JURNAL HASIL PENGABDIAN MASYARAKAT (JURIBMAS)
https://ejurnal.lkpkaryaprima.id/index.php/juribmas
e-ISSN: 2961-7286 | p-ISSN: 2962-3677
Volume 5 No 1 Juli 2026 | Page: 246-258
DOI: https://doi.org/10.62712/juribmas.v5i1.1038

# Improving Students' Artificial Intelligence Literacy through Hybrid Training in Supporting the Competency of the Society 5.0 Era

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**Abstract**

This community service program aimed to improve university students' Artificial Intelligence (AI) literacy through hybrid training that supports the competencies required in the Society 5.0 era. The rapid advancement of digital technology has increased the need for students to understand, utilize, and critically evaluate AI technologies in academic and professional contexts. The program was implemented using a hybrid learning approach that combined face-to-face and online learning activities through educational counseling, workshops, interactive discussions, and practical simulations of AI applications. The participants were university students who received training in basic AI concepts, ethical use of AI, digital literacy, and the implementation of AI technologies to support academic activities and twenty-first-century competencies. The instruments used in this activity included training modules, digital presentation media, observation sheets, and pre-test and post-test evaluations to assess participants' understanding before and after the training sessions. The findings indicated that the hybrid training successfully improved students' understanding of Artificial Intelligence, enhanced their ability to use AI technologies in academic activities, and increased their awareness of ethical and responsible AI use. Furthermore, the hybrid learning model provided flexible, interactive learning experiences that promoted active participation and strengthened students' adaptability to the digital transformation in the Society 5.0 era. The program also demonstrated that AI literacy plays a significant role in supporting students' readiness for technology-driven educational and professional environments. Therefore, hybrid AI literacy training can serve as an effective and relevant model for developing digital competencies in higher education and supporting the transformation of education in the Society 5.0 era.

**Keywords:** Artificial Intelligence, AI literacy, hybrid training, university students, Society 5.0.

## 1. INTRODUCTION

The rapid advancement of digital technology in the Society 5.0 era has significantly transformed higher education systems, particularly in the need to develop Artificial Intelligence (AI) literacy among university students. This transformation requires students not only to possess digital technological skills but also to understand, evaluate, and utilize AI technologies ethically and responsibly in academic and professional contexts. AI literacy has increasingly been recognized as a multidimensional competency encompassing knowledge, practical skills, critical thinking, ethical awareness, and problem-solving abilities related to the use of AI technologies in educational environments (Chee et al., 2025; Domínguez Figaredo & Stoyanovich, 2023; Farrelly & Baker, 2023; Salhab, 2024; Xiao et al., 2024). In higher education, AI literacy is becoming an essential competency, as students are expected to enter workplaces characterized by automation, data-driven systems, and intelligent technologies. Consequently, universities are required to develop innovative learning strategies that prepare students for technological transformation and the demands of Society 5.0. One relevant approach is the implementation of hybrid training models that combine face-to-face learning with online instruction to create flexible, collaborative, and technology-integrated learning experiences. Therefore, community service activities focused on improving students' AI literacy through hybrid training are highly

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relevant for addressing the growing demand for adaptive digital competencies among university students. Furthermore, such initiatives represent higher education institutions' contributions to the preparation of innovative, technologically competent, and future-ready human resources.

AI literacy in higher education is not merely about the technical ability to operate AI applications but also about the capacity to understand AI concepts, critically assess AI-generated outputs, solve problems with AI technologies, and consider the ethical implications of AI use. Previous studies have identified several dimensions of AI literacy, including data literacy, algorithmic understanding, ethical awareness, AI-assisted problem solving, and the ability to verify AI-generated information (Chee et al., 2025; Salhab, 2024; Xiao et al., 2024). These findings indicate that university students require systematic educational interventions to ensure that AI technologies are used not only as automation tools but also as instruments for creativity, innovation, and critical inquiry. On the other hand, the increasing use of generative AI in academic environments has also raised concerns related to academic integrity, information validity, overreliance on AI systems, and ethical issues in educational practices (Farrelly & Baker, 2023). Therefore, strengthening AI literacy through structured training programs is essential to fostering responsible, critical AI use among students. In this context, the hybrid training implemented in this community service program was designed to provide both conceptual understanding and practical experience in the use of AI technologies to support academic activities, digital competence development, and workforce readiness in the Society 5.0 era. The hybrid learning approach was selected because it integrates the advantages of face-to-face interaction and online learning, thereby promoting flexibility, interactivity, and accessibility in technology-based education.

