

# Integrating Artificial Intelligence to Foster Soft Skills: Innovations for Sustainable Education in Higher Learning Institutions

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**ABSTRACT:** The rapid advancement of Artificial Intelligence (AI) presents transformative opportunities for education, particularly in developing students' competencies for the future workforce. This research investigates the influence of AI integration in education on the enhancement of students' soft skills, with a specific focus on communication skills. Employing a mixed-method approach, the study combines quantitative data from 100 student questionnaires with qualitative insights from focus-group discussions, framed by the Technology Acceptance Model (TAM) and Social Learning Theory (SLT). The findings indicate that students primarily recognize AI's potential in the cognitive and affective domains of learning, appreciating its utility for information access and personalized experiences. However, its impact on behavioral response, particularly the sustained development of communication-related soft skills, remains limited and unclear. While AI stimulates new, efficient study habits, it has not yet demonstrated the capacity to nurture the long-term, interactive practice essential for complex soft skill development. This study concludes that for AI to contribute meaningfully to sustainable education, its design and implementation must evolve beyond efficiency tools to include structured, social, and practice-oriented applications that actively foster critical interpersonal skills.

**KEYWORDS:** Artificial intelligence; soft skills; communication skills; higher education; sustainable education; technology acceptance model

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## 1. Introduction

We live in a modern era where various capabilities could be addressed with different strategies to enhance efficiency for humanity. Particularly noteworthy was the development of innovations aimed at formulating and implementing various innovative strategies [1]. Information technology assisted communities in seeking information [2], demonstrating how the use of technology evolved over time and impacted multiple aspects of societal matters. AI entered a 'participatory turn,' indicating that involving a wider public in the development and deployment of AI systems was beneficial [3]. This approach illustrated how AI could become a powerful participatory force, continuously advancing to new levels of influence. It was anticipated that AI would greatly enhance human skills, augmenting both behavioral and

cognitive capacities. Contrary to negative perceptions, AI efficiently provided essential tools that helped educational institutions enhance students' soft skills. Soft skills, encompassing personal qualities, habits, attitudes, and social graces [4], were crucial for effective learning and overall skill development.

This research aimed to investigate how AI could enhance students' soft skills and explored its potential role in developing new educational strategies in schools and universities. Specifically, the study examined the long-term effects of integrating AI into education on workforce readiness and societal adaptation, which was essential for shaping future educational strategies. It investigated how AI presented new opportunities for changes in study methods and influenced the development of students' soft skills. Additionally, the study explored which AI tools effectively enhanced soft skills, assessed the relationship between AI use and students' skill development, and considered the challenges and opportunities AI presented within the educational context. The findings were expected to demonstrate how technology could drive substantial improvements and transformative changes in the educational sector.

## 2. Literature Review

### 2.1. *Soft skills.*

Improving students' skills in education was an important factor in enhancing their knowledge. It demonstrated how they could achieve changes in behavior and abilities. These skills included interpersonal communication, critical thinking, creativity, and others, collectively referred to as soft skills. Enhancing soft skills provided a practical orientation for students and helped them develop their communication abilities [5]. Essentially, soft skills referred to personalities, attributes, qualities, and personal behavior of individuals [6], and it was equally important for students to appreciate the value of such skills and make deliberate efforts to acquire them [6]. Soft skills were a key aspect of human behavior, encompassing a cluster of personal qualities, habits, attitudes, and social graces [4] aimed at efficient knowledge acquisition, often reinforced through skills training. By improving soft skills, individuals could modify their behavior in social interactions, communication, personality traits, and attitudes [4], as well as develop career-related attributes that prepared them to perform effectively in professional environments. The enhancement and maintenance of soft skills were progressively addressed by educational institutions such as universities. Soft skills significantly influenced students by helping them understand their abilities, shaping their personality and behavior, and adding substantial value to their overall character.

