Diversifying Understandings of AI Literacy: A Global South Perspective from Vietnam Education

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Abstract. The rapid rise of Generative Artificial Intelligence (AI) is increasingly influencing the education sector globally. Understanding and supporting AI literacy among educators is therefore a growing priority to ensure confidence and competence in responsible use. This study presents the initial findings from a survey of high school teachers' current AI literacy in Vietnam. We conducted and analysed a survey (n = 543, rural and urban) to cover AI awareness, attitudes, ethics, and methods of use. Many teachers expressed enthusiasm and perceived value in the use of AI in education, but there are still gaps in ethics, infrastructure, and training. We argue that AI literacy initiatives must go beyond technical competence and include ethics, transparency, and sociocultural relevance, supporting a meaningful integration of AI in Vietnamese schools and contributing to broader discussions in the Global South.

Keywords: AI Literacy, AI in Education, Digital Transformation, Generative Artificial Intelligence

1 Introduction

Since the initial release of ChatGPT in 2022, educators and education institutions around the world have been grappling with the fast-paced development of Generative AI and its impact and implications in and on education. Developing the literacy of AI for users (learners and teachers) is a core strand of ongoing

research and development work in education and computer science. The latest reviews of the international systematic literature on AI and AI literacy in K-12 education (e.g. [1] and [2]) have revealed the important role AI literacy plays in education development. They also revealed the complexity of how domains of AI literacy (e.g., everyday, professional, and critical AI literacy) interact and how AI literacy is interwoven with other literacies (e.g., digital literacy) at micro (personal), meso (institutional and professional) and macro (national and international) levels. This paper contributes to the growing body of empirical research on teacher AI literacy. It focuses on a Global South perspective on the development of AI literacies, working with high school teachers in Vietnam as a user case study, to offer emerging findings and reflections on the responsible development of AI literacy in education in the global AI ecosystem. It reports emerging findings from a mixed-methods survey conducted in May 2025 across eight high schools in the North, Central, and South regions of Vietnam. The survey was co-developed by researchers in education and computer science in the UK and Vietnam, based on the Long and Magerko AI Literacy Framework [3] and the Delcker et al. AI competence domains for teachers [4]. This study addresses the AI literacy of current high school teachers in Vietnam (RQ1), the differences in AI literacy by social and professional demographic groups (RQ2), and the current implications at the micro, meso and macro levels (RQ3). This paper reports emerging findings that mainly address RQ1 and RQ2 with the intention of discussing RQ3 with the conference delegates.

2 Background and Literature Review

Recent proliferation of the use of AI in education has coincided with the Vietnam Government's decision on "a national digital transformation programme until 2025 orientation to 2030" (Decision749/QD-TTg 2020) [5]. At a national level, Vietnam has demonstrated a strong policy commitment to AI in education through multiple government policies such as The National Strategy on Research, Development and Application of Artificial Intelligence until 2030 (Ministry of Science and Technology, 2021), Resolution No. 57-NQ/TW (2024) of the Central Executive Committee [6] that explicitly includes AI in its vision for educational innovation and Circular No. 02/2023/TT-BGDDT by the Ministry of Education and Training [7] introduces a Digital Competency Framework for Learners, which incorporates elements relevant to AI understanding, such as data literacy, algorithmic thinking, and ethical awareness in digital environments. Inclusivity is identified as a key area of digital transformation for education that prioritises providing schools and students in rural areas with access to the latest digital technologies and to develop digital literacy and competencies for teachers and pupils from different groups [8]. Although research has highlighted that Vietnamese teachers and students have high levels of interest in learning about AI [9], currently the development and application of AI in education currently have several challenges that include low levels of teacher confidence in ethical use, data privacy, and effective integration of AI in lesson design, fragmented support sys-

tems, and the absence of formal guidelines for embedding AI in subject-specific teaching, and uneven access to infrastructure and devices, especially in rural or underfunded schools. With recognition that AI in education is not just a technological shift, it is a profound opportunity to reimagine teaching and learning in a rapidly evolving world, educators and policymakers in Vietnam have recommended areas as priority for inclusive and effective development of AI in education including developing and scaling up competency-based professional development programme for teachers focusing on applied AI skills and ethics, integrate AI literacy and critical thinking into school curricula, fostering communities of practice for AI among educators and promoting peer-led learning and collaborative curriculum design, and expanding empirical research on AI-support teaching and learning models in the Vietnamese context.

2.1 Teachers' perspectives on AI in education

The relationships between AI and users are dynamic and multifaceted. As suggested by Ouyang and Jiao [10], these can include AI-directed, user-as-recipient, AI-supported, user-as-collaborator, and AI-empowered, user-as-leader. As AI technologies cross the boundaries between professional settings and everyday use, users of AI technologies navigate their roles simultaneously in different settings. In education, teachers play a critical role in the successful adoption of AI technologies in education practices. As mediators of the use of AI in education, they act simultaneously as learners, gatekeepers, facilitators, educators, co-creators / co-producers, and consumers of the use of AI in education [11, 12]. There are wide-ranging potential implications for the perspectives of current teachers on the use of AI in education in teaching and learning and professional development of teachers. Systematic reviews of current research highlight several key areas for educators, educators, researchers, AI creators, and policy makers to consider, including ethical and responsible use of AI, collaborations on AI and AIED development, paradigm shift of the pedagogical approach, changes in the role of teachers in education [13]. These key areas are embedded in the UNESCO AI competency framework for teachers [14]. Balancing the dynamics of multiple roles requires teachers to consider their own needs, the needs of their students, and the educational setting they work in (e.g., the demands of the curriculum, relevant school policies) while critically evaluating the use of AI. Recent research suggests that AI literacy can be a useful concept and practical tool for teachers to navigate such complex dynamics [1, 2].

2.2 AI Literacy

The latest systematic international literature on AI and AI literacy in K-12 education [1, 2, 15] has revealed the important role that AI literacy plays in the development of education in general AI. Current definitions and conceptualisations of AI literacy are generally situated within two broader theoretical fields, namely digital literacy (e.g., Long and Magerko [3]) and socio-technical systems (STS) (e.g., Almatrafi et al. [1]). Although the two theoretical perspectives focus

on different aspects of human-AI interactions where digital literacy foregrounds the practice and practical human experiences, and STS emphasises relationships, they share common characteristics such as user awareness and ability, their experiences and attitudes towards AI and the impact of AI on social practices.

Based on the widely used general AI literacy for non-AI experts conceptualised by Long and Magerko [3], AI literacy encompasses a set of competencies that enable teachers to recognise digital technologies that use AI and how AI works in those technologies (e.g., what data it draws and how it uses the data), recognise when and where AI is being used in education by teachers themselves, students, and other key stakeholders, critical evaluation of the value, impact, and implications of AI use in education and effective and responsible use of AI in teaching and learning. AI literacy has become a key topic of research and development in education as it plays a critical role in the responsible and effective application of AI technologies by teachers in teaching and learning. International systematic reviews have examined AI literacy in general [1, 16] and offered recommendations on AI literacy learning and assessment **(bid)**.

In Vietnam education research and practice, AI literacy is often applied with other models of teacher digital competence development. These include the Concerns-Based Adoption Model (CBAM) [17] that approaches digital technology adoption by identifying and addressing the concerns and challenges individuals might face when integrating new digital technologies into their work or personal lives; and the Technology Acceptance Model (TAM) [18] that focuses on explaining individuals' adopting new technologies through their perceived usefulness and ease of use of the technologies. In this study, these models are used with AI literacy concepts as theoretical tools to interpret the findings.

Beyond the digital and socio-technical perspectives, AI literacy is also closely related to computational thinking, which refers to the problem-solving skills involved in formulating problems and solutions compatible with computer systems [19]. Developing AI literacy therefore requires learners and educators to have some knowledge of data and algorithms due to their central role in AI. Embedding computational thinking into AI literacy frameworks thus promotes transferable understanding, empowering teachers not only to use AI tools but also to critically assess their outputs and limitations. Shute, Sun, and Asbell-Clarke [20] argue that computational thinking should be integrated into curricula toward a scaffolding of how digital systems function. However, misconceptions often persist as educators engage with AI tools. For example, Hwang and Tu [21] note that AI is frequently introduced into the classroom as a functional tool without explaining how it works, contributing to perceptions of AI being authoritarian. Misconceptions are not necessarily exclusively due to lack of training, but, according to Lupetti and Murray-Rust [22], also due to the design of AI systems themselves. Lupetti and Murray-Rust's concept of *AI Magic* shows how interfaces and patterns of interaction can encourage false ideas of autonomy or even sentience of AI. To counteract this, we argue that AI literacy should not only involve computational thinking but also promote transparency and ethical

design, enabling educators to interpret AI output as the result of underlying algorithms and data patterns.

In K-12 education, empirical research studies on AI literacy have highlighted areas of work for educators and learners [23]. Educators' AI literacy can directly impact on how they can introduce and integrate AI responsibly and effectively into their teaching and assessment practice to facilitate and support their student learning. Although currently, the focus has been largely on identifying the state of the AI literacy of educators to facilitate the responsible and effective introduction of AI into education; over time, the development of the AI literacy of educators will involve the development of their subject pedagogies. This is part of what the AI literacy literature refers to as 'learning with AI' [3].

3 Method

This paper reports emerging findings from an online mixed methods survey with teachers from eight high schools across North, Central, and South regions in Vietnam. It is the first phase of a large international project that focuses on pedagogical experiences, considerations, and needs from rural and urban areas in Vietnam for responsible and effective use of AI in high schools. The overall survey study addresses three research questions: RQ1: What are the features of AI literacy of current high school teachers in Vietnam? RQ2: To what extent do Vietnam high school teachers' AI literacy differ by their social and professional demographic groups? RQ3: What are the implications of current Vietnam high school teachers' AI literacy to education and computer science research and development at micro, meso and macro level?

The survey was designed by researchers in education and computer science from four universities in Vietnam and two universities in the UK. Currently, there is no AI literacy analysis tool for Vietnamese users, and none of the AI literacy analysis scales developed in education contexts up to 2024 have been tested for cross-cultural validity and measurement error [24]. The team reviewed a number of existing AI literacy evaluation tools and AI literacy frameworks (ibid), and decided to support the survey by the Long and Magerko AI Literacy Framework [3] and Delcker et al. AI competency domains for teachers [4]. This is because the wide use of Long and Magerko's framework can enable comparative discussions of this study with other similar studies and Delcker et al's work is most suitable for current development in Vietnam.

The survey includes the following sections and topics: 1) demographic information of the participants, 2) teachers' knowledge of AI, 3) teachers' experiences with using AI in everyday life, 4) teachers' experiences with using AI in education, 5) teachers' attitudes toward AI in general and in education, 6) teachers' confidence level with using AI in education. It included binary choices, Likert scale, multiple choices, and open-ended questions that focused on self-reported opinions and experiences. The survey was conducted in May 2025 via Google Forms. The participating schools were recruited through established networks of four pedagogical universities in Vietnam. The key selection criterion was to

ensure a balanced representation of urban and rural schools. The participants were self-selected from the eight schools.

Raw data from the online survey were downloaded, anonymised, encoded, and the quantitative data was cleaned through visual inspection and plotting. This included AI-assisted translation from Vietnamese to English, then inspected by researchers in England and Vietnam for accuracy. So far, demographic categories and questions were selected using the chi-squared and Kruskal-Wallis H tests to detect statistical significance signals across the data while considering key themes and issues from the literature. The next step is to conduct descriptive and inferential statistics (the Chi-square test for binary data, the Kruskal-Wallis H test and post hoc Mann-Whitney U tests for the Likert scale data) to understand how demographic characteristics affected the participants' self-reported AI literacy. Two researchers in England and a team of researchers in Vietnam first independently analysed the data and then cross-referenced the findings between the two teams. The total number of online survey participants was 543 from eight schools. Table 1 shows the number of participants in each of the characteristic groups. Table 2 shows the number of participants by school.

Table 1: Participant demographic profile.

Demographic Characteristic	**Number of Participants**
Gender	
Female	363
Male	175
Prefer not to Say	5
Ethnicity	
Kinh	493
Mường	2
Tày	5
Thái	37
Thổ	5
Invalid	1

Most participants have more than 10 years of teaching experience (36% with 10-20 years experience, and 37% with more than 20 years of experience), 3% of the participants have less than 2 years of teaching experience, 14% with between 2 and 5 years of experience and 9% with between 6-9 years of experience.

4 Findings

Table 3 shows the answers to the question "What do you know about AI?". 357 participants (65.7%) reported being aware of AI but with limited understanding. 23.8% 129 participants (23.8%) indicated a relatively clear understanding of AI

Table 2: Survey Participants by School

School Name	Location	Urban or Rural	Staff	Participants
Phan Huy Chu High School	Quoc Oai Province	Rural	62	16
The Experimental High School	Ho Chi Minh City	Urban	68	17
High school of Education Sciences	Hanoi	Urban	84	52
Yen Khanh A High School	Ninh Binh Province	Rural	75	58
Que Phong High School	Nghe An Province	Rural	91	59
Chau Phu High School	An Giang Province	Rural	64	69
Quy Chau High School	Nghe An Province	Rural	86	72
Nguyen Tat Thanh Secondary School	Hanoi	Urban		144
Invalid Entry				12

concepts. The majority (77.9%) recognised at least one AI-integrated technology, while 67.6% were able to cite specific examples. Participants were asked if they can give examples of technologies with AI applications from their professional and everyday lives, 367 of them said "Yes". Those who gave examples included technology used AI (e,g, ChatGPT) (n=181, frequency=49.3%), the applications of AI (e.g. voice recognition, robots) (n=41, frequency=11.2%) and tools/appliances used AI technology (e.g. smartphone, laptop) (n=16, frequency=4.4%). 80 participants (21.8%) also gave a mixture of examples. Of those participants who gave examples of technology used AI, ChatGPT and Google Gemini are the two most frequently mentioned by participants.

Table 3: Answers to "What do you know about Artificial Intelligence?"

Response	Frequency	Percentage
I am an expert, with a deep understanding of AI.	3	0.6%
I have a relatively good understanding of AI and how it is used in practice.	129	23.8%
I know what AI is, but my knowledge is limited.	357	65.7%
I've heard of AI but I'm not sure what AI is.	49	9.0%
I've never heard of artificial intelligence (AI).	5	1.0%

According to the data, 212 participants (39%) stated knowledge of some key ethical issues in using AI in education, 260 participants (47.9%) claimed limited knowledge of ethical issues, and 71 participants (13.1%) noted no awareness of ethical issues. 68.1% of the teachers said they can identify ethical issues when using AI and 31.9% said they can't. More information on AI ethics awareness is shown in Table 4; Most teachers expressed awareness of data security and privacy. 266 participants (49.0%) stated they do not know how to address ethical considerations when using AI in teaching, 256 participants (47.1%) described taking limited steps, and 21 participants (3.9%) stated they take active steps to

Table 4: Answers to “Which of the following ethical issues can you identify?"

Response	Frequency	Percentage
I can't identify ethical issues when using AI	88	16.2%
AI has an impact on the environment	116	21.4%
Bias, e.g., AI creates content that perpetuate societal biases	158	29.1%
Copyright, e.g., AI uses materials without consent	261	48.1%
Data Security, e.g., how the AI tool keeps the users' data safe	301	55.4%
Data Privacy, e.g., how the AI tool collects, stores and uses data	348	64.1%

address ethical considerations when using AI in teaching. 118 participants then provided relevant answers to the follow-up question that asked them to briefly describe the actions they had taken.

In terms of perceived strengths and limitations of AI, the strengths identified most frequently included time savings (82%), fast access to teaching resources (83.4%) and personalised student support (53%). Regarding the perceived social and educational impact, 54.5% of the teachers believed that AI would primarily bring positive impacts, although some noted potential risks. 47.7% viewed AI as having transformative potential for the education sector. In terms of the application of AI in teaching, 390 participants (71.8%) reported actively using at least one AI tool, noting that it was used mainly for administrative tasks and lesson planning. Of the participants, when asked if they were currently exploring how to apply AI in their teaching, 490 teachers (90.2%) answered yes and 53 teachers (9.8%) answered no; this indicates strong interest and recognition among teachers regarding the relevance and impact of AI in education.

Table 5: Answers to "If yes, through which channels do you learn about AI?" (multiple choice).

Response	Frequency	Percentage
Free online materials/courses	269	54.9%
School-organized training	267	54.5%
Colleagues at their school	225	45.9%
Professional groups and online communities	183	37.3%
Through AI tools themselves	130	26.5%
Colleagues from other schools	81	16.5%
Paid online courses	56	11.4%
Students	54	11%
Government or university-organized training	24	4.9%
Other channels	21	4.3%

The 490 teachers (90.2%) who confirmed continuing professional development in AI were asked about learning methods, observed in Table 5. 54.9% follow self-learning using free online materials, and 11.4% use paid courses. This suggests

that teachers are not yet ready to invest substantial resources into AI learning, often relying on basic introductory-level content. School-led training and peer sharing within schools also play an important role. However, schools often lack sufficient capacity to offer regular and high-quality training (for example, due to the reliance on external experts). Peer support is also typically reactive and situational. To improve access and quality of AI training, future efforts should focus on longer-term, well-structured training programmes, potentially with cost-sharing models supported by projects or institutions. Using experienced teachers as peer trainers can also help build sustainable internal capacity.

The emerging findings were as follows: **Gender** - Male teachers participated in AI training less than females ($U = 26440.5$, $p = 0.001$) and showed a lower awareness of limitations. **Region** - Urban teachers reported higher levels of AI training, understanding, and ability to cite examples. Rural teachers showed more optimism about the social impact of AI. **Experience** - Less-experienced teachers (0–5 years) had higher levels of uncertainty about the impact of AI on education, reflected in higher neutral responses in Q20.2 “What kind of impact does AI have on education?" (30.21%) and more “insignificant" ratings in Q20.1 “What is the perceived level of AI’s impact on education?" (6.45%). All chi-square tests did not show statistically significant differences by experience level (all $p > 0.05$), but the patterns remain noteworthy. Teachers with 5-10 years of experience demonstrated the highest understanding of AI and participation in training. The most experienced teachers (20+ years) reported the lowest levels of awareness and use. Teachers with less than 5 years of experience showed the highest engagement in applying AI for administrative tasks and teaching support and were more likely to view AI as transformative. In the future, a more comprehensive analysis will be performed, including inferential statistical analysis and qualitative analysis to address RQs 2 and 3.

5 Conclusion and Future Work

This study reveals a growing awareness among Vietnamese high school teachers about the role of AