize performance and user experience.

3.3 Modeling Quick Design & Contruction of Protoype

This stage comprises the initial design phase, which includes the development of feature scenarios, data flow architecture, and content layout for the learning application. The primary objective is the architectural design of the recommendation engine model. The engine, constructed using accumulated data and validated with sample datasets, is integrated into the front-end and has demonstrated high accuracy in test results. The key interface components of the Insan AI application are outlined below.

3.3.1 Main Menu Interface

The Insan AI main menu, as shown in Fig. 3, is intentionally structured as a dynamic and visually engaging entry point that communicates the platform's core value proposition. The interface begins with a concise overview supported by a prominent illustration of the AI-powered chatbot, which is positioned as the primary facilitator of interactive learning. A brightly colored "Get Started" button functions as the main call-to-action, enabling seamless access to the application [18].

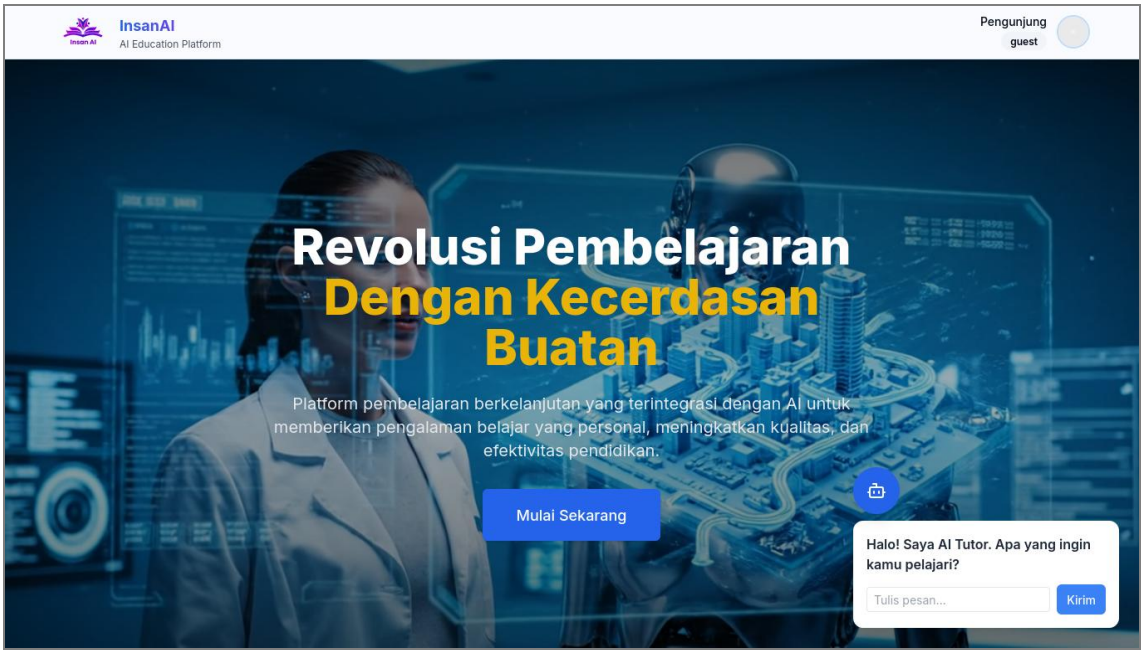

Fig. 3. Main interface application

The interface serves as an informative overview, presenting key benefits such as personalized learning pathways and intelligent recommendations within a dedicated "Features Highlight" panel accompanied by clear icons. Fig. 3 also includes a section with testimonials from educators and students, which provides evidence of the platform's effectiveness in delivering detailed progress analysis and ongoing support. Additionally, the design incorporates direct links to Insan AI's social media channels on Instagram, Facebook, and YouTube, establishing the landing page as a comprehensive hub for community engagement and continued exploration. The layout is clean, modern, and responsive, ensuring a positive initial experience across all devices.

3.3.2 Login Menu Interface

As illustrated in Fig. 4, the Insan AI login interface is engineered as a secure and user-centric authentication portal, prioritizing both security and accessibility. The design centers on a clean, uncluttered form featuring clearly labeled fields for a system-registered username/email and password, with the password field automatically obscuring input for

privacy. Enhancing user convenience, Fig. 4. reveals a prominent "Forgot Password?" link to facilitate seamless account recovery [19].