### 2.2. *Artificial Intelligence (AI).*

AI has transformed many aspects of daily life, representing a technological innovation that replaced manual work traditionally performed by humans in various fields [7]. Primarily, AI focused on embedding anthropomorphic intelligence and thinking into machines that could assist humans in diverse ways [7]. AI was initially designed as a personal tool, guided by a base machinery code that enabled complexity and versatility. Over time, AI achieved breakthroughs in applications such as games, chatbots, remote assistants like Alexa and Siri, and cashless retail systems [7]. These applications indirectly produced positive social impacts by improving access to information through enhanced search and language-translation tools, providing better communication services, enabling more efficient transportation, and

supporting personalized healthcare [8]. For instance, in healthcare, AI was designed to improve patient outcomes, reduce costs, and enhance workplace efficiency [9]. AI also emerged prominently in Indonesia, where participants leveraged its capabilities to create new opportunities for the future. Although the use of AI continuously expanded and facilitated numerous processes [10], it also transformed educational practices by introducing new ways to develop capabilities. One example is ChatGPT, a language model that uses advanced AI techniques to generate natural language responses to given prompts [11]. It was regarded as a promising tool for open education, as it could increase the autonomy and self-direction of learners [12].

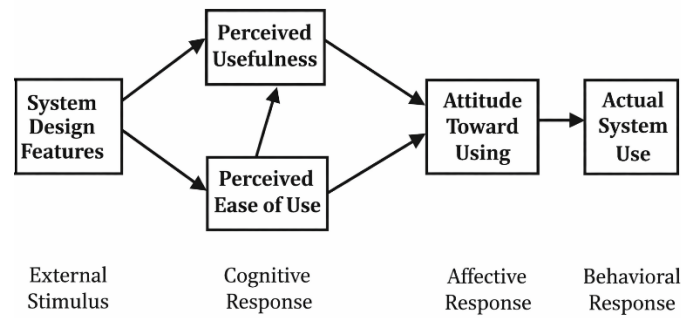
### **3. Research Theory**

#### *3.1. Social learning theory.*

This study explored the integration of AI in education through the lens of Bandura's Social Learning Theory, which emphasizes observational learning, modeling, reinforcement, vicarious reinforcement, and self-efficacy. Bandura stated that humans actively acquired knowledge by observing and imitating others, particularly those who were high-status, knowledgeable, or nurturing [13]. Applying this to AI in education, we examined how students modeled behaviors from influential figures who used AI tools, such as ChatGPT, and how their perceptions and behaviors were shaped by these observations. For instance, students were more likely to emulate the study habits and techniques of respected educators or popular social media influencers who effectively incorporated AI into their learning routines. Social Learning Theory suggested that similarity between human behaviors could impact the development of skills [13]. The modeling process highlighted the significant role of AI in shaping educational practices and student behaviors through observation, utilization, outcomes of effective or ineffective AI use, and attitudes toward AI.

#### *3.2. Technology Acceptance Model (TAM).*

From a practical standpoint, TAM explains not only why a system may be unacceptable to certain users but also how to increase user acceptance through system design [14]. This study aimed to demonstrate how students were influenced by AI as a model in education. TAM considers factors such as perceived usefulness, perceived ease of use, and attitude toward using technology [14]. These factors provided a reliable framework for understanding students' cognitive, affective, and behavioral responses to AI. The theory employs a broad design that emphasizes usefulness and ease of use, as illustrated in Figure 1. Previous studies have applied TAM to examine user behavior toward digital technology. For example, Willy, Nazarudin, and Rulianda [15] demonstrated how the ease of use of technology directly and indirectly influenced its perceived usefulness. Theodosia Yunita [16] highlighted that TAM explained how internet technology utilization shaped individual attitudes and perceptions. Many studies continued to apply this model to investigate human behavior and perceptions regarding the usefulness, ease of use, and acceptance of technology. Applying TAM in this study enabled the investigation of how students harnessed AI as a tool to improve efficiency in education. It underscored the opportunities for educational systems to leverage AI in enhancing students' soft skills and overall learning outcomes.



**Figure 1.** Technology Acceptance Model (TAM original model).

## 4. Methodology

This study utilized a mixed-methods approach, combining both qualitative and quantitative methods. Two theories were employed: Social Learning Theory (SLT) and the Technology Acceptance Model (TAM). The research focused on analyzing university students in Jakarta who used AI as a learning tool. The sample was selected from universities in Jakarta due to the advanced technological infrastructure and the widespread adoption of AI in many educational institutions.

### 4.1. Participants and sampling.

The study involved 100 respondents from universities in Jakarta. While this sample provided valuable insights, it limited the generalizability of the findings. Future studies should expand the sample size to include more participants, thereby improving the robustness and generalizability of the results. Increasing the diversity of the sample beyond the student population of Jakarta would further validate the findings and provide a broader context for understanding AI's role in enhancing soft skills. A purposive sampling method was used to select university students with prior experience using AI tools for academic purposes.

