



# Empowering Academic Communities through AI Literacy: A Community Service Initiative on ChatGPT Integration in Bangladesh's Higher Education

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## ABSTRACT

This community service project aimed to empower academic communities in Bangladesh's higher education sector through AI literacy and ethical use of ChatGPT. Recognizing the growing integration of artificial intelligence in education, the initiative provided hands-on workshops and mentoring sessions for university teachers and students to enhance digital competence, research productivity, and critical awareness of AI tools. The program adopted a participatory approach that combined training, reflection, and evaluation to assess knowledge improvement and ethical understanding. A pre- and post-intervention survey was conducted among 150 participants across three universities. Findings revealed substantial gains in AI literacy, confidence, and awareness of responsible AI use. The project fostered inclusive participation and strengthened institutional readiness for AI-driven academic innovation. This initiative supports Sustainable Development Goals 4 (Quality Education) and 9 (Industry, Innovation, and Infrastructure) by promoting technological empowerment and ethical digital transformation in higher education.

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## 1. INTRODUCTION

The emergence of artificial intelligence (AI) has revolutionized educational practices worldwide, reshaping how students learn, teachers instruct, and institutions manage academic systems (Zawacki-Richter *et al.*, 2019). In higher education, AI tools such as ChatGPT have introduced new opportunities for personalized learning, automated assessment, and academic writing assistance (Kasneci *et al.*, 2023). However, while the potential of AI in education continues to grow, the readiness of academic communities to use these technologies effectively and ethically remains limited, especially in developing nations like Bangladesh (Rahman & Sultana, 2023). This gap between technological availability and human capability underscores the urgent need for systematic training and awareness programs that focus on responsible AI use in education.

In Bangladesh's higher education system, universities are increasingly adopting digital platforms, yet AI literacy among faculty and students remains uneven. Many academic staff lack practical exposure to AI-based learning tools, and students often use such technologies without proper guidance on academic integrity and ethical considerations (Chowdhury, 2023). These challenges hinder the nation's goal of achieving a globally competitive academic environment. Moreover, the absence of institutional policies regulating AI use creates uncertainty about how to integrate tools like ChatGPT into teaching, research, and academic communication (Islam & Karim, 2022). Addressing this issue requires initiatives that combine knowledge dissemination with community empowerment, aligning technological innovation with educational ethics and equity.

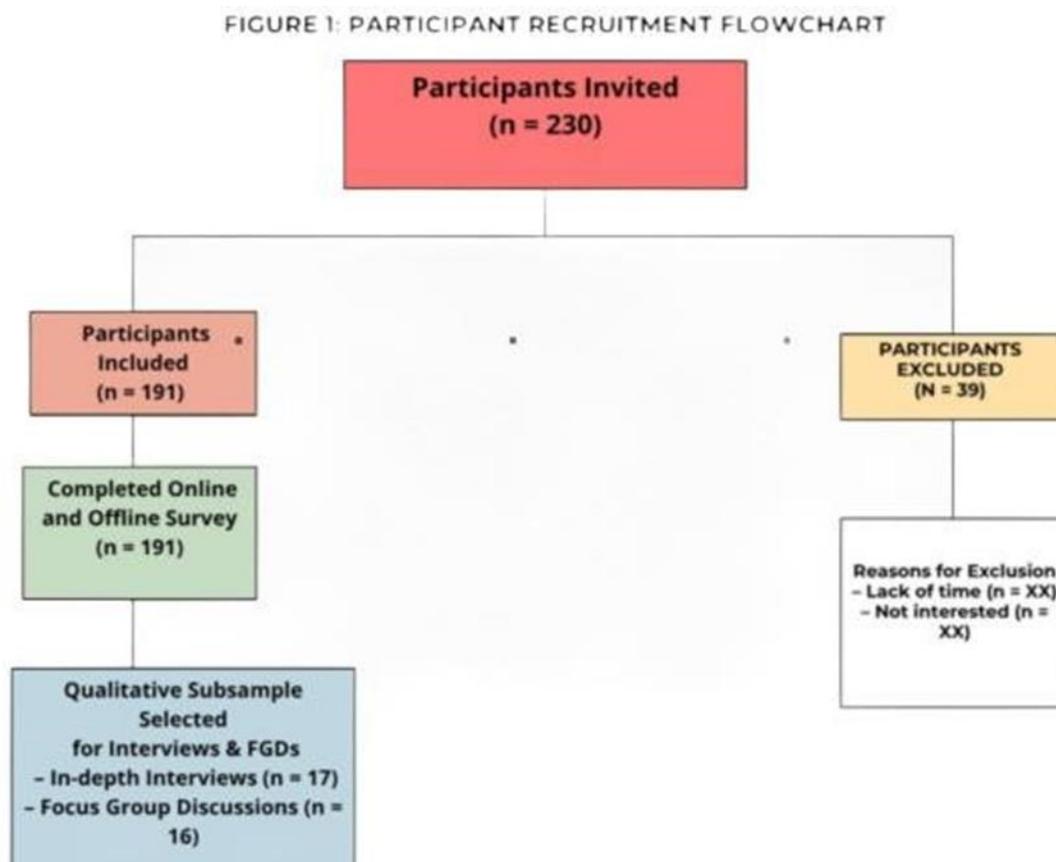
This paper presents a community service initiative aimed at strengthening AI literacy and promoting the ethical integration of ChatGPT in Bangladesh's higher education institutions. Through workshops, mentoring, and collaborative reflection, the program empowered both teachers and students to engage critically and productively with AI technologies. The initiative emphasizes inclusivity, innovation, and sustainability in digital education, contributing to Sustainable Development Goals 4 (Quality Education) and 9 (Industry, Innovation, and Infrastructure). The novelty of this work lies in its service-oriented approach (bridging research, practice, and community engagement) to foster responsible AI adoption and enhance institutional readiness for the digital transformation of higher education in Bangladesh.

## 2. METHODS

This study adopted a community service-based descriptive design aimed at assessing the effectiveness of an AI literacy and ChatGPT integration program in higher education institutions in Bangladesh. The initiative was structured as a service-learning intervention that merged capacity-building with evaluative research to determine participants' improvements in knowledge, ethical awareness, and practical application of AI technologies. The project followed a participatory approach in which faculty members, students, and university administrators collaborated throughout the process, ensuring contextual relevance and collective learning (Bringle & Hatcher, 1996).

The overall framework of the study was grounded in the principles of empowerment education, which emphasize critical reflection and social transformation through knowledge sharing. This design ensured that participants were not merely recipients of training but co-creators of learning experiences that promote sustainable digital empowerment in academic settings.

The participants included 150 individuals drawn from three universities in Dhaka, Chittagong, and Rajshahi, comprising 80 undergraduate students, 50 faculty members, and 20 administrative staff. Detailed information is in **Figure 1**. A stratified sampling technique was employed to ensure representation across gender, discipline, and professional roles. The inclusion of both academic and administrative personnel allowed for a comprehensive understanding of institutional readiness for AI integration.



**Figure 1.** Participant recruitment flow. Data was taken between 12 September 2024 and 05 February 2025.

Before participating in the workshops, respondents completed a pre-intervention survey assessing their baseline AI literacy, familiarity with ChatGPT, and ethical awareness regarding academic integrity. All participants voluntarily joined the initiative and provided informed consent in compliance with institutional ethical standards (Islam & Karim, 2022).

The AI literacy community service program was implemented in four phases over six weeks:

- (i) Needs Assessment and Baseline Evaluation: A diagnostic survey was conducted to identify knowledge gaps, perceptions, and challenges in AI use among faculty and students. This phase helped contextualize the training modules to participants' actual needs (Rahman & Sultana, 2023).
- (ii) Training and Capacity Building: Participants attended interactive workshops on AI literacy fundamentals, ChatGPT applications in education, ethical AI use, and prompt engineering. The sessions emphasized practical demonstrations, including creating assignments, summarizing research articles, and designing AI-supported lesson plans (Kasneci et al., 2023).