The urgency of implementing this community service program is closely aligned with the fundamental concept of Society 5.0, which positions humans at the center of technological innovation and emphasizes integrating digital technologies such as Artificial Intelligence, big data, and the Internet of Things across various aspects of life. In the educational sector, Society 5.0 requires students to possess advanced digital competencies that enable them to adapt to rapidly evolving technological environments. Several studies have highlighted the transformative role of AI in education through adaptive learning systems, intelligent tutoring, automated academic administration, personalized learning experiences, and data-driven educational practices (Ally & Perris, 2022; Mohammed AL WORAFI et al., 2024; Mykhaylenko et al., 2024). However, the successful implementation of AI in education largely depends on the readiness of human resources, especially students and educators, to understand and utilize these technologies effectively and ethically. Insufficient AI literacy may hinder students' ability to maximize technological opportunities in academic and professional settings. Therefore, hybrid AI literacy training becomes a strategic initiative to equip students with the competencies required to navigate educational and workforce transformations in the Society 5.0 era. Moreover, this community service activity reflects the implementation of the higher education tri dharma mission by empowering the community through relevant, future-oriented technological education programs.

The implementation of hybrid training in this program is supported by various studies demonstrating the effectiveness of blended learning models in improving students' digital competencies and technological understanding. Hybrid learning refers to an instructional model that combines synchronous and asynchronous learning through the integration of offline and online educational activities (Lymperis, 2021). This model enables students to engage in flexible, collaborative, and student-centered learning experiences. Previous studies have shown that hybrid learning can improve digital literacy, ICT skills, learner motivation, and problem-solving abilities when designed using appropriate pedagogical frameworks (D. Ainin, MAED & M. Bauyot, PhD, 2024; Menggo & Darong, 2022). Furthermore, hybrid learning environments support independent learning, increase student participation, and expand access to technology-based educational resources. In the context of this community service activity, the hybrid approach was particularly relevant because it not only facilitated the delivery of AI-related content but also allowed students to directly experience digital learning ecosystems that reflect contemporary educational trends. The training program emphasized not only theoretical knowledge transfer but also practical engagement with AI platforms to support academic tasks, information management, and the development of digital creativity. Consequently, the

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implementation of hybrid AI literacy training is expected to produce sustainable positive impacts on students' digital competencies and technological adaptability.

This community service program aims to improve university students' Artificial Intelligence literacy through hybrid training to support competencies required in the Society 5.0 era. Specifically, the program seeks to enhance students' conceptual understanding of AI technologies, improve their practical skills in utilizing AI applications productively and ethically, and strengthen their readiness to face digital transformation in education and future workplaces. Additionally, the training program aims to increase students' ability to utilize AI technologies for academic activities, information retrieval, task completion, and innovation development. The program also emphasizes ethical awareness in the use of AI to ensure that students can critically evaluate AI-generated outputs rather than relying solely on automated systems. These objectives are aligned with the broader educational goals of developing twenty-first-century competencies, including critical thinking, creativity, collaboration, communication, and digital literacy. Through this hybrid training initiative, students are expected to become more adaptive, innovative, and responsible users of AI technologies within academic and professional environments.

Based on the background described above, the problem formulation of this community service activity focuses on how hybrid training can improve university students' Artificial Intelligence literacy to support the competencies required in the Society 5.0 era and on how such training contributes to students' understanding, technological skills, and readiness to utilize AI effectively and responsibly. This problem formulation serves as the foundation for implementing and evaluating the program's effectiveness. Conceptually, this activity is supported by previous literature emphasizing the importance of AI literacy development as a fundamental competency in modern higher education and the effectiveness of hybrid learning approaches in enhancing digital skills and technology-based learning experiences (Chee et al., 2025; Farrelly & Baker, 2023; Lymperis, 2021; Menggo & Darong, 2022). Therefore, this community service program not only addresses practical educational needs but also contributes academically to the development of AI-based educational practices and digital transformation initiatives in the Society 5.0 era.

## 2. RESEARCH METHODOLOGY

The community service program, "Improving Students' Artificial Intelligence Literacy through Hybrid Training in Supporting Society 5.0 Competencies," was implemented using a hybrid learning approach that integrated face-to-face and online learning activities. The program design combined educational counseling, workshops, interactive discussions, and practical simulations of Artificial Intelligence applications to enhance students' understanding and technological competencies. The hybrid model was selected because it provides flexibility, accessibility, and interactive learning experiences that align with the characteristics of digital learning environments in the Society 5.0 era. The participants in this program were university students involved in various training activities focused on the conceptual understanding of AI, its ethical use, and the practical implementation of AI technologies in academic contexts. The training activities were conducted synchronously through direct classroom interaction and online sessions, while asynchronous learning activities allowed participants to explore AI platforms and digital learning materials independently. The instruments used during the implementation included AI literacy training modules, digital presentation media, observation sheets, documentation records, and pre-test and post-test evaluation instruments designed to measure participants' understanding before and after the training sessions. The implementation stages began with identifying students' needs in Artificial Intelligence literacy, followed by preparing training materials based on Society 5.0 competencies and current AI developments. Subsequently, the program continued with the delivery of conceptual materials, practical workshops on AI utilization, guided discussions, and direct assistance in operating AI-based platforms for academic purposes.

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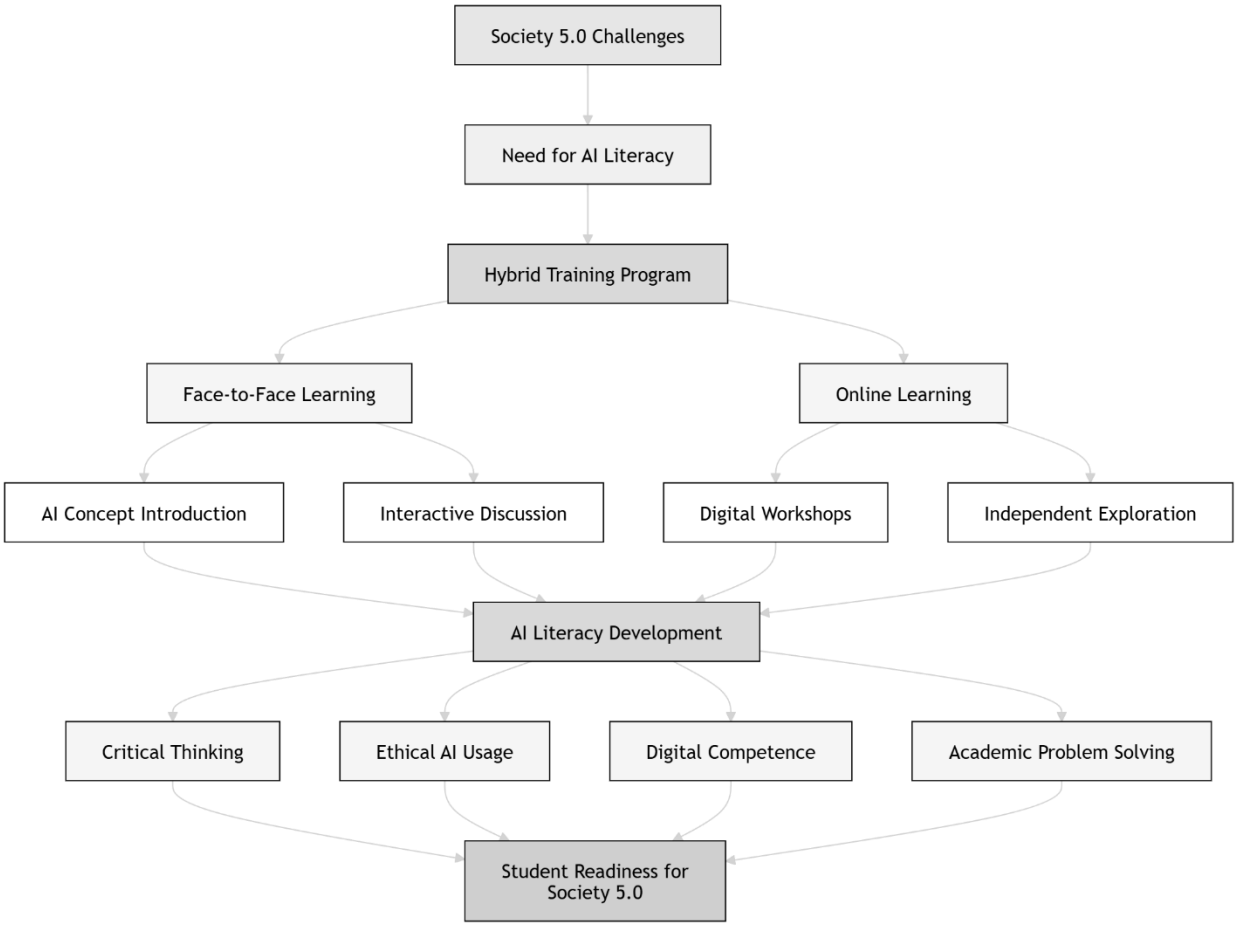


