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Improving Digital Competence of Tourism Academics and Professionals Through AI-Based Workshops in Indonesia and Vietnam

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Abstract - *This international community service program, jointly organized by Politeknik Negeri Bandung (Polban) and Duy Tan University (DTU), aimed to enhance the digital competencies of academics and tourism professionals in Indonesia and Vietnam. The activities included mapping digital transformation needs, conducting AI-based capacity-building workshops, and evaluating tourism-related curricula to promote digital readiness. A total of 449 participants were involved, utilizing a participatory approach with experiential learning methods. Workshops were held in Vietnam (19–20 August 2025) and Indonesia (15 October 2025), focusing on the application of Artificial Intelligence (AI) in tourism analytics and digital content creation. The outcomes showed increased understanding of AI tools among participants and led to revised curriculum frameworks that integrate digital competencies. This international collaboration offers a replicable model for building digital capacity and fostering a more inclusive and sustainable tourism ecosystem in Southeast Asia.*

Keywords: *Artificial Intelligence, Digital Competence, Tourism Education, International Collaboration, Southeast Asia*

Abstrak – Program pengabdian masyarakat internasional antara Politeknik Negeri Bandung (Polban) dan Duy Tan University (DTU) bertujuan untuk meningkatkan kompetensi digital akademisi dan profesional pariwisata di Indonesia dan Vietnam. Kegiatan ini mencakup pemetaan kebutuhan transformasi digital, pelatihan berbasis kecerdasan buatan (AI), serta evaluasi kurikulum mata kuliah pariwisata menuju kesiapan digital. Sebanyak 449 peserta terlibat dalam kegiatan ini, dengan pendekatan partisipatif yang mengedepankan pelatihan berbasis pengalaman. Lokakarya dilaksanakan di Vietnam (19–20 Agustus 2025) dan Indonesia (15 Oktober 2025), dengan fokus pada penggunaan AI untuk analisis pariwisata dan pengembangan konten digital. Hasil kegiatan menunjukkan peningkatan pemahaman peserta terhadap pemanfaatan AI, serta tersusunnya rancangan kurikulum baru yang mengintegrasikan kompetensi digital. Kolaborasi lintas negara ini menjadi model penguatan kapasitas digital yang mendukung ekosistem pariwisata berkelanjutan dan inklusif di Asia Tenggara.

Kata Kunci: Kecerdasan Buatan, Kompetensi Digital, Pendidikan Pariwisata, Kolaborasi Internasional, Asia Tenggara

1. INTRODUCTION

Digital transformation has significantly reshaped the global tourism industry by altering how destinations are managed and how tourists engage with services. The integration of Artificial Intelligence (AI), big data, and digital marketing strategies has empowered tourism stakeholders to improve operational efficiency, expand their market reach, and offer personalized services that align with evolving traveler preferences [1,2]. Through tools such as AI-driven chatbots, automated recommendations, and data-informed decision-making systems, tourism providers have enhanced both the customer experience and destination competitiveness [3,4].

However, despite its recognized benefits, digital transformation faces significant barriers in emerging economies such as Indonesia and Vietnam, where disparities in digital infrastructure and human capital readiness persist [5,6]. In Southeast Asia, tourism plays a crucial role in economic development and cross-cultural engagement. Nevertheless, unequal levels of digital maturity across the region hinder the scalability and inclusivity of tech-driven tourism initiatives [7]. Many small, and medium-sized tourism enterprises (SMEs) still rely on conventional management and promotional strategies, lacking the capacity to adopt AI or data analytics to enhance operations. This digital gap is also evident in academic and professional

environments, where insufficient exposure to technological innovations leads to a mis-alignment between industry demands and the competencies offered by higher education institutions [8].

To address these gaps, a collaborative international community service initiative was launched by Politeknik Negeri Bandung (Polban), Indonesia, and Duy Tan University (DTU), Vietnam. This initiative is structured around three core activities: (1) mapping digital readiness and transformation needs among academics and tourism practitioners; (2) delivering AI-based training workshops to develop digital competencies; and (3) evaluating and improving tourism syllabi by embedding digital literacy, AI applications, and Big Data analytics. The integration of AI into tourism practices in Indonesia, particularly among travel agents and destination managers, remains limited and requires focused capacity-building [9].