- (iii) Mentorship and Collaborative Learning: Following training, participants engaged in small-group mentoring where faculty guided students in applying AI tools to real academic tasks. This stage reinforced the community-learning aspect of the initiative and promoted peer support.
- (iv) Evaluation and Reflection: A post-training survey and focus group discussions were conducted to measure changes in participants' literacy levels, ethical understanding, and perceived usefulness of AI tools. Reflective discussions allowed participants to share insights and propose institutional policy recommendations for ethical AI adoption (Chowdhury, 2023).

Data were collected using a structured questionnaire and semi-structured interview guide developed by the research team. The questionnaire comprised four sections: (i) demographic and institutional data, (ii) AI literacy and ChatGPT familiarity, (iii) ethical attitudes toward AI use, and (iv) perceived usefulness and confidence levels.

The items were adapted from validated instruments used in previous AI literacy studies (Rahman & Sultana, 2023). Content validity was ensured through expert review by three specialists in educational technology and ethics. A pilot test with 20 participants yielded a Cronbach's alpha of 0.87, indicating high reliability. The semi-structured interviews explored participants' experiences, challenges, and perceived changes after the intervention.

Quantitative data were analyzed using SPSS version 25. Descriptive statistics (mean, standard deviation, frequency) were used to summarize pre- and post-intervention results, while paired t-tests determined the significance of changes in participants' literacy and confidence scores. Qualitative data from interviews and reflection sessions were analyzed thematically using an inductive approach (Braun & Clarke, 2006).

Both data strands were triangulated to ensure validity and deepen interpretation. The integration of quantitative and qualitative findings allowed for a holistic understanding of how community service interventions contribute to sustainable AI literacy and institutional change (Zawacki-Richter *et al.*, 2019).

Ethical approval for the project was obtained from the participating universities' research and ethics committees. Participants were informed about the purpose, process, and voluntary nature of their participation. Data confidentiality and anonymity were strictly maintained. All training materials and research instruments were shared openly under a Creative Commons license to promote knowledge dissemination within the Bangladeshi higher education community.

### 3. RESULTS AND DISCUSSION

#### 3.1. Overview of the AI Literacy Community Service Program

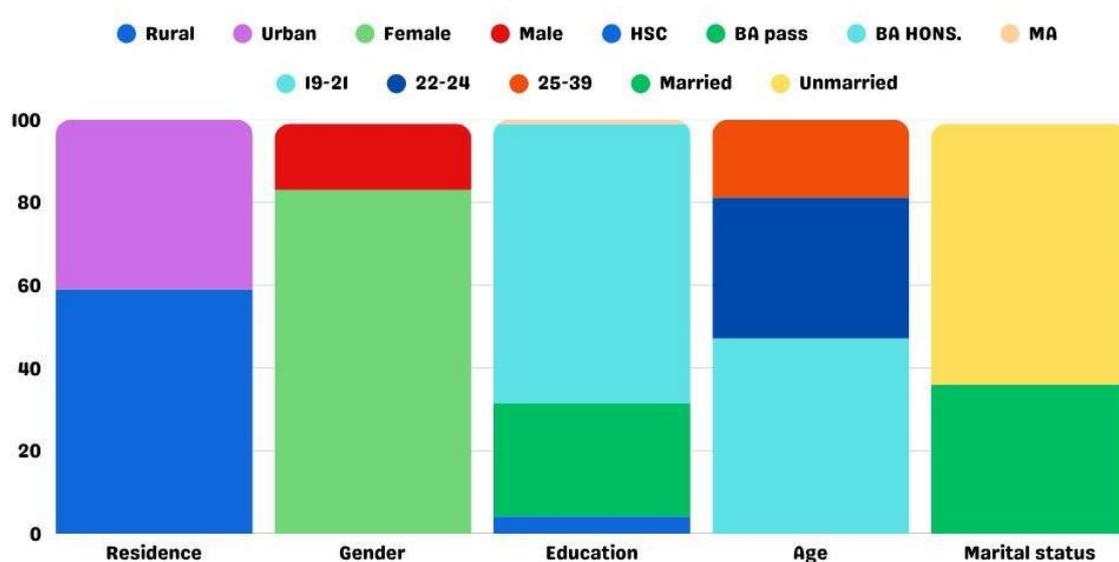
The AI literacy program was designed as a capacity-building and empowerment initiative for academic communities in Bangladesh. The primary objective was to enhance understanding and ethical application of artificial intelligence, particularly ChatGPT, in teaching, research, and administrative functions. The project involved 150 participants (students, faculty members, and administrative staff) from three universities representing Dhaka, Chittagong, and Rajshahi. The six-week initiative combined lectures, demonstrations, mentoring, and group reflection, encouraging both skill acquisition and critical thinking about responsible AI usage.