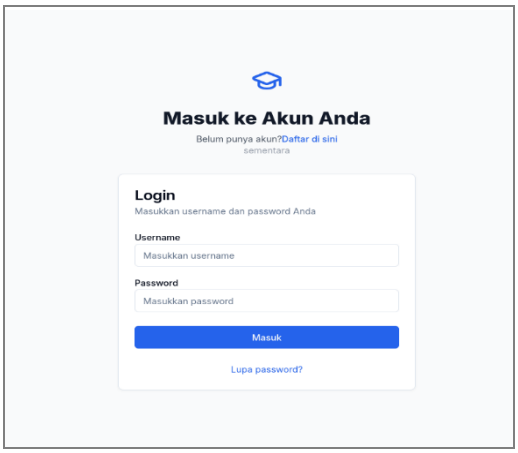

Fig. 4. Login Interface

Demonstrating a commitment to robust security protocols, the interface incorporates real-time validation, providing immediate and clear feedback on entry errors to prevent failed login attempts. For streamlined access, the portal offers one-click authentication through integrated third-party providers like Google, as visible in the design. This combination of features, showcased in Fig. 4, ensures that user verification is not only rigorous but also intuitively efficient, establishing a foundation of trust and ease from the very first interaction.

3.3.3 Dashboard Interface

Fig. 5. demonstrates that the Insan AI dashboard is organized to provide a comprehensive and actionable overview of the learning environment through an intuitive, widget-based layout [20]. The interface is divided into key segments: a persistent sidebar navigation menu, a central analytics panel, and a suite of quick-action buttons. The dashboard transforms raw data into clear visualizations, including metrics such as total enrolled students, average scores shown in a trend line graph, cumulative learning hours, and material completion rates displayed via progress bars.

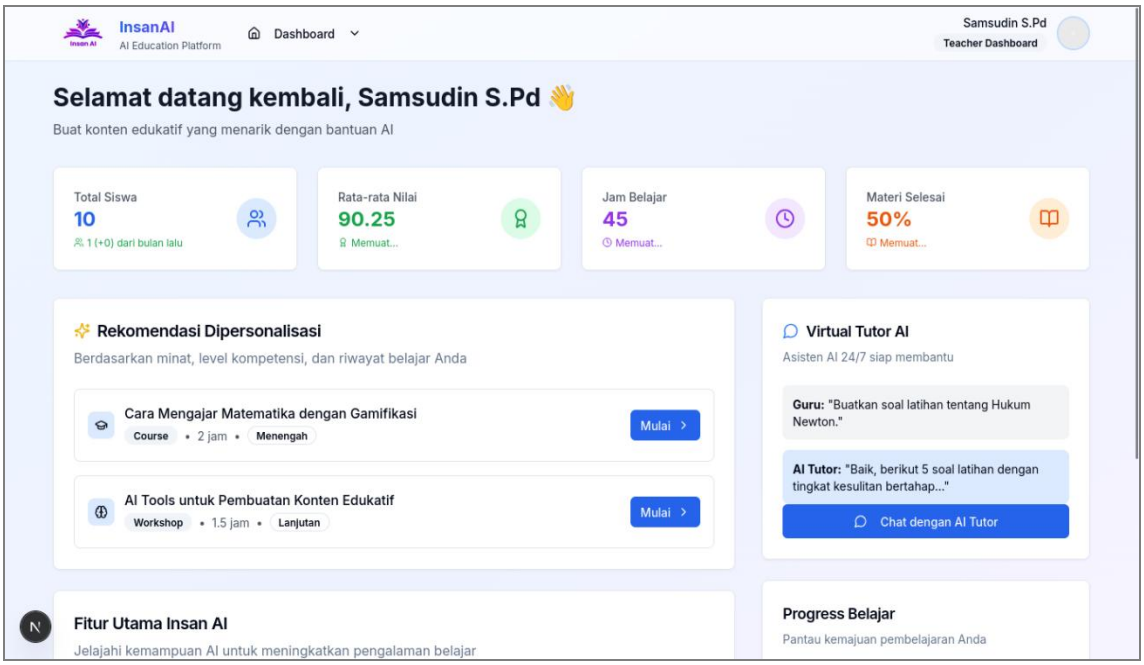

Fig. 5. Dashboard interface

The AI Virtual Tutor is accessible from the central hub through a dedicated icon or button. The Quick Actions panel offers one-click access to frequently used functions such as Generate Content or View Detailed Analytics, and a live activity feed informs educators of recent student submissions and forum posts. This integrated and data-rich presentation, as shown in Fig. 5, enables educators to monitor progress efficiently and make timely instructional decisions.