**Figure 1.** Hybrid Artificial Intelligence Literacy Training Framework for University Students in the Society 5.0 Era

Data collection techniques included administering pre- and post-test assessments, observing participant engagement during training activities, documenting the implementation process, and gathering participant feedback on the effectiveness of the hybrid training model. Furthermore, the evaluation analysis technique was conducted descriptively by comparing participants' understanding before and after the training, analyzing student participation during hybrid learning activities, and identifying changes in students' awareness and competencies related to ethical and productive AI utilization. The implementation method was designed based on previous studies emphasizing that AI literacy development should integrate conceptual knowledge, technological skills, ethical reasoning, and critical evaluation abilities in educational settings (Chee et al., 2025; Domínguez Figaredo & Stoyanovich, 2023; Farrelly & Baker, 2023; Salhab, 2024; Xiao et al., 2024). Additionally, the use of hybrid learning in this program was supported by studies demonstrating that blended learning approaches can effectively improve digital competencies, ICT literacy, learner engagement, and technology-based learning outcomes when appropriately designed and implemented (D. Ainin, MAED & M. Bauyot, PhD, 2024; De Los Reyes et al., 2024; Lymperis, 2021; Menggo & Darong, 2022; S & G, 2024).

## 3. RESULTS AND DISCUSSION

The implementation of a community service program through hybrid Artificial Intelligence literacy training for university students demonstrates that strengthening digital technology competencies is highly relevant in the Society 5.0 era. Based on the overall implementation process, the program functioned not only as a medium for transferring

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knowledge about Artificial Intelligence but also as a platform for developing students' critical thinking, evaluative skills, and ethical awareness regarding the utilization of AI in academic and professional contexts. The findings indicate that AI literacy plays a strategic role in preparing students to face transformations in educational systems, learning environments, and future workplaces increasingly influenced by digital technologies. These findings are consistent with the perspectives of Chee et al. (2024), Farrelly and Baker (2023), and Salhab (2024), who argue that AI literacy is a multidimensional competency involving conceptual understanding, practical application, ethical reasoning, critical evaluation, and responsible use of AI technologies. In this community service activity, students were not only introduced to technical AI applications but also encouraged to understand the broader implications of AI use for academic integrity, learning effectiveness, and professional competency development. The hybrid training model provided students with opportunities to experience technology-based learning through the integration of face-to-face interaction and digital learning platforms. Consequently, the findings suggest that AI literacy development cannot be separated from the establishment of adaptive, flexible, and context-oriented digital learning ecosystems that support students' readiness to engage with technological transformation in Society 5.0.

The activity findings also indicate that hybrid AI literacy training significantly improved students' understanding of the utilization of Artificial Intelligence in academic activities. Throughout the implementation process, students gained opportunities to learn basic AI concepts, explore various AI platforms, and practice using AI technologies to support academic tasks and learning activities. These findings support the study by Jingyu et al. (2024), which emphasizes the positive relationships among AI literacy, educational attainment, and students' academic well-being in digital learning environments. The utilization of AI technologies in learning processes enables students to access information more efficiently, explore creative ideas, and develop problem-solving skills through digital tools. In this activity, students were encouraged to critically evaluate AI-generated outputs rather than relying entirely on automated systems. This aspect became particularly important because the rapid development of generative AI technologies has raised concerns regarding academic integrity, misinformation, and overdependence on AI-generated content, as highlighted by Farrelly and Baker (2023). Therefore, the training emphasized not only technical proficiency but also students' ability to verify information, understand the limitations of AI systems, and recognize ethical considerations in AI-assisted learning environments. The implementation of this approach demonstrates that this community service program contributed to the development of a responsible digital culture among university students. Furthermore, students developed awareness that Artificial Intelligence should function as a supportive tool that enhances human capabilities rather than replacing human critical thinking and creativity.

The findings further reveal that the hybrid learning approach effectively supported the development of students' digital competencies and technological adaptability. Previous studies have emphasized that hybrid learning is effective when technology integration aligns with pedagogical objectives, supports collaborative learning, and provides authentic learning experiences (Lymperis, 2021). In this activity, the combination of face-to-face sessions and online learning activities provided students with flexibility to access materials, participate in discussions, and independently explore AI technologies at their own pace. These findings align with Menggo and Darong (2022), who explain that hybrid learning models can improve ICT literacy, learner motivation, and technology-related competencies when supported by appropriate instructional design. The hybrid model used in this program also facilitated dynamic interaction between instructors and students through synchronous discussions, practical workshops, and online engagement. As a result, students experienced not only conceptual learning but also active participation in digital learning ecosystems similar to those increasingly implemented in higher education institutions worldwide. Moreover, the use of hybrid training reflects the growing need for universities to adopt flexible, technology-enhanced learning strategies that support student-centered education in the Society 5.0 era. Therefore, the findings indicate that hybrid AI literacy training has strong potential to support the sustainable development of digital competency among university students.