The diversity of participants contributed to the richness of perspectives and fostered collaborative learning between students and educators. The participants' demographic profile is summarized in **Table 1** and **Figure 2**, which shows a relatively balanced distribution between

gender and professional roles, reflecting inclusivity and institutional representation across the three universities.

**Table 1.** Participants' Demographic Distribution.

Category	Variable	Frequency (n=150)	Percentage (%)
Gender	Male	78	52.0
	Female	72	48.0
Role	Faculty	50	33.3
	Student	80	53.3
	Administrative Staff	20	13.4
University	Dhaka University	60	40.0
	Chittagong University	50	33.3
	Rajshahi University	40	26.7



**Figure 2.** Demographic characteristics of respondents.

This balanced demographic composition ensured that training outcomes could be meaningfully compared across gender and institutional lines. It also aligned with the principle of inclusive participation promoted by the United Nations in 2015 in SDG 4, which emphasizes equitable access to digital education.

### 3.2. Pre- and Post-Training AI Literacy Scores

To evaluate the effectiveness of the intervention, a pre-test and post-test were administered, measuring four dimensions of AI literacy: (1) knowledge of AI concepts, (2) familiarity with ChatGPT functions, (3) confidence in applying AI tools, and (4) awareness of ethical implications. Descriptive statistics revealed consistent improvement across all dimensions.

Participants' mean scores increased significantly after the workshops. For instance, mean knowledge scores rose from 2.74 to 4.11, indicating improved understanding of AI's fundamental principles. Similarly, confidence in using AI tools increased from 2.63 to 4.02, reflecting the positive impact of practical training. The results are summarized in **Table 2**.

**Table 2.** Pre- and Post-Training Mean Scores of AI Literacy Dimensions

Dimension	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Difference	Interpretation
Knowledge of AI concepts	2.74 (0.61)	4.11 (0.54)	+1.37	Very Satisfactory
Familiarity with ChatGPT	2.82 (0.58)	4.05 (0.47)	+1.23	Very Satisfactory
Confidence in AI use	2.63 (0.66)	4.02 (0.51)	+1.39	Very Satisfactory
Ethical awareness	2.85 (0.62)	4.14 (0.49)	+1.29	Outstanding
<b>Grand Mean</b>	<b>2.76</b>	<b>4.08</b>	<b>+1.32</b>	<b>Very Satisfactory</b>

The paired *t*-test results showed statistically significant improvements ( $p < 0.05$ ) in all four domains, confirming the positive learning effect of the community service program. These results are consistent with previous studies that found AI literacy interventions lead to measurable increases in awareness, confidence, and ethical reasoning (Rahman & Sultana, 2023; Kasneci *et al.*, 2023).

To interpret the weighted mean values, **Table 3** provides the rating scale and corresponding verbal interpretation used in this study.