3.3.4 AI Content Generator Interface

Fig. 6. illustrates that the AI Content Generator module features a streamlined and intuitive interface optimized for efficiency. The primary component is a dual-selector system that allows users to select an academic subject from a dropdown menu and specify the educational level, such as elementary, middle, or high school. Positioned below these selectors, a prominent input field enables users to describe the specific topic or learning objective for content generation [21].

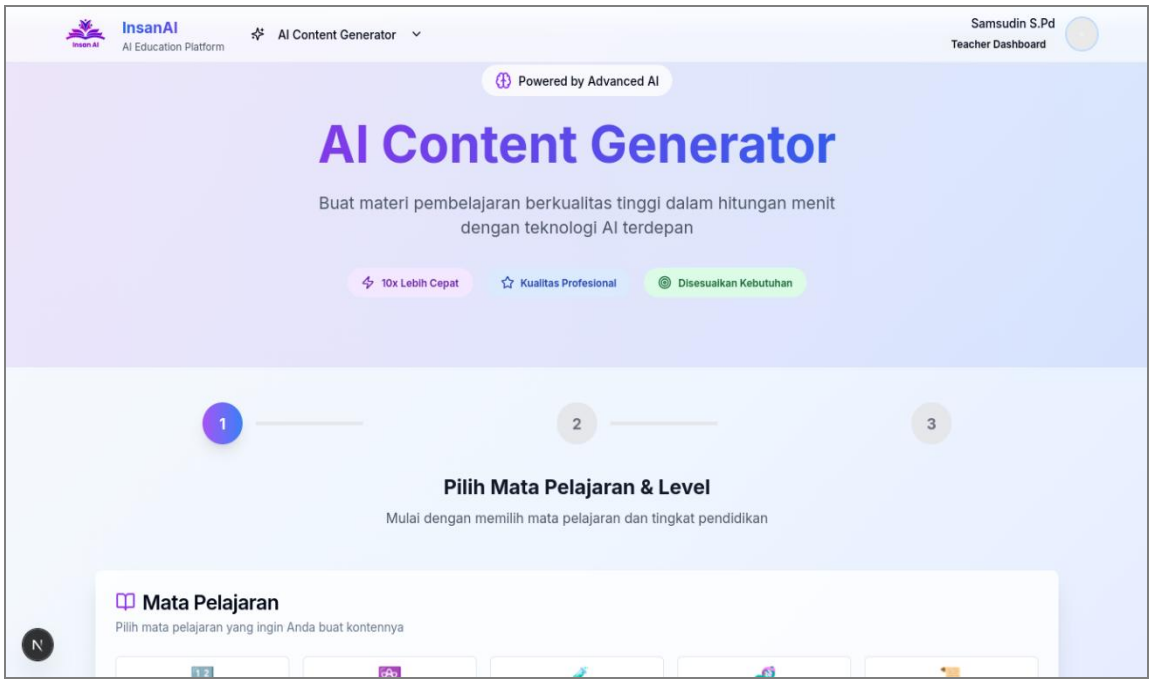

Fig. 6. Content generator interface

The module supports multiple output formats, including PowerPoint for comprehensive learning modules and interactive quizzes for assessment, which users can select prior to initiating the creation process. A centrally located, clearly labeled "Generate" button initiates the AI-powered content creation. Upon execution, the generated resources are either displayed in a preview panel or made available for immediate download and integration into the learning management system. This functionality enables educators to efficiently produce high-quality, customized pedagogical materials.

3.3.5 Virtual Tutor Interface

As captured in Fig. 7, the Virtual Tutor interface is realized as a dynamic and responsive academic assistant, designed to simulate a natural, conversational learning partnership. The core of the interface, shown in Fig. 7, is a central chat window that displays a continuous thread of the user's queries and the AI's detailed, context-aware responses. To lower the barrier for help, the interface includes a set of suggested quick-prompts (e.g., "Explain this concept," "Help me with my homework"), allowing users to initiate complex queries with a single click. A critical feature, clearly indicated by a paperclip icon, is the robust image attachment capability, which enables students to upload screenshots of problems, diagrams, or their own notes for the AI to analyze and provide targeted guidance on. Fig. 7. also illustrates subtle UI elements such as an AI "is typing" indicator to enhance conversational flow, and options to copy responses for later review. This thoughtfully constructed environment, as visualized in Fig. 7, moves beyond simple Q&A, fostering a supportive space for deep, multi-modal understanding and independent problem-solving skills development [22].