2. METHOD

This international community service program applied a participatory action research (PAR) approach to enhance digital competencies among academics and tourism professionals in Indonesia and Vietnam. Recent studies advocate for agile frameworks that involve stakeholders in the transformation process, increasing engagement and long-term adoption [10,11]. Embracing such frameworks has been shown to foster stronger user commitment — an essential element of seamless digital transformation [12].

The collaboration between Politeknik Negeri Bandung (Polban) and Duy Tan University (DTU) took place from March to October 2025. The activities were framed within three interconnected phases that focused on needs mapping, AI-based capacity building, and curriculum development, forming a cycle of continuous reflection and improvement aligned with the ethos of community-based engagement.

Research Design and Implementation

The program was designed as a multi-phase initiative that integrated both quantitative and qualitative methods. In its initial phase, the program focused on assessing the level of digital readiness and transformation needs among lecturers, students, and tourism practitioners. This mapping phase enabled the identification of competency gaps, infrastructure barriers, and institutional readiness, which informed the program's next steps.

The second phase was centered on capacity building through AI-based training and simulation workshops. These workshops were not only designed to transfer digital knowledge but also to offer hands-on experience using AI tools relevant to tourism education and professional practices. The final phase of the program involved evaluating and enhancing existing tourism syllabi to embed AI literacy, digital content creation, and data analysis skills.

Participants and Data Collection

Participants in this initiative included a diverse group of stakeholders, including lecturers, students, and tourism professionals from both countries. A total of 612 individuals completed the digital survey, yielding 449 valid responses for analysis. The respondents were categorized by discipline: 256 from tourism-related fields and 193 from non-tourism backgrounds.

Data collection involved a mixed-method approach combining online surveys and participatory observations. The instrument, available in Bahasa Indonesia, English, and Vietnamese, measured key indicators such as self-readiness, system quality, institutional support, and perceived AI usage. Prior to dissemination, the questionnaire underwent validation through focus group discussions (FGDs) involving academic teams from both institutions. In addition, secondary data were obtained from institutional reports and local tourism agencies to enrich contextual understanding.

Training Activities

Following the needs mapping phase, training workshops were conducted in both countries to improve participants' digital skills in applied settings. In Vietnam, the workshop was held in Da Nang on 19–20 August 2025. This session emphasized the use of AI tools in tourism analytics, content creation, and virtual destination storytelling. Participants practiced using platforms such as ChatGPT, Scite.ai, and other AI applications to develop data-driven narratives and marketing assets.

The Indonesian workshop was held in Bandung on 15 October 2025, focusing on integrating AI into tourism education. Lecturers were guided to revise their course plans (Rencana Pembelajaran Semester or RPS) by incorporating AI-supported learning activities and case-based simulations, particularly in courses such as Community-Based Tourism, Tourism Marketing, and Tourism Information Systems. Both workshops were conducted using bilingual instruction and were co-facilitated by

trainers from both Polban and DTU to ensure inclusivity in pedagogy and cultural relevance.

Curriculum Review and Development

The third phase aimed to evaluate and strengthen syllabus components related to digital transformation. Academic teams from both institutions exchanged course outlines and *Rencana Pembelajaran Semester* (RPS) documents, or syllabi, to identify integration points for AI and Big Data. A series of FGDs—conducted both online and on-site—were used to analyze gaps between the existing syllabus and digital industry requirements. The discussions produced a draft of syllabus recommendations focusing on AI-based tourism analytics, digital marketing simulation, and data literacy modules.

Data Analysis

The analysis of survey responses was conducted using Partial Least Squares–Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0. This quantitative method allowed the team to identify the relationships among variables such as readiness, institutional support, and AI utilization. To complement the statistical analysis, qualitative data from FGDs and reflective notes from workshop sessions were thematically coded using Atlas.ti 23. A Multi-Group Analysis (MGA) was also applied to examine contrasts between tourism and non-tourism respondents, particularly regarding their approach to digital adoption.

This mixed-methods approach ensured that the program's outcomes were both measurable and grounded in participants' lived experiences. It also reinforced the value of international academic cooperation as a catalyst for sustainable, digitally enabled transformation in higher education and professional practice.