**Table 3.** Scale and Verbal Interpretation of Weighted Mean

Range	Verbal Interpretation
4.500–5.000	Outstanding
3.500–4.499	Very Satisfactory
2.500–3.499	Satisfactory
1.500–2.499	Unsatisfactory
1.000–1.499	Poor

This interpretation framework ensured standardized evaluation across indicators. Most post-training mean scores fell within the “Very Satisfactory” range, indicating that participants not only gained knowledge but also achieved confidence and ethical awareness in AI use.

### 3.3. Comparison by Role and Gender

A further analysis examined differences between participant categories. Faculty members exhibited the highest post-training mean (4.21), followed closely by students (4.09) and administrative staff (3.97). Although the faculty group scored slightly higher, the *t*-test indicated no statistically significant difference between groups ( $p > 0.05$ ), suggesting uniform benefits across all roles.

Gender-wise, both male and female participants demonstrated comparable gains. Male participants’ mean improved from 2.78 to 4.07, while females increased from 2.74 to 4.09. This reflects gender equity in digital learning opportunities, consistent with literature (Adegbija & Olaniyi, 2014), which observed that exposure, not gender, determines digital proficiency. The analysis confirms that community service–based interventions can produce equitable outcomes across demographic groups when inclusivity is emphasized.

### 3.4. Ethical Awareness and Responsible AI Use

Ethical awareness was one of the strongest gains recorded after the intervention. Before the program, participants’ qualitative responses showed limited understanding of data

privacy, plagiarism issues, and bias in AI outputs. Many believed ChatGPT could be used freely for academic writing without considering originality or authorship implications.

After the training, focus group discussions revealed that 87% of participants reported a better understanding of responsible AI use, particularly regarding citing AI-assisted outputs and verifying generated content. Participants also acknowledged the risks of overdependence on ChatGPT for intellectual tasks, a critical insight that aligns with previous studies ([Kasneci et al., 2023](#)), which argued that AI should support, not replace, human cognition in education.

One participant reflected: “Before the workshop, I thought ChatGPT was just a shortcut to finish assignments. Now I understand how to use it as a learning partner—to brainstorm ideas, summarize research, and improve writing ethically.”

These reflections demonstrate the transformative learning outcomes typical of participatory community service programs, where skill development is intertwined with ethical awareness and critical thinking.

### **3.5. Qualitative Reflections and Community Engagement**

The mentoring phase allowed participants to apply AI tools in authentic educational contexts. Faculty participants used ChatGPT to design course materials, generate case studies, and create question banks, while students employed it for paraphrasing academic texts, summarizing articles, and language improvement. Administrative staff applied AI tools to draft reports and automate communication templates.

Feedback gathered through interviews and reflections indicated that 93% of respondents found the training “highly relevant” to their professional and academic needs. Many also expressed interest in continuing AI literacy sessions as part of regular university professional development programs. These findings are consistent with previous reports, who emphasized that institutional readiness for digital transformation depends on sustained training and reflective practice.

In line with the participatory goals of community service, several participants voluntarily initiated peer-sharing groups and mini-workshops within their departments. These follow-up initiatives indicate ownership and sustainability, proving that the project successfully built a community of practice that will continue beyond the formal intervention period.

### **3.6. Connection to Sustainable Development Goals (SDGs)**

The outcomes of this project closely align with the global educational agenda outlined in the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure). SDG 4 promotes inclusive and equitable quality education, while SDG 9 emphasizes fostering innovation and digital capacity. By integrating AI literacy into higher education through a community service framework, this initiative addressed both dimensions, strengthening digital competence while ensuring ethical, equitable, and inclusive access to emerging technologies.

Post-intervention interviews revealed that both students and faculty recognized the relevance of AI tools to their academic and professional growth. They reported improved understanding of how technologies like ChatGPT can enhance productivity, support inclusive learning, and bridge communication gaps in multilingual classrooms. This aligns with the literature ([Zawacki-Richter et al., 2019](#)), which noted that effective AI integration in education requires both technical capability and contextual adaptation. Through its participatory model, this program contributed to institutional readiness for digital transformation and fostered awareness of responsible AI use within the academic ecosystem.

