Examining AI Literacy in Korean Higher Education

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대학교육에서의 인공지능 리터러시 탐색 연구

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Abstract

This paper synthesizes empirical findings from three studies conducted at Korean universities, targeting pre-service English teachers, undergraduates across multiple disciplines, and EFL learners, to examine the current state of AI literacy in higher education. Across all three investigations, prior exposure to AI education, however brief, was consistently associated with greater interest, higher confidence, and stronger competencies, suggesting that early instructional contact initiates a self-reinforcing cycle of engagement. Pronounced disciplinary disparities emerged, with STEM students outperforming humanities and social sciences peers on knowledge and application measures, while coding knowledge deficiency was the most widely perceived barrier, despite its limited relevance to actual AI tool use. EFL learners exhibited a striking gap between high adoption rates and low self-reported familiarity, coupled with pragmatic concerns about data privacy and the erosion of critical thinking. These converging patterns point to the need for differentiated, discipline-specific AI curricula grounded in hands-on practice, strengthened digital literacy prerequisites, and institutional policies that distinguish legitimate AI-assisted learning from academic misconduct.

1. Introduction

The proliferation of generative AI applications across academic settings has raised pressing questions about what university students actually understand about these technologies. While adoption rates continue to climb, the gap between tool usage and informed engagement remains largely unaddressed in curricular practice. This paper synthesizes empirical findings from three studies conducted at Korean universities, each targeting a distinct student population: pre-service English teachers, undergraduates spanning multiple disciplines, and English as a foreign language (EFL) learners. Taken together, these investigations illuminate the multifaceted nature of AI literacy and its implications for higher education policy and pedagogy[4].

Scholars working in this area have converged on a tripartite conceptualization of AI literacy that moves well beyond operational proficiency. The construct encompasses a technical dimension, grasping how machine learning processes function and why AI outputs depend on training data, alongside a critical dimension that foregrounds the capacity to interrogate AI-generated content for accuracy, bias, and contextual appropriateness. Also, the ethical dimension addresses concerns around data privacy, algorithmic fairness, and the responsibilities that accompany AI use in academic and professional life [5]. Before late 2022, student interaction with AI remained largely indirect, mediated through adaptive learning systems and automated grading platforms that demanded little active comprehension. The arrival of conversational AI interfaces fundamentally altered that dynamic, thrusting students into direct, sustained engagement with systems whose workings they seldom grasp at any meaningful

level [6].

2. Literature Review

The first study [1] surveyed pre-service teachers enrolled in English education programs. A majority of respondents reported no formal AI training. Yet those who had received even modest exposure, through university electives, special lectures, or extracurricular workshops, exhibited markedly higher interest in AI-enhanced pedagogy, stronger motivation to acquire technical skills, and greater demand for specialized AI courses in English education. These differences were statistically significant, suggesting that initial exposure triggers a self-reinforcing cycle: familiarity breeds curiosity, which in turn drives further learning. Barrier analysis revealed that perceived deficiency in coding knowledge constituted the most prominent obstacle, followed by limited mathematical background and insufficient computing skills. Pre-service teachers without prior AI experience reported particularly acute difficulty with basic computing operations, a finding that underscores the scaffolded nature of digital competencies; AI literacy, it appears, presupposes a solid foundation in general digital literacy.

The second investigation [2] assessed AI literacy across academic majors at a national university. Students in STEM-oriented fields consistently outperformed their peers in humanities and social sciences on measures of AI knowledge, learning interest, and self-reported application ability. An overwhelming proportion of participants, regardless of current literacy levels, expressed a willingness to pursue further AI education, indicating strong intrinsic motivation that institutions could harness through well-designed programming. As in the first study, coding knowledge deficiency ranked highest among perceived barriers, followed by shortfalls in mathematical and computing skills. Hardware accessibility ranked lowest, indicating that the obstacles students face are cognitive and pedagogical rather than infrastructural. These patterns carry a clear practical message: a one-size-fits-all approach to AI education will inevitably leave some students behind. STEM majors may find generic introductory courses unstimulating, while humanities students may feel overwhelmed by content that assumes technical prerequisites they lack.

The third study [3] documented the adoption patterns of AI tools among university-level EFL students. The vast majority reported using at least one AI application for language learning, with ChatGPT dominating the tool landscape, followed by Google Translate, Grammarly, and Microsoft Bing. Academic necessity drove adoption among nearly half of respondents; convenience considerations accounted for the remainder. Yet a striking paradox emerged: despite high usage rates, most participants characterized their familiarity with AI as below moderate, and a majority had received no formal training. Students rated AI effectiveness for English improvement as cautiously positive. Five principal concerns emerged—data privacy ranked highest, followed by erosion of critical thinking, unreliable outputs, limited technical knowledge, and operational difficulties. At the same time, participants valued immediate feedback, enhanced comprehension through translation, and efficient access to learning materials. This dual awareness—appreciation of benefits alongside recognition of risks—suggests a pragmatic rather than naive orientation toward AI.

3. Discussion

Several threads run consistently across all three investigations. The relationship between prior experience and subsequent engagement is perhaps the most consequential. In each study, students who had encountered AI education demonstrated greater interest, higher confidence, and stronger competencies than their unexposed counterparts. The implication for program design is straightforward: early, accessible entry points into AI instruction can catalyze virtuous cycles of learning that compound over time. Conversely, students denied such exposure risk, falling into an avoidance pattern in which unfamiliarity breeds discomfort, which in turn discourages participation [7].

The persistent prominence of coding knowledge as a perceived barrier warrants careful interpretation.

Students across all three populations identified programming deficiency as their primary obstacle, yet effective use of contemporary AI tools does not, strictly speaking, require coding ability. The barrier may be as perceptual as the substantive association between artificial intelligence and computer programming, which inflates the perceived prerequisites for engagement. Addressing this misperception through targeted curricular messaging may prove as important as providing technical instruction itself [8].

4. Conclusion

The findings converge on four recommendations. First, institutions should develop discipline-specific AI courses rather than generic offerings: teacher education programs might integrate AI English pedagogy. In contrast, general education tracks could offer introductory modules calibrated to the starting points of humanities and social science students. Second, practice-oriented pedagogies, project-based learning with AI tools, hands-on workshops, experimentation-driven assessment, should take precedence over lecture-based instruction, given the demonstrated link between experiential exposure and sustained engagement [9]. Third, foundational digital literacy must be strengthened as a prerequisite; students who struggle with basic computing operations face compounded difficulties when confronting AI-specific tasks (Mansoor et al., 2024). Fourth, institutional policies must evolve to provide clear guidelines on appropriate AI use in academic work, distinguishing legitimate learning support from academic misconduct, and to invest in faculty development so that instructors can model and guide responsible AI engagement [10].

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