3. RESULT AND DISCUSSION

The implementation of the international community service program between Politeknik Negeri Bandung (Polban) and Duy Tan University (DTU) yielded both quantitative and qualitative outcomes, demonstrating tangible progress in the digital transformation of tourism education and professional practice. This section presents four key components of the outcomes: survey findings from the digital readiness mapping, comparative analysis between Indonesia and Vietnam, evaluation of the AI-based training workshops, and curriculum development efforts. Collectively, these findings reflect how participatory learning and international collaboration can effectively foster digital readiness across academic and industry environments.

Digital Readiness and AI Utilization

The first phase of this community service initiative focused on assessing the level of digital readiness among academics and tourism professionals in Indonesia and Vietnam. A multi-country online survey yielded 449 valid responses, comprising participants from both tourism-related disciplines (n = 256) and non-tourism fields (n = 193). Respondents included lecturers, students, and practitioners from higher education institutions and tourism industries in both countries.

To analyze the data, the research team employed Partial Least Squares–Structural Equation Modeling (PLS-SEM) using SmartPLS 4.0. The model evaluated five latent constructs: self-readiness, system quality, institutional support, AI utilization, and learning effectiveness. Tests of reliability and validity (Cronbach's $\alpha > 0.70$; AVE > 0.50) confirmed that the measurement model met acceptable standards.

The structural model revealed that self-readiness and system quality were the most significant predictors of AI utilization, while institutional support had an indirect influence through its impact on user readiness. The model also demonstrated that AI utilization contributed positively to learning outcomes and academic performance. The path coefficients and significance values were as follows: 1) Self-Readiness → AI Utilization: $\beta = 0.141$, $p < 0.05$; 2) System Quality → AI Utilization: $\beta = 0.268$, $p < 0.01$; 3) AI Utilization → Learning Effectiveness: $\beta = 0.684$, $p < 0.001$; 4) AI Utilization → Academic Performance: $\beta = 0.697$, $p < 0.001$. The coefficient of determination (R^2) for AI Utilization was 0.62, indicating that the combination of user readiness, system quality, and institutional support accounted for 62% of the variance in AI adoption among participants.

These findings align with previous studies suggesting that digital competence and technology acceptance are influenced by individual psychological readiness and environmental conditions. Furthermore, they underline the ongoing challenge of unequal access to reliable digital infrastructure—an issue that continues to affect the pace of transformation in several parts of Southeast Asia.

These insights highlight the importance of contextualized training, as emphasized in recent literature on adaptive and personalized learning strategies [13]. These findings informed the development of targeted training modules

designed to promote contextual learning and adaptive pedagogy. The use of AI in tourism education not only supports greater personalization but also enhances operational efficiency and consumer satisfaction — factors essential for competitiveness in the tourism sector [14].

Comparative Insights: Indonesia and Vietnam Contexts

a. Cross-Country Comparison

To explore differences between the two participating countries, a Multi-Group Analysis (MGA) was conducted based on the survey results. The analysis uncovered distinct differences in perceptions of digital readiness. Respondents from Indonesia exhibited relatively higher levels of self-confidence in adopting Artificial Intelligence (AI), suggesting a strong willingness to engage with new technologies. However, this optimism was tempered by lower perceptions of system quality, reflecting underlying concerns related to infrastructure reliability and institutional support.

Conversely, Vietnamese respondents reported more favorable assessments of system performance and institutional backing. These perceptions are likely influenced by Vietnam's significant recent investments in digital transformation, particularly in the higher education sector. The National Digital Transformation Program 2025 has emphasized integrating AI-assisted learning platforms and cloud-based academic systems, thereby enhancing the perceived quality of digital infrastructure in educational environments.

In contrast, Indonesian participants expressed strong interest in utilizing AI tools but noted several persistent challenges. These included limited access to data analytics software, unstable internet connectivity, and inconsistent availability of structured training programs. Such technical and logistical barriers hinder the full realization of AI's potential in academic and professional contexts.

b. Field-Specific Differences

When examined by academic discipline, the data revealed that participants from tourism-related fields demonstrated higher engagement with AI tools (mean score = 4.21 out of 5) compared to those from non-tourism backgrounds (mean score = 3.74). This difference may reflect the tourism sector's greater exposure to digital innovations such as virtual tours, AI-powered customer analytics, and targeted digital marketing.