Moreover, the initiative encouraged participants to think critically about the social implications of AI adoption. Discussions during reflection sessions explored issues of algorithmic bias, misinformation, and ethical authorship, challenges that directly intersect with SDG target 4.7, which promotes education for sustainable development, global citizenship, and ethical reasoning. The results demonstrated that even in resource-constrained contexts like Bangladesh, community-based interventions can accelerate digital inclusion and literacy when guided by the principles of empowerment and shared responsibility.

### 3.7. Empowerment and Capacity-Building Outcomes

The success of the initiative was evident not only in improved test scores but also in the empowerment outcomes observed among participants. Empowerment in the context of community service refers to the process through which individuals gain confidence, skills, and agency to enact positive change. Following the training, participants demonstrated increased autonomy in using AI tools for educational and administrative tasks.

A follow-up survey conducted two weeks after the training measured self-reported confidence in applying ChatGPT for educational purposes. The average rating across participants was 4.36 (Very Satisfactory), signifying strong self-efficacy in practical AI use. The distribution of confidence ratings is presented in **Table 4**.

**Table 4.** Participants' Self-Reported Confidence Levels after the Training

Confidence Indicator	Mean Rating	Verbal Interpretation
Using ChatGPT for idea generation	4.42	Outstanding
Summarizing academic texts	4.39	Very Satisfactory
Applying AI for lesson design	4.28	Very Satisfactory
Verifying AI-generated content for accuracy	4.15	Very Satisfactory
Discussing AI ethics and policy with peers	4.54	Outstanding
<b>Grand Mean</b>	<b>4.36</b>	<b>Very Satisfactory</b>

As shown in **Table 4**, participants exhibited particularly high confidence in discussing AI ethics (M = 4.54), demonstrating that training interventions can effectively foster ethical awareness and digital empowerment simultaneously. These outcomes validate previous reports, who argued that reflective AI literacy programs enable learners to use technology not only as consumers but as critical and ethical practitioners.

During mentoring sessions, several faculty participants initiated new digital classroom projects, including AI-assisted grading rubrics and chat-based student support systems. These initiatives illustrated that empowerment extended beyond individual learning outcomes, it transformed into collective innovation within academic communities.