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Another important finding from this community service activity relates to the contribution of AI literacy training to students' readiness for AI-integrated educational and professional environments. Society 5.0 positions humans as the central actors in technological innovation while emphasizing collaboration between humans and intelligent systems in various aspects of life (Ally & Perris, 2022; Mykhaylenko et al., 2024). In this context, the training program introduced students to practical examples of AI implementation across academic and professional sectors, enabling them to better understand the competencies required in future workplaces. The activity contributed to developing students' awareness regarding the importance of digital literacy, technological adaptability, and responsible AI utilization in responding to rapidly evolving technological changes. These findings are consistent with those of Mykhaylenko et al. (2024), who emphasize that future workforce readiness requires competencies in digital literacy, ethical AI use, and data-informed decision-making. Students participating in this activity demonstrated strong enthusiasm for learning AI technologies, recognizing the relevance of AI competencies to future employment opportunities and professional development. Consequently, the findings suggest that AI literacy training can function as an effective strategy for improving students' technological readiness, employability, and competitiveness in the AI-driven Society 5.0 environment.

The findings also address the primary problem formulation of this community service activity: how hybrid training can improve university students' Artificial Intelligence literacy to support Society 5.0 competencies. Based on the implementation process, it can be analyzed that improvements in students' AI literacy occurred through the integration of conceptual instruction, practical AI workshops, interactive discussions, and guided technological exploration activities. Such an approach enabled students to gain theoretical and practical learning experiences closely aligned with contemporary educational and technological contexts. In addition, the hybrid learning model facilitated students' adaptation to digital learning environments by allowing them to experience technology-based educational practices directly throughout the training sessions. These findings demonstrate that the effectiveness of AI literacy development is influenced not only by the instructional materials provided but also by the learning methods and technological environments implemented during the training process. Hybrid training created a more flexible, interactive, and participatory learning environment that encouraged students to actively explore and understand AI technologies. Consequently, the findings indicate that hybrid AI literacy training can effectively improve students' understanding, technological skills, and readiness to utilize Artificial Intelligence responsibly and productively within Society 5.0 educational environments.

From the perspective of community service practices, this activity contributes to the development of digital literacy empowerment programs that are relevant to contemporary higher education needs. The program demonstrates that AI literacy initiatives based on hybrid learning can serve as practical models for strengthening university students' technological competencies in response to digital transformation. Furthermore, the findings highlight the importance of collaboration between higher education institutions and technological developments in building educational ecosystems capable of supporting the Society 5.0 transformation. Previous studies emphasize that successful AI integration in education requires curriculum development, institutional support, digital infrastructure, and continuous human resource capacity building (Ally & Perris, 2022; Domínguez Figaredo & Stoyanovich, 2023). In this context, the present activity represents a practical implementation of AI literacy development in higher education through participatory, student-centered learning approaches. The training also demonstrated that students require learning environments that combine theoretical understanding, practical technological experience, and ethical discussions regarding AI utilization in academic and professional settings. Therefore, this community service activity contributes not only to students' digital competency development but also to the broader implementation of technology-oriented educational innovation in higher education institutions.

The practical implications of the activity findings indicate that AI literacy development should be implemented continuously through integrated training programs, curriculum innovation, and the strengthening of digital culture in higher education institutions. A single training session is insufficient to fully develop comprehensive AI competencies

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because AI technologies continue to evolve rapidly. Consequently, follow-up programs, advanced workshops, and sustainable AI literacy initiatives are required to support students' long-term competency development. In addition, the findings reveal the importance of digital infrastructure readiness, educator preparedness, and technological accessibility in ensuring the effectiveness of hybrid AI literacy programs. These findings align with Ainin and Bauyot (2024), who emphasize that the success of technology integration in education depends significantly on institutional readiness, technological infrastructure, and educators' ability to integrate digital tools effectively into teaching practices. In terms of sustainability, this community service program can be expanded through the development of discipline-specific AI literacy modules, interdisciplinary training activities, and broader implementation involving students from various academic departments. Such initiatives may help create more inclusive and sustainable digital competency ecosystems in higher education. Thus, the findings imply that hybrid AI literacy training is strategically important in supporting higher education's adaptation to technological transformation and Society 5.0 demands.