### 4.2. Data collection.

Data were collected over a two-month period. The questionnaire, structured with a five-point Likert scale, was designed to measure students' perceptions of AI's impact on soft skills development. Additionally, focus group discussions, comprising 8–10 participants, provided in-depth qualitative insights, allowing students to share their personal experiences and challenges with AI in a nuanced, conversational setting. These discussions explored students' perceptions, behavioral changes, and the practical implications of AI in their learning environments.

## 5. Results and Discussion

The respondents in this study were active university students in Jakarta, reflecting awareness of AI's effectiveness in developing Soft Skills [4, 12, 13]. Female students responded more actively than male students, with most participants enrolled in S1-level university programs. Students reported using AI technology to enhance their studies, showing significant impact across both genders [2]. Through discussions and interviews with students from various universities, insights were gained regarding the potential of AI in Soft Skills development,

evident from students' feedback on positive and negative impacts, self-efficacy, and overall perception.

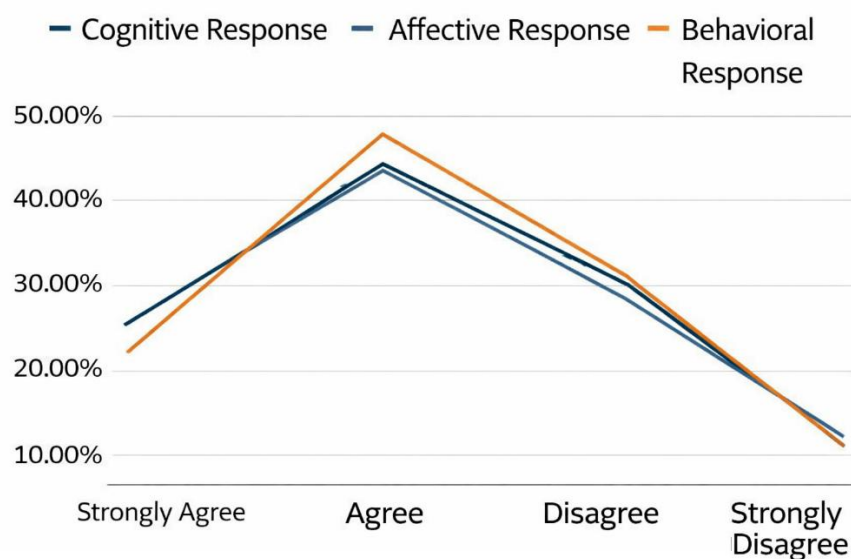
Based on the data presented in Table 1, the average responses for Cognitive, Affective, and Behavioral dimensions were calculated to assess overall acceptance and effectiveness of AI in improving Soft Skills. Behavioral Response showed the highest agreement rate (47.1%), indicating that students found AI highly beneficial in enhancing Soft Skills [7, 9]. Cognitive Response displayed a lower proportion of Strongly Agree (24.5%), suggesting that students perceived AI as playing varied roles in facilitating learning and skill development [6, 11].

**Table 1.** Student perceptions of AI's impact on soft skills development (percentage agreement).

Response Domain	Strongly Agree	Agree	Disagree	Strongly Disagree
Cognitive Response	24.7%	43.4%	25.9%	5.2%
Affective Response	24.5%	44.1%	27.6%	3.9%
Behavioral Response	20.8%	47.1%	28.6%	3.5%

### 5.1. Students' perceptions and behavioral response.

Students recognized AI as a powerful tool for observational learning and educational guidance, as illustrated in Figure 2. Following the release of ChatGPT, many students incorporated it extensively into their study routines, using it to enhance knowledge acquisition, support task completion, and explore diverse problem-solving strategies [9, 10]. They reported that AI provided accurate information, simplified complex learning processes, and encouraged creative approaches to tackling academic challenges [1]. Behavioral responses further indicated that AI tools, particularly ChatGPT, had a notable impact on students' written communication skills, with 47.1% of respondents reporting improvements in structuring their thoughts and expressing ideas more clearly. Automated feedback mechanisms enabled by AI also promoted self-regulation, allowing students to correct responses and refine understanding in real time [8, 14].