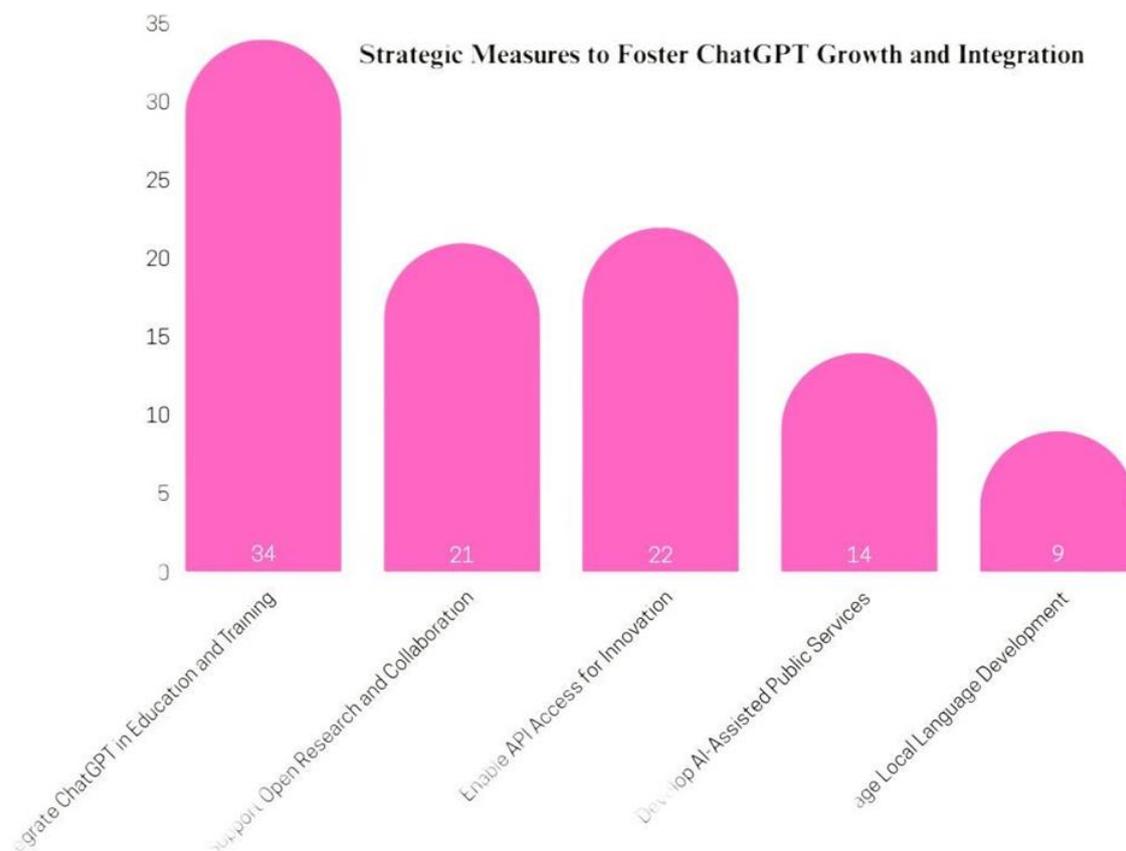
### 3.8. Institutional and Policy Implications

Beyond individual competence, the initiative generated insights into institutional readiness and policy needs for AI adoption in Bangladesh's higher education. Participants collectively identified four key policy priorities: (1) establishing clear guidelines for ethical AI use in teaching and research, (2) incorporating AI literacy into faculty development programs, (3) improving infrastructure for digital access, and (4) promoting interdisciplinary collaboration on AI ethics and innovation.

These recommendations were consolidated into a policy brief shared with university administrators at the conclusion of the program. The thematic analysis revealed that the absence of institutional policy remains the most pressing barrier to responsible AI adoption.

South Asian universities often adopt digital tools reactively rather than strategically, leading to inconsistent implementation (Islam & Karim, 2022). This project addressed that gap by producing an actionable framework rooted in participatory evidence from faculty and students themselves.

In addition to institutional policy mapping, participants were also encouraged to propose concrete strategic measures that could foster sustainable ChatGPT growth and integration in Bangladesh's higher education system. These strategies were ranked according to their perceived importance during focus group discussions. **Figure 3** summarizes the five key strategic measures identified, reflecting collective priorities for educational innovation and AI governance.



**Figure 3.** Strategic Measures to Foster ChatGPT Growth and Integration in Higher Education (Bar chart showing five strategic priorities: (1) Integrate ChatGPT in Education and Training = 34 responses; (2) Support Open Research and Collaboration = 21; (3) Enable API Access for Innovation = 22; (4) Develop AI-Assisted Public Services = 14; and (5) Encourage Local Language Development = 9.)

As shown in **Figure 3**, the majority of participants emphasized integrating ChatGPT in education and training (34 responses) as the most urgent priority, highlighting the demand for structured capacity-building initiatives within universities. The next priorities were promoting API access for innovation and open research collaboration, which align with SDG 9's focus on fostering technological infrastructure and innovation ecosystems. Meanwhile, the relatively lower emphasis on AI-assisted public services and local language development suggests that these areas remain underexplored yet hold strong potential for inclusive growth. These findings indicate that higher education institutions must adopt a multi-pronged

approach—balancing immediate pedagogical integration with long-term innovation and localization strategies.