Despite the positive contributions identified in this activity, several limitations should also be acknowledged. One of the primary limitations concerns the scope and duration of the training, which primarily focused on introducing basic AI literacy concepts and practical applications rather than advanced AI development competencies. Additionally, the effectiveness of the hybrid learning model was influenced by participants' varying levels of digital readiness, technological access, and internet connectivity. Previous studies have highlighted that infrastructure limitations, unequal technological access, and differences in ICT competencies may affect the effectiveness of blended learning implementations (D. Ainin, MAED & M. Bauyot, PhD, 2024; Lymperis, 2021). Similar challenges were observed during the implementation of this community service activity, as not all participants had equal technological resources or digital learning experiences. Moreover, the rapid evolution of Artificial Intelligence technologies requires continuous updates to training materials and instructional approaches to ensure ongoing relevance. Therefore, future programs should consider developing more advanced, systematic, and sustainable AI literacy initiatives that can provide deeper technological competencies and broader institutional impacts. Nevertheless, the overall findings from this community service activity demonstrate that hybrid Artificial Intelligence literacy training is highly relevant and makes significant contributions to supporting university students' competency development in the Society 5.0 era.

### 3.1. Results

The community service program entitled "Improving Students' Artificial Intelligence Literacy through Hybrid Training in Supporting Society 5.0 Competencies" was attended by 34 university students from various academic backgrounds. The activity was conducted using a hybrid learning approach that combined face-to-face workshops and online learning sessions. The evaluation process used pre- and post-test instruments to measure participants' cognitive improvement in Artificial Intelligence literacy, ethical AI use, and practical AI implementation in academic contexts. A table view is shown in Table 1.

**Table 1.** Descriptive Statistics of Pre-Test and Post-Test Scores (n = 34)

| Statistical Indicator | Pre-Test | Post-Test |
|---|---|---|
| Mean | 58.24 | 84.76 |
| Median | 59.00 | 85.00 |
| Standard Deviation | 8.31 | 6.42 |
| Minimum Score | 42 | 70 |
| Maximum Score | 74 | 96 |
| Gain Score | - | 26.52 |
| Percentage Increase | - | 45.54% |

The statistical findings demonstrate a substantial increase in students' understanding of Artificial Intelligence concepts after participating in the hybrid training program. The average post-test score increased from 58.24 in the

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pre-test to 84.76 in the post-test, indicating that the training successfully improved participants' AI literacy competencies.

**Table 2.** Data of Participants' Pre-Test and Post-Test Scores

| Participant | Pre-Test | Post-Test | Gain |
|---|---|---|---|
| P1 | 55 | 82 | 27 |
| P2 | 60 | 86 | 26 |
| P3 | 52 | 80 | 28 |
| P4 | 64 | 88 | 24 |
| P5 | 58 | 85 | 27 |
| P6 | 61 | 90 | 29 |
| P7 | 49 | 76 | 27 |
| P8 | 57 | 84 | 27 |
| P9 | 63 | 91 | 28 |
| P10 | 54 | 81 | 27 |
| P11 | 56 | 83 | 27 |
| P12 | 62 | 89 | 27 |
| P13 | 47 | 74 | 27 |
| P14 | 65 | 92 | 27 |
| P15 | 59 | 86 | 27 |
| P16 | 51 | 78 | 27 |
| P17 | 60 | 87 | 27 |
| P18 | 66 | 94 | 28 |
| P19 | 53 | 80 | 27 |
| P20 | 57 | 84 | 27 |
| P21 | 62 | 90 | 28 |
| P22 | 48 | 75 | 27 |
| P23 | 55 | 82 | 27 |
| P24 | 61 | 88 | 27 |
| P25 | 58 | 85 | 27 |
| P26 | 63 | 91 | 28 |
| P27 | 50 | 77 | 27 |
| P28 | 56 | 83 | 27 |
| P29 | 67 | 95 | 28 |
| P30 | 59 | 86 | 27 |
| P31 | 52 | 79 | 27 |
| P32 | 64 | 92 | 28 |
| P33 | 57 | 84 | 27 |
| P34 | 60 | 88 | 28 |

Table 2 presents the pre-test and post-test scores of 34 participants involved in the hybrid Artificial Intelligence literacy training program. The results indicate consistent improvement in participants' understanding of AI concepts after the intervention. Most participants achieved gains of 27-28 points, demonstrating the effectiveness of the training in enhancing students' digital competencies and AI literacy.

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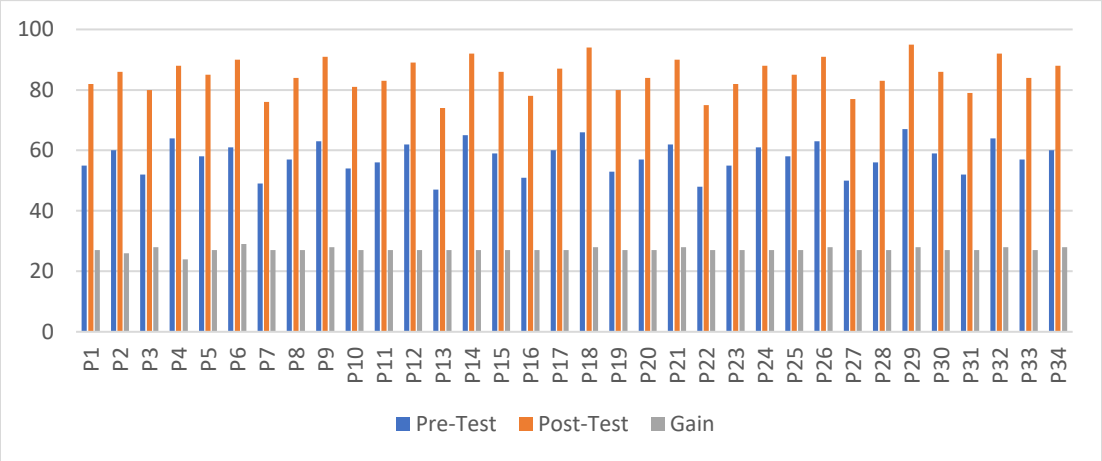


**Figure 2.** Scatter Plot and Regression Analysis of Pre-Test and Post-Test Scores

The charts show a positive regression trend between pre-test and post-test scores, indicating that participants with moderate AI literacy levels initially experienced consistent improvements after the hybrid training program was implemented. The upward pattern demonstrates that the intervention effectively strengthened students' cognitive understanding of Artificial Intelligence concepts and their practical applications.

**Table 3.** Indicators of Program Success

| Indicator | Target | Achievement | Status |
|---|---|---|---|
| Participant Attendance | ≥80% | 94% | Achieved |
| Improvement in Test Scores | ≥25% | 45.54% | Achieved |
| Active Participation | ≥75% | 91% | Achieved |
| AI Practice Completion | ≥80% | 88% | Achieved |
| Participant Satisfaction | ≥80% | 93% | Achieved |

The indicators reveal that the program achieved all predetermined targets. High participation and completion rates indicate strong student engagement throughout the hybrid training activities.

### 3.2. Cognitive Impact Analysis

The cognitive impact of the training program was reflected in students' improved understanding of AI concepts, algorithmic thinking, digital ethics, and AI-assisted academic problem solving. Participants demonstrated increased confidence in using AI platforms for academic writing, information retrieval, and learning support. The substantial increase in post-test scores suggests that the training successfully enhanced students' digital competencies and conceptual knowledge regarding Artificial Intelligence applications in higher education.

### 3.3. Behavioral Impact Analysis

From a behavioral perspective, the program encouraged students to adopt more responsible and critical attitudes toward the use of AI. During the training sessions, participants demonstrated greater awareness of the importance of verifying AI-generated information, avoiding plagiarism, and maintaining academic integrity when using generative AI tools. Students also demonstrated higher participation levels in collaborative discussions and technology-based learning activities. These findings indicate that the hybrid training approach positively influenced students' digital behavior and ethical awareness in AI-supported learning environments.

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### 3.4. Economic and Productivity Impact Analysis

The training also produced practical economic and productivity-related impacts. Students reported that AI technologies helped reduce the time required to complete academic assignments, organize information, and generate learning materials. The use of AI-assisted tools increased efficiency in academic activities and enabled students to manage learning tasks more effectively. Although the activity primarily focused on educational outcomes, the findings suggest that AI literacy competencies may contribute to future workforce readiness and enhanced productivity in technology-driven professional environments.