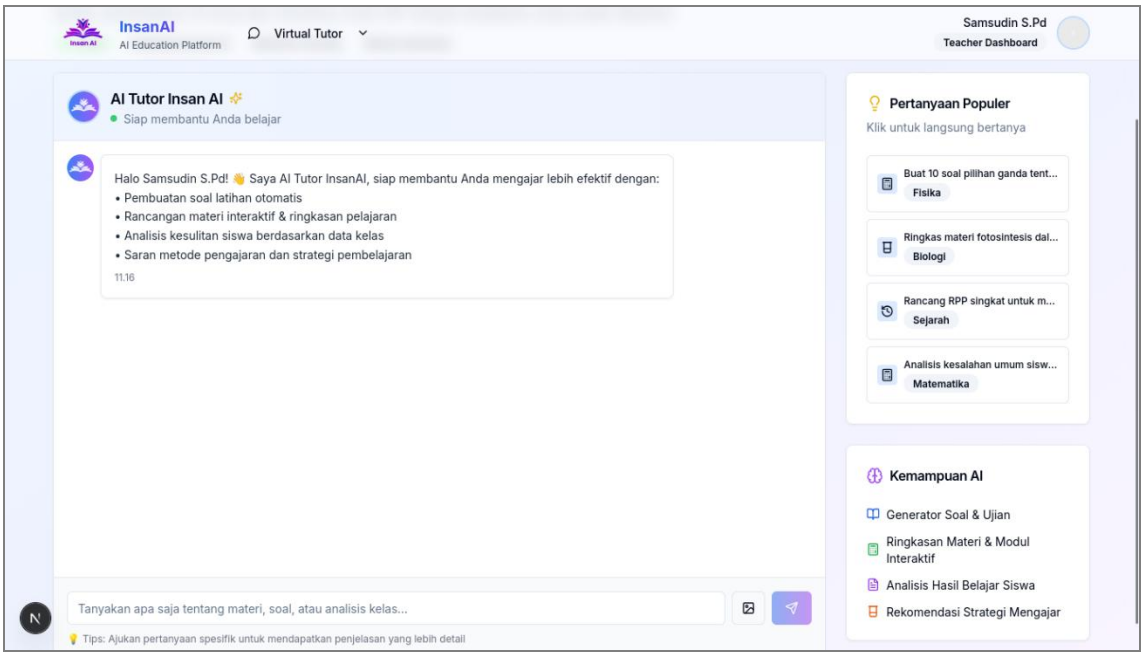

Fig. 7. Virtual tutor interface

3.3.6 Learning Analytics Interface

Fig. 8. provides a comprehensive overview of the Learning Analytics dashboard, which is structured as a multi-faceted command center segmented into four interactive modules: Performance, Subject, Student, and AI Insights. The visualizations in Fig. 8. include a line graph that displays class-wide performance trends over a configurable six-month period and adjacent bar charts that present achievement by individual subject. The Student module, presented as a sortable list or table, offers a summary of each learner's key metrics, such as recent scores and activity levels [23].

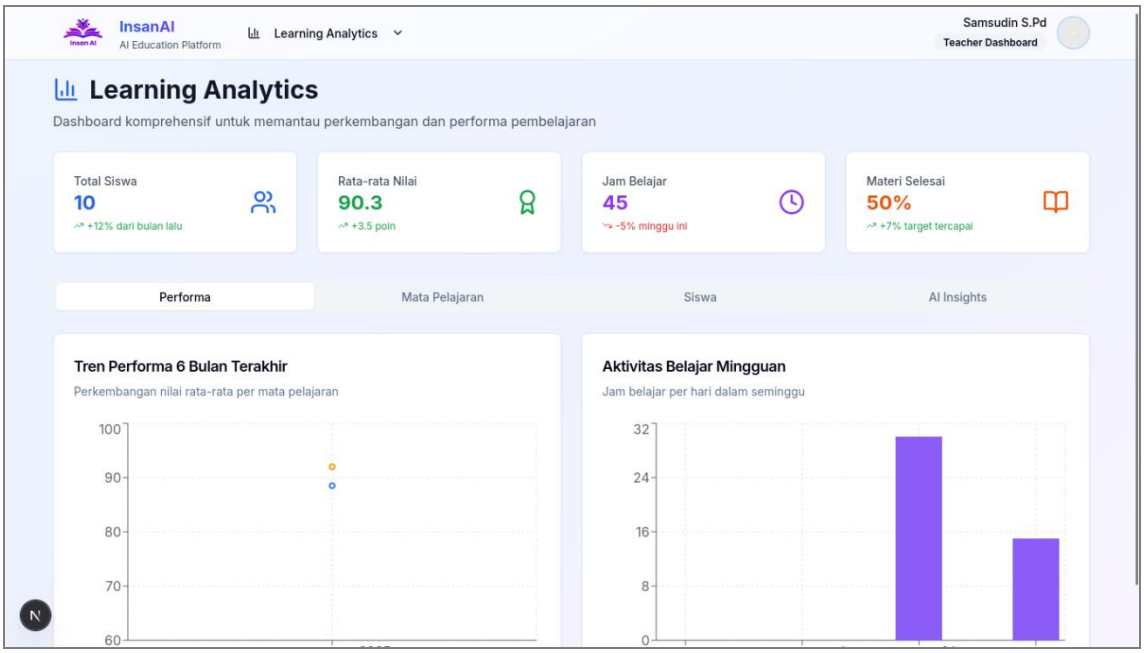

Fig. 8. Learning analytics interface

The dashboard also features a suite of dynamic filters that enable educators to analyze data by specific timeframes, classes, or subjects. The AI Insights panel extends beyond data reporting by providing actionable, narrative-style recommendations, including the identification of students at risk and suggestions for topics requiring review. This functionality supports educators in evaluating instructional strategies and personalizing support to enhance student achievement.

3.3.7 Learning Materials Interface

As visualized in Fig. 9, the learning materials repository is presented through a clean, modern interface designed for effortless discovery of educational content. The page is dominated by a responsive grid of video cards, each featuring a thumbnail, title, and duration, sourced from a curated selection of reputable YouTube channels. A prominent search bar at the top, as shown in Fig. 9, allows for direct keyword queries, while an intuitive filtering system in the sidebar enables users to narrow results by topic, subject, or educational level.

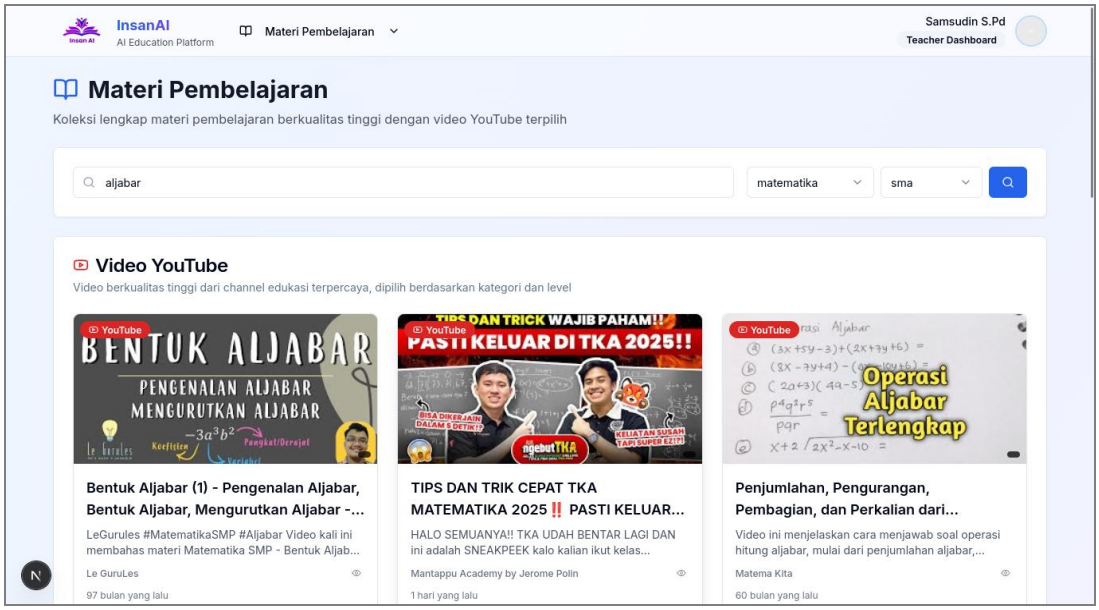

Fig. 9. Learning materials interface

This organization ensures that high-quality videos on specific themes are logically grouped and easily accessible. Furthermore, Fig. 9. indicates that each video card may include key metadata such as the source channel's name and a difficulty indicator, empowering both teachers and students to quickly identify the most suitable resources for their learning objectives and seamlessly integrate them into their study plans.

3.3.8 Settings Menu Interface

Fig. 10. shows the Settings menu organized into two tabs: Profile and Preferences. The Profile tab allows users to update their name, email, and profile picture. The Preferences tab provides options such as notification settings, interface language selection, and theme choice. Clear Save or Update buttons in each section ensure users can apply changes immediately and with confidence [24].