Despite this higher engagement, qualitative feedback revealed that many tourism academics still use AI in a limited or passive manner. Common applications included text translation, grammar correction, or basic content enhancement—functions that, while useful, fall short of strategic, data-driven applications in learning and teaching. This suggests the presence of a "partial adoption phenomenon," in which AI is acknowledged and used, but not yet embedded into deeper pedagogical or operational practices.

To move beyond this limited use, institutions must support a broader cultural shift that fosters data-informed thinking and strategic integration of AI into academic routines. This transition requires not only skills training but also curriculum reform, institutional support, and leadership backing to ensure long-term sustainability of AI adoption (Buhalis & Amaranggana, 2015; World Economic Forum, 2024).

Training Outcomes: AI-Based Capacity Building

The second phase of the program was dedicated to strengthening digital competencies through two international workshops that applied experiential and simulation-based learning approaches. These workshops were designed not only to transfer knowledge about Artificial Intelligence (AI) but also to provide hands-on practice using AI tools in educational and professional tourism contexts.

In this regard, the program's alignment with behavioral insights and institutional support strategies in order to reinforces the growing acknowledgment of AI's transformative role in tourism development. By centering training on practical, context-based applications, the initiative contributes to sustainable, digitally empowered tourism ecosystems [15].

a. Workshop in Da Nang, Vietnam (19 and 20 August 2025)

This workshop (**Figure 1**), hosted by Duy Tan University, targeted students and early-career professionals in tourism and hospitality management. The sessions were designed to introduce participants to practical applications of AI in tourism, focusing on three main areas: the use of AI for tourism data analytics using publicly available datasets to understand traveler behavior; digital content creation, including automated image generation and captioning for tourism marketing; and virtual experience design, which involved the integration of AI chatbots into simulated tour environments.

Figure 1. Workshop in Vietnam

Participants engaged directly with platforms such as ChatGPT, Scite.ai, Canva AI, and Google Gemini. These tools were used in group-based projects in which participants analyzed tourist satisfaction data and translated their insights into digital content. Evaluation surveys conducted after the workshop revealed that 87% of participants reported an increased understanding of AI concepts, and 82% expressed higher confidence in using AI for research and creative purposes. Reflections gathered through informal interviews and feedback forms also highlighted that the bilingual facilitation (English–Vietnamese) and interactive learning environment significantly enhanced participant engagement and comprehension.

b. Workshop in Bandung, Indonesia (15 October 2025)

The second workshop (**Figure 2**) was held at Politeknik Negeri Bandung and focused on integrating AI tools into formal tourism education. Unlike the Vietnam workshop, which targeted students, this session primarily involved lecturers and senior students enrolled in tourism-related programs. The workshop, titled "Integrating AI in Tourism Courses," explored three curriculum areas: Community-Based Tourism (CBT), Tourism Marketing, and Tourism Information Systems.

Figure 2. Workshop in Indonesia

As part of the training, lecturers collaborated to redesign their Rencana Pembelajaran Semester (RPS) by embedding AI-supported activities into teaching plans. These included generating market segmentation insights using natural language processing tools, designing predictive AI-based itineraries for sustainable tourism, and applying conversational AI to simulate virtual mentoring environments. Through these innovations, lecturers were encouraged to move beyond theoretical instruction toward more data-driven, applied teaching methods.

Additionally, students took part in a mini-project competition that challenged them to create AI-powered promotional campaigns for local destinations in West Java. The top three projects were later adopted as case studies in class discussions and used as model examples in future coursework.

Post-training evaluations (n = 55) showed a notable increase in participants' AI self-efficacy, with an average improvement of 0.84 points on a 5-point Likert scale. Participant testimonials described the training as "transformative" and "directly applicable," especially for improving teaching strategies, student engagement, and creativity in digital tourism content development.

Subject Evaluation and Discussion

The third phase of the program centered on the evaluation and development of academic subjects, forming a critical intellectual foundation for the sustainability of the collaboration between Polban and DTU. This phase emphasized the need to systematically embed Artificial Intelligence (AI) and data literacy components into the tourism curricula of both institutions, aligning educational content with industry transformation trends.

a. Syllabus Mapping

Initial reviews of course documents revealed that AI-related content was limited and primarily present in elective courses. There was minimal integration of AI topics in core curriculum structures. To address this, academic teams from both institutions conducted bilateral consultations and engaged in three focus group discussions (two held virtually and one in a hybrid format). These sessions aimed to align existing learning outcomes with the evolving demands of the tourism industry, particularly in digital skills and AI readiness.

The syllabus mapping process revealed several key gaps: the lack of analytical competencies, limited exposure to the ethical

dimensions of AI in tourism, and the absence of structured project-based collaboration practices. These findings highlighted the urgency of curriculum reform to ensure that graduates possess relevant digital competencies that align with the technological advancements reshaping the tourism sector.

Ultimately, the Polban–DTU collaboration presents a viable model for international academic partnership that bridges skills gaps between academia and industry, while also nurturing inclusive and sustainable digital ecosystems. Through syllabus reform and real-world AI application in tourism education, this initiative advances the broader Southeast Asian vision of smart, competitive, and digitally integrated societies [16,17].

b. Collaborative Subject Enhancement

In response to the identified gaps, both institutions developed a set of joint recommendations to improve the subject. First, they proposed the introduction of a new elective course titled "AI for Tourism", covering essential topics such as digital marketing analytics, big data visualization, and introductory machine learning tailored for non-engineering students.

Second, AI modules were proposed for embedding in existing core courses, including Tourism Policy, E-Business in Tourism, and Destination Management Systems. These integrations aimed to promote a deeper understanding of how AI intersects with tourism operations, governance, and consumer engagement.

Third, the institutions developed case-based assignments that required students to apply AI tools for analyzing visitor reviews, simulating customer service interactions, and generating strategic recommendations based on data insights.

Finally, to ensure the long-term sustainability of this curriculum transformation, the program encouraged co-teaching schemes and academic exchange between Polban and DTU lecturers. These collaborative teaching practices are designed to foster knowledge sharing, innovation, and international classroom exposure, thereby enriching both student learning and faculty professional development.

This curriculum co-development process (**Figure 3**) reflects a broader global movement toward syllabus hybridization, where technological skills are integrated with human-centered pedagogical approaches to prepare students for the digital economy [3,16].

Figure 3. Signing the MOU

c. Reflection on Community Empowerment Impact

Beyond academic outcomes, the third phase also demonstrated clear impacts on community empowerment. Several lecturers and students who had participated in the AI workshops initiated local training programs within tourism communities in Bandung and Da Nang. These sessions covered practical topics such as digital storytelling with AI, social media branding for small tourism enterprises, and basic digital marketing using AI-enhanced platforms.

This multiplier effect represents a cascading model of knowledge transfer, where trained individuals extend the program's benefits to wider community stakeholders. The approach aligns with the national vision of "Kampus Berdampak" — a university model that emphasizes measurable societal impact through education and community service.

Furthermore, the institutional collaboration was formally reinforced through the signing of a Memorandum of Understanding (MoU) and a Joint Community Services Agreement between Polban and DTU. These agreements mark a commitment to sustain the partnership beyond the 2025 program timeline and provide a framework for future cross-border initiatives in digital education and tourism innovation.

Interpretation and Broader Implications

The findings of this initiative affirm that the adoption of Artificial Intelligence (AI) in tourism education is influenced not only by technological access and infrastructure, but also by the readiness of pedagogical approaches and institutional mindsets. While Vietnam demonstrates relatively stronger infrastructural readiness through national policies and investments in digital education, Indonesia presents fertile ground for community-based

digital innovation, especially in the context of applied tourism practices. The collaboration between these two nations thus enables the creation of a synergistic learning ecosystem—one that strengthens mutual adaptability and fosters shared growth through cross-institutional engagement.

From a theoretical perspective, the results lend strong support to the Technology–Organization–Environment (TOE) framework and the Human–Organization–Technology Fit (HOT-Fit) model. Both highlight the critical roles of self-readiness and institutional support in enabling technology acceptance, particularly in academic environments transitioning toward digitalization [9,18]. These frameworks help explain the success of participatory and context-sensitive strategies employed throughout this program.

On a practical level, the outcomes align with the ASEAN Digital Masterplan 2025's strategic vision, particularly its emphasis on strengthening digital human capital as the foundation for regional tourism competitiveness. By focusing on capacity building through AI-based workshops and curriculum reform, the program actively contributes to ASEAN's goals of equitable, inclusive, and innovation-driven growth in the tourism sector.

Importantly, the integration of AI into higher education should be viewed not only as a technological upgrade but also as a cultural shift. This shift involves reorienting educators and students toward data-informed decision-making, ethical use of emerging technologies, and interdisciplinary collaboration across academia, industry, and community sectors.

The Polban–DTU partnership illustrates how community service programs—when designed with research-informed strategies and rooted in international cooperation—can produce long-term benefits that transcend institutional boundaries. By combining empirical inquiry, real-world application, and curriculum transformation, this initiative provides a scalable model for other Southeast Asian institutions seeking to bridge the digital divide and respond to the rapid evolution of tourism in the digital era.

In conclusion, the program's integrated outputs—from survey findings and workshop impacts to curriculum innovation—demonstrate that targeted AI training and cross-border academic collaboration can drive inclusive digital transformation. This applied model of community engagement offers valuable insights for future initiatives aiming to harmonize technological advancement with educational empowerment across the region.

Limitation

Despite the program's notable achievements in enhancing digital competencies among academics and tourism professionals, several limitations should be acknowledged to contextualize its scope and applicability.

First, the study employed a cross-sectional survey design, with data collected over a limited period from March to May 2025. This temporal constraint restricts the ability to draw causal inferences or to observe long-term changes in participants' digital readiness and AI-related behaviors. A longitudinal approach in future programs would be valuable to capture the sustained impact of interventions, including changes in pedagogical practices and the continued integration of AI tools in professional settings.

Second, the data relied heavily on self-reported responses, which may be subject to bias, particularly in relation to social desirability or overestimation of one's digital competence. Although the research team employed triangulation methods through focus group discussions and direct observation during training activities, the potential for perceptual bias cannot be eliminated.

Third, the composition of respondents was skewed toward academic participants, with fewer industry practitioners represented in the dataset. This uneven distribution may limit the generalizability of the findings, especially for small and medium-sized enterprises (SMEs) in the tourism sector, which often face more pronounced challenges with digital adoption. Future initiatives would benefit from actively involving a broader range of stakeholders, including community-based tourism actors, local entrepreneurs, and informal tourism networks.

Lastly, logistical differences between the two countries—including academic calendar misalignments, language barriers, and differing institutional policies—posed coordination challenges throughout the program. While mitigated through hybrid facilitation methods and bilingual instructional materials, these factors suggest the importance of adopting more flexible timelines, modular training formats, and adaptive delivery strategies in future international community service programs.

By recognizing these limitations, future collaborations can be better designed to ensure broader participation, richer data collection, and

more sustainable digital transformation outcomes across diverse tourism contexts.

4. CONCLUSION

The international community service collaboration between Politeknik Negeri Bandung (Polban) and Duy Tan University (DTU) has demonstrated that meaningful digital transformation in tourism education requires more than the introduction of technology alone. It necessitates a strategic combination of human readiness, institutional support, and cross-border academic partnership. Through a structured approach involving digital needs mapping, AI-based training workshops, and collaborative syllabus evaluation, the program significantly enhanced the digital competencies of academics and students in both Indonesia and Vietnam.

In summary, the collaboration between Polban and DTU stands as a replicable model of international community service that bridges academic research, education, and societal impact. By integrating AI into both formal education and community engagement, the program contributes meaningfully to the objectives outlined in the ASEAN Digital Masterplan 2025, particularly in advancing digital human capital and supporting sustainable tourism ecosystems. The experience from this initiative affirms that when institutions combine academic rigor with social responsibility, digital transformation becomes more than a technological shift—it becomes a shared journey toward regional resilience and empowerment.

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