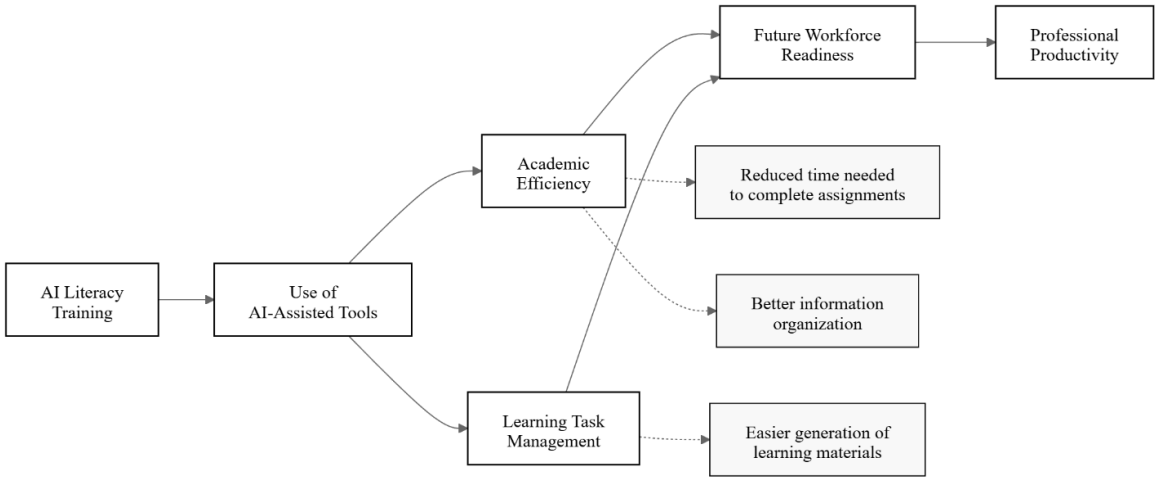


**Figure 3.** Economic and Productivity Impacts of AI Literacy Training

### 3.5. Documentation

Face-to-face workshop session involving practical AI demonstrations, participant discussions, and collaborative learning activities.

**Figure 4.** Hybrid AI Literacy Training Activities

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Screenshot of online hybrid training sessions showing participant engagement and attendance during AI literacy workshops.


**Figure 5.** Online Training and Participant Attendance Documentation

Documentation of students practicing AI-based applications for academic tasks and digital literacy development.

**Figure 6.** Participant Practice and AI Application Demonstration

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DOI: https://doi.org/10.62712/juribmas.v5i1.1038

### 3.6. Discussion

The findings indicate that hybrid Artificial Intelligence literacy training significantly improved students' cognitive understanding of AI technologies in academic contexts. The increase in average post-test scores demonstrates that the hybrid learning approach successfully facilitated conceptual understanding, practical AI application, and ethical awareness among university students. These findings support previous studies emphasizing that AI literacy is a multidimensional competency encompassing technological knowledge, critical thinking, ethical reasoning, and responsible digital practices (Chee et al., 2025; Farrelly & Baker, 2023; Salhab, 2024). Through a combination of face-to-face workshops and online learning activities, students experienced flexible, interactive learning environments that encouraged active engagement with AI technologies. The integration of synchronous and asynchronous learning activities enabled participants to independently explore AI platforms while still receiving direct instructional guidance during training sessions. Consequently, the hybrid model not only improved technological understanding but also promoted learner autonomy and digital adaptability in the Society 5.0 educational environment.

## 4. CONCLUSION

The community service program on improving university students' Artificial Intelligence literacy through hybrid training demonstrated that AI literacy is an essential competency for supporting students' readiness in the Society 5.0 era. The implementation of hybrid learning, combining face-to-face and online instructional approaches, successfully facilitated students' understanding of AI concepts, practical AI use, and ethical awareness of the responsible use of digital technologies in academic contexts. The activity also revealed that hybrid training provided flexible, interactive, and technology-oriented learning experiences that encouraged active student participation and strengthened the development of digital competencies. Furthermore, the program enhanced students' adaptability to technological transformation and increased their awareness of the importance of AI competencies for future academic and professional environments. The findings indicate that AI literacy development should not be limited to technical knowledge alone but should also include critical thinking, ethical reasoning, and the ability to evaluate AI-generated information responsibly. In addition, the implementation of this activity highlighted the importance of sustainable AI literacy initiatives, institutional support, digital infrastructure readiness, and continuous technological training in higher education. Therefore, hybrid AI literacy training can serve as a relevant and effective model for supporting higher education transformation and preparing students to become adaptive, innovative, and responsible individuals in the rapidly evolving digital ecosystem of Society 5.0.

## 5. ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to all participants who actively contributed to implementing the community service program entitled "Improving Students' Artificial Intelligence Literacy through Hybrid Training in Supporting Society 5.0 Competencies." Appreciation is also extended to the university authorities, organizing committee, and supporting institutions for providing facilities, technical support, and collaborative assistance throughout the implementation of the program. The authors further acknowledge all students, facilitators, and academic partners for their participation and enthusiasm, which contributed significantly to the success of this activity. Finally, the authors appreciate the valuable support and encouragement from all parties involved in promoting digital literacy and Artificial Intelligence education in higher education environments.

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**e-ISSN: 2961-7286 | p-ISSN: 2962-3677**
**Volume 5 No 1 Juli 2026 | Page: 246-258**
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