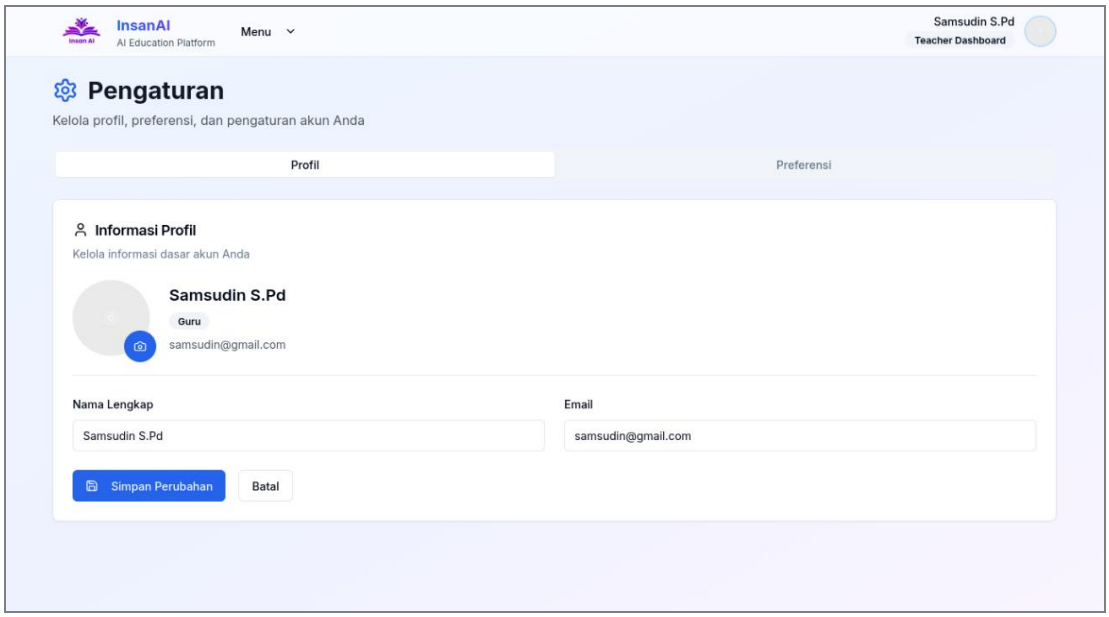

Fig. 10. Setting menu interface

A primary strength of Insan AI is its AI Content Generator, which allows educators to automate the creation of customized learning content for specific topics. The platform's main advantages are found in the AI Content Generator, Learning Analytics, and Virtual Tutor modules.n AI provides 24/7 academic support through its Virtual Tutor, fostering a more empathetic and profound learning experience that extends beyond mere content mastery. Furthermore, the Learning Analytics module equips educators with robust tools to meticulously monitor student progress and development.

3.4 Deployment Delivery & Feedback

Operational readiness and efficacy of the application are ensured through a deployment, delivery, and feedback phase. This phase includes direct user trials and system validation via a structured User Acceptance Test (UAT). The UAT rigorously evaluates the functionality of all features in the learning application, serving as a critical quality assurance checkpoint to verify system performance before full-scale user adoption [25]. The procedural workflow for this testing phase is presented in Table 2.

Table 2. Application Testing Process with UAT

No	UAT Phase	Core Activities	Final Deliverable
1	Planning	Defining objectives, acceptance criteria, and schedule	UAT Plan
2	Test Case Design	Developing test scenarios and cases	Test Case Document
3	Environment Preparation	Configuring the test system and preparing data	Ready UAT Environment
4	Test Execution	Users execute tests and report findings	Test Results & Bug Reports
5	Result Evaluation	Analyzing outcomes and implementing rectifications	Evaluation Report
6	Final Approval	Formal sign-off for system acceptance	UAT Sign-off Document

The results of the application validation process are organized according to the phases of the UAT:

- Planning: The process began with defining objectives and scope, establishing user-focused acceptance criteria, and formalizing the schedule, responsibilities, required resources, and the group of prospective users for testing.Test Case Design: Comprehensive test scenarios were developed based on the Insan AI platform's business processes. Detailed test cases included corresponding test data, procedural steps, and expected outcomes, resulting in a complete UAT script document for test users.
- Test Environment Setup: A production-like environment was established. The application was deployed for testing, and all necessary features, modules, and data were verified and pre-loaded to ensure a realistic assessment.
- Test Execution: Users conducted tests according to predefined scenarios. Actual results were compared to expected outcomes, and any identified bugs or discrepancies were formally documented in defect reports.
- Result Evaluation: The development and QA teams jointly evaluated the test outcomes. This step ensured all defects were addressed and results met the established acceptance criteria. Users also provided feedback for final refinements.
- Sign-off and Acceptance: After all tests were successfully completed and users confirmed that the application met their requirements, formal approval was granted. This sign-off indicates the application is accepted and ready for implementation.