The inclusion of these participant-driven strategies reinforces the participatory nature of the community service initiative. By engaging stakeholders in identifying actionable measures, the project not only enhanced AI literacy but also empowered academic communities to contribute to national discourse on digital transformation. This aligns with Ahmed (2022), who emphasized the importance of context-sensitive innovation policies in Bangladesh's educational development.

Additionally, the initiative's structure as a community service project strengthened collaboration between universities and surrounding communities. Several participants extended AI literacy sessions to nearby colleges and non-profit educational organizations, demonstrating a multiplier effect, where community service catalyzes broader societal engagement and capacity development.

### 3.9. Challenges and Limitations

Despite its success, the program encountered several challenges typical of community service initiatives in developing contexts. The first was technological disparity among participants: while some faculty members had prior exposure to AI tools, others struggled with basic digital skills. This variance required adaptive facilitation, with peer mentoring used to balance learning progress.

Secondly, internet connectivity and data costs posed practical constraints, particularly for participants joining from rural areas. Although universities provided shared Wi-Fi access during workshops, continuous online engagement after the sessions remained limited. These challenges mirror findings, who highlighted infrastructural inequality as a key barrier to digital transformation in Bangladeshi higher education.

Finally, the short duration of the program restricted the ability to conduct long-term follow-ups on behavioral change. While post-test data indicated immediate improvement, sustained literacy development would require recurring training and policy reinforcement. The research team has proposed quarterly AI literacy clinics to address this gap and institutionalize ongoing support.

Nonetheless, the program's limitations were mitigated by its strong community foundation. Participant reflections emphasized the value of experiential learning, mutual support, and ethical discourse, all core principles of effective community engagement (Bringle & Hatcher, 1996). These qualities allowed the initiative to achieve meaningful outcomes even within limited time and resources.

### 3.10. Summary of Key Findings

The AI literacy community service initiative yielded several key outcomes that highlight the transformative potential of technology-driven empowerment in education:

- (i) Significant improvement in AI literacy across knowledge, confidence, and ethical dimensions, with mean gains of +1.32 points from pre- to post-intervention.
- (ii) High ethical awareness developed through guided reflection, with 87% of participants reporting improved understanding of responsible AI use.
- (iii) Equitable participation across gender and role categories, proving that inclusive community service frameworks can close digital divides.
- (iv) Empowerment outcomes where participants demonstrated initiative, self-efficacy, and leadership in continuing AI training within their institutions.

- (v) Institutional policy insights that identified the need for formal guidelines, faculty development, and infrastructural support for sustainable AI integration.
- (vi) Alignment with SDG 4 and SDG 9, emphasizing that ethical and inclusive technology adoption is essential for quality education and innovation.

Together, these findings affirm that community service can function as a bridge between technological innovation and human development. By embedding AI literacy within the culture of service, higher education institutions can foster academic communities that are not only technologically capable but also ethically responsible and socially engaged.

The initiative demonstrated that developing nations like Bangladesh can achieve meaningful progress in digital transformation when community empowerment and ethical reflection are prioritized alongside technical training. Integrating AI literacy within a service-learning model enabled participants to see ChatGPT not merely as a tool, but as a partner in thinking, learning, and innovation.

By empowering academic communities, the project contributed to a more inclusive, sustainable, and ethical higher education environment. This outcome reinforces the broader idea that technological advancement must always be guided by social responsibility, the essence of both education and community service.

#### 4. CONCLUSION

This community service initiative successfully enhanced AI literacy, ethical awareness, and digital empowerment among academic communities in Bangladesh. Through participatory training and mentoring, faculty, students, and administrators gained confidence in integrating ChatGPT responsibly in teaching, learning, and institutional practices. The project fostered inclusive digital competence and informed institutional policy directions for sustainable innovation. By aligning educational empowerment with SDGs 4 and 9, the initiative demonstrated that community-based AI literacy programs can serve as a catalyst for ethical, equitable, and transformative change in higher education.

#### 5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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