**Figure 2.** Students' perceptions of AI's impact on soft skills development.

In contrast, verbal communication skills were less developed, likely due to students' reliance on written interactions with AI. Tools such as Grammarly contributed to improved written communication by offering immediate feedback on grammar, tone, and clarity, whereas speech-recognition software and AI-driven verbal practice chatbots were less frequently used, accounting for the observed gap between verbal and written skill enhancement [7]. Beyond individual learning, students reported that observing peers and others in their environment leveraging AI for educational guidance and productivity reinforced the perception of AI as a multifaceted learning tool. Overall, AI was perceived as enhancing soft skills, facilitating idea generation, and increasing proficiency across both academic and creative tasks [2, 3].

### *5.2. Cognitive and affective perceptions of AI.*

Cognitive responses revealed that students acknowledged AI's role in enhancing learning efficiency but recognized that its practical application sometimes presented challenges [6,15]. Affective responses indicated positive sentiment, with 24.5% of students strongly agreeing that AI use elicited favorable feelings. Some students expressed slight disagreement, reflecting reservations about AI's overall effectiveness in Soft Skills development [4]. Students believed that AI enhanced self-efficacy by providing opportunities to improve study strategies and skill development [5]. While AI was seen as effective in developing general Soft Skills, its impact on specific areas such as verbal communication was more limited [12]. Nevertheless, students acknowledged AI's utility as a strategic tool for personal and academic growth, allowing them to integrate it into daily routines, utilize it as a resource, and gain personalized learning experiences [7, 9]. Despite these benefits, ethical concerns emerged, including data privacy, the digital divide, and potential algorithmic bias [3,8]. Addressing these issues required strict data protection policies, initiatives to improve equitable access to AI, and ongoing evaluation of AI systems to ensure fairness. Focus Group Discussions provided additional insights into students' real-life experiences with AI, highlighting both practical benefits and areas for improvement [1, 14].

## **6. Conclusions**

From the results of this research, it can be concluded that students, in this case college students in Jakarta, were aware of and actively engaged in their education by using AI to assist their studies. They recognized the possibilities and opportunities that AI could provide in a practical and engaging way, particularly in its potential to influence behavior and attitudes. Additionally, AI served as a significant resource in creating more effective and efficient learning environments, allowing students to navigate educational systems with greater ease. Consequently, students' participation highlighted how AI could harness numerous possibilities to deliver even more valuable educational benefits. In this context, students primarily viewed AI as a tool to support their daily academic tasks and enhance soft skills in general. However, from another perspective, the role of AI in education has not yet been fully advanced to systematically develop critical soft skills, such as verbal communication. Investigating AI's role in education also involved understanding its potential for sustainable development in fostering more efficient study methods and enhancing students' soft skills. By providing numerous opportunities and innovations, AI has the capacity to raise awareness and promote more engaging and effective learning experiences. This potential can be strategically harnessed to offer students reliable support in their educational endeavors, thereby facilitating their

personal and academic development. A longitudinal approach, in which students' soft skills development is tracked over multiple semesters or academic years, could provide deeper insights into the long-term impact of AI on their personal and professional readiness. Future research could leverage longitudinal data to assess not only immediate skill acquisition but also how these skills persist, evolve, or translate into broader educational outcomes over time. This study was limited by its relatively small sample size and its focus on a single geographic region, which may restrict the generalizability of the findings. Moreover, the study primarily focused on written communication skills, with less attention given to the development of verbal and interpersonal communication abilities. Future studies should address these limitations by incorporating larger and more diverse samples and exploring AI's impact on a broader spectrum of soft skills, including leadership, teamwork, and verbal communication. Further investigation into AI's long-term effects on students' professional readiness is also warranted.

### Author Contribution

All authors contributed equally to the conception, design, data collection, analysis, and writing of this manuscript. Each author reviewed and approved the final version of the paper.

### Competing Interest

The authors declare no competing interests.

### References

- [1] Rahman, H.; Sri, O.; Yogi, I. (2021). Analysis of Innovation Strategies to Improve the Quality of Infrastructure in Public Organisation using the Technical Evaluation and Decision Square (TEDS) Method. *Jurnal Manajemen Indonesia*, 21, 246–261. <https://doi.org/10.25124/jmi.v21i3.2669>.
- [2] Budiman, H. (2017). Peran Teknologi Informasi Dan Komunikasi Dalam Pendidikan. 8, 1. <https://doi.org/10.24042/atjpi.v8i1.2095>.
- [3] Birhane, A.; Isaac, W.; Prabhakaran, V.; Diaz, M.; Clare, M.; Gabriel, I.; Mohamed, S. (2022). Power to the People? Opportunities and Challenges for Participatory AI. *Communications of the ACM*, 16, 1–8. <https://doi.org/10.1145/3551624.3555290>.
- [4] Vasanthakumari, S. (2019). Soft skills and its application in work place. *World Journal of Advanced Research and Reviews*, 3, 66–72. <https://doi.org/10.30574/wjarr.2019.3.2.0057>.
- [5] Sancho-Cantus, D.; Cubero-Plazas, L.; Botella Navas, M.; Castellano-Rioja, E.; Cañabate Ros, M. (2023). Importance of Soft Skills in Health Sciences Students and Their Repercussion after the COVID-19 Epidemic: Scoping Review. *International Journal of Environmental Research and Public Health*, 20, 4901. <https://doi.org/10.3390/ijerph20064901>.
- [6] Majid, S.; et al. (2012). Importance of soft skills for education and career success. *International Journal for Cross-Disciplinary Subjects in Education*, 2, 1037–1042. <https://doi.org/10.20533/ijcdse.2042.6364.2012.0147>.
- [7] Brandao, P.R. (2025). The Impact of Artificial Intelligence on Modern Society. *AI*, 6(8), 190. <https://doi.org/10.3390/ai6080190>.
- [8] Tomašev, N.; Cornebise, J.; Hutter, F.; et al. (2020). AI for social good: unlocking the opportunity for positive impact. *Nature Communications*, 11, 2468. <https://doi.org/10.1038/s41467-020-15871-z>.
- [9] Jenko, S.; Papadopoulou, E.; Kumar, V.; Overman, S.S.; Krepelkova, K.; Wilson, J.; Dunbar, E.L.; Spice, C.; Exarchos, T. (2025). Artificial Intelligence in Healthcare: How to Develop and Implement Safe, Ethical and Trustworthy AI Systems. *AI*, 6, 116. <https://doi.org/10.3390/ai6060116>.

- [10] Vieriu, A.M.; Petrea, G. (2025). The Impact of Artificial Intelligence (AI) on Students' Academic Development. *Education Sciences*, 15(3), 343. <https://doi.org/10.3390/educsci15030343>.
- [11] Hussein, H.; Gordon, M.; Hodgkinson, C.; Foreman, R.; Wagad, S. (2025). ChatGPT's Impact Across Sectors: A Systematic Review of Key Themes and Challenges. *Big Data and Cognitive Computing*, 9(3), 56. <https://doi.org/10.3390/bdccc9030056>.
- [12] Glaveanu, S.M.; Maier, R. (2025). An Analysis of Students' Attitudes Toward Artificial Intelligence—ChatGPT, in Particular—In Relation to Personality Traits, Coping Strategies, and Personal Values. *Behavioral Sciences*, 15(9), 1179. <https://doi.org/10.3390/bs15091179>.
- [13] Bandura, A.; Walters, R.H. (1977). *Social Learning Theory*, Vol. 1. Prentice Hall: Englewood Cliffs, NJ, USA.
- [14] Song, Y.; Qiu, X.; Liu, J. (2025). The Impact of Artificial Intelligence Adoption on Organizational Decision-Making: An Empirical Study Based on the Technology Acceptance Model in Business Management. *Systems*, 13(8), 683. <https://doi.org/10.3390/systems13080683>.
- [15] Harsanto, W.A.; Nazaruddin, M.; Rulianda, P.W. (2023). The Use of Technology Acceptance Model (TAM) to Analyze Consumer Acceptance Towards E-Commerce Websites: A Case of the Plantage.id Digital Transformation Solution. *Journal of Environmental and Development Studies*, 4, 28–37. <https://doi.org/10.32734/jeds.v4i2.13144>.
- [16] Durman, T.Y.; Musdholifah, M. (2020). Integrasi Technology Acceptance Model dan Theory of Planned Behavior terhadap Intention to Use Mobile Payment (Studi pada Pengguna Ovo di Surabaya). *Jurnal Ilmu Manaj*, 8, 33–681. <https://ejournal.unesa.ac.id/index.php/jim/article/view/33681>.
- [17] Leva, B.; Onič, T.; Todorović, T.; Urh, J.; Hazemali, D. (2025). Student Perceptions of Digital Tools in Language and Translation Programs: A Survey-Based Case Study at the University of Maribor, Slovenia. *Education Sciences*, 15(9), 1119. <https://doi.org/10.3390/educsci15091119>.



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