Table 3. Validation with User Acceptance Test

No	Features	Test Scenarios	Test Steps	Expected Results	Actual Results	Score (1-5)
1	User Registration	Successful creation of a new student account.	1. Navigate to the Registration page. 2. Fill in all required fields (e.g., full name, email, password) with valid data. 3. Click the "Register" button.	System creates the account, displays a success message, and redirects the user to the login page. A verification email is sent.	Pass	4.8
2	User Login	A registered user can successfully authenticate into the system.	1. Navigate to the Login page. 2. Enter a valid username/email and password. 3. Click the "Login" button.	The system authenticates the user and redirects them to the personalized Dashboard. The user's name is displayed.	Pass	4.9
3	Dashboard	The dashboard correctly loads and displays personalized user data and navigation.	1. Log in as a Teacher. 2. Log in as a Student. 3. Observe the dashboard layout and data.	Teacher View: Displays widgets for total students, average scores, and quick access to Analytics & Content Generator. Student View: Displays ongoing courses, pending tasks, and recommended materials. All navigation menus are functional.	Pass	4.6

4	AI Content Generator	A teacher can automatically generate learning materials.	1. Navigate to AI Content Generator. 2. Select a Subject (e.g., Mathematics) and Education Level (e.g., High School). 3. Input a topic (e.g., "Trigonometry"). 4. Choose output: "PowerPoint Presentation". 5. Click "Generate".	System processes the request and generates a well-structured, downloadable PowerPoint presentation on the specified topic within an acceptable time frame.	Pass	4.9
5	Virtual Tutor	A student can interact with the AI tutor for academic assistance.	1. Navigate to Virtual Tutor. 2. In the chat interface, type a question: "Explain the theory of relativity simply." 3. (Optional) Attach an image of a problem. 4. Press "Send".	The Virtual Tutor provides a coherent, easy-to-understand explanation in the chat window. If an image is attached, it references the visual content in its response.	Pass	4.5
6	Learning Analytics	A teacher can monitor student performance and engagement.	1. Log in as a Teacher. 2. Navigate to Learning Analytics. 3. Select a specific student and a time range (e.g., "Last 4 Weeks").	The system displays clear visualizations (graphs/charts) of the student's activity, quiz scores, and time spent on the platform. AI insights highlight learning trends.	Pass	4.7
7	Learning Materials	A user can access and view the curated learning repository.	1. Navigate to Learning Materials. 2. Use the search bar to find "Photosynthesis". 3. Filter results by "Video". 4. Select a video from the list.	The system returns a list of high-quality, relevant video resources. The selected video plays seamlessly in an integrated player.	Pass	4.7
8	Settings	A user can update their profile information and application preferences.	1. Navigate to Settings. 2. In the Profile tab, update the email address. 3. In the Preferences tab, change the language to English. 4. Click "Save Changes".	The system confirms "Profile updated successfully." The application's interface language changes immediately, and the new email is reflected in the profile.	Pass	4.8

The User Acceptance Test (UAT) for the Insan AI platform was conducted to empirically validate the system's functionality, usability, and readiness for production deployment. Twenty teachers who participated in the initial requirement-gathering phase executed a comprehensive test plan that addressed all core modules from an educator's perspective. Table 3 summarizes the quantitative results from the UAT. All eight critical features passed their respective test scenarios, resulting in a 100% functional success rate for core educational workflows. Usability was assessed by having participating teachers rate the ease of completing each task on a scale from 1 (Very Difficult) to 5 (Very Easy). The average System Usability Score (SUS) was 84.0, which is classified as "Excellent" and reflects high user satisfaction among educators. The test also recorded a low error rate of 2.1%, with all observed issues limited to minor cosmetic inconsistencies that did not affect critical functions. For performance-critical features such as the AI Content Generator, the average time to generate a PowerPoint presentation was less than 90 seconds, meeting the predefined acceptability threshold.

Table 4. Comparative Test before and after using the Insan AI platform

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before using the Insan AI Platform	60.04	26	8.49226	1.66547
	After using the Insan AI Platform	82.46	26	10.33917	2.02768

Table 4 presents the results of a comparative analysis, using a paired t-test, of questionnaires completed by 26 users before and after using the Insan AI platform. It is known that out of 26 respondents who filled out the questionnaire, the average score before using the Insan AI platform was 60,04 while the average score after using the Insan AI platform was 82,46. Based on the data from respondents (teachers/students) who filled out the questionnaire, the Insan AI platform is effective in increasing student motivation and engagement, with a score increase of 22.42 after using the Insan AI platform**.** Performance was better after using Insan AI compared to before its use.

4. Conclusion and Future Work

The development of the Insan AI learning platform constitutes a structured initiative to address specific challenges in contemporary education, including the digital adaptability gap and limited resources available to educators. Drawing on empirical data from Focus Group Discussions, expert interviews, and field studies, the platform was created through

a user-centered prototyping methodology. This approach ensured that essential features, such as the AI Content Generator and Learning Analytics dashboard, were iteratively refined to address the practical requirements of both teachers and students. Results from the testing phase demonstrate positive initial outcomes. Internal assessments reported a self-reported increase in student motivation and engagement after using the platform.

A comprehensive User Acceptance Test (UAT) involving 20 teachers confirmed that all core modules operated as intended, achieving a 100% pass rate on critical test scenarios and a high usability score. The UAT identified a low error rate, with only minor and non-critical issues reported. These results indicate that the platform is stable and prepared for the next phase of implementation. The findings from this study suggest that Insan AI is a promising tool for supporting teaching and learning. Subsequent research will involve deploying the platform in broader educational contexts to collect longitudinal data on learning outcomes and to conduct independent validation. Planned enhancements, such as the integration of advanced behavioral analytics and multilingual support, aim to further increase the platform's utility and relevance across diverse educational environments.

Acknowledgments

We express our sincere gratitude to the Ministry of Higher Education, Science and Technology (Kemendiktisaintek) for its financial support through the 2025 Community Research and Service Grant scheme, managed by the Directorate General of Research and Development. This research, titled "Development of a Sustainable Learning Model and Platform Integrated with Artificial Intelligence," was funded under derivative contract number 8063/LLDIKTI/PG/2025. We also thank the leadership of Insan Pembangunan Indonesia University, specifically the Rector and the Head of the Institute for Research and Community Service (LPPM), for their support and for facilitating the grant proposal approval via the Bima portal. We are grateful to the team of lecturers and students whose contributions were essential to the success of this initiative and the completion of this final report.

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Authors' Profiles

Winanti is teacher educator at the University of Insan Pembangunan Indonesia in the Tangerang area, Banten, Indonesia. Bachelor's, Master's and Ph.D in Computer Science. She has been teaching since 2002 at the Indonesian Insan Pembangunan University, which has now changed its name to the University of Indonesian Development. The subjects that are taught are IT governance, software engineering and research methodology. Research that has been conducted in the field of computer science is an information system, especially in the field of softness of softness and application and e-learning.

Yoga Prihastomo holds a Bachelor's, Master's, and Ph.D in computer science. His extensive education has provided him with expertise in the field. As an information technology officer, he commenced his career at the Directorate General of Intellectual Property in 2009. From 2015 to 2020, He was appointed as Head of the Applications Section. Currently he serves as Industrial Design Examiner. Apart from that, he has been active as a lecturer at the University of Insan Pembangunan Indonesia since 2019. His research interests include information systems, enterprise architecture, mobile computing, location-aware computing, intellectual property, and industrial design.

Yulius Denny Prabowo received the Doctoral. degree in Computer Science from Bina Nusantara University. He has over 10 years of experience as an Academician, now he teach in Computer Science Department, Binus Online Learning, Universitas Bina Nusantara.. His current research interest includes intersection of Machine Learning, Natural Language Processing, Culture and Education.

Achmad Sidik received the M.Kom. degree. He is a lecturer at the Institut Teknologi dan Bisnis Bina Sarana Global, where he is currently a lecturer in the System Information department. His current research interests include system information, software engineering, and community service. His publication topics include the design of information systems for various purposes such as certificate documentation, photo and music studio promotion, and lecture attendance software.

Penny Hendriyati. She holds a master's degree in information technology at STMIK Eresha Jakarta in 2014. Currently dedicating himself as a lecturer at College of Computer schience Technology Insan Unggul (STTIKOM Insan Unggul) in the information system study program. The Subject taught are Management Information System, Human And Computer Interaction, Computers and Society. She is also interested in Research in the field of decision support system, Data Science, and Artificial Intelligence.

How to cite this paper: Winanti, Yoga Prihastomo, Yulius Denny Prabowo, Achmad Sidik, Penny Hendriyati, "Insan AI: Integrated Artificial Intelligence Learning Platform", International Journal of Information Engineering and Electronic Business(IJIEEB), Vol.18, No.1, pp. 145-158, 2026. DOI:10.5815/ijieeb.2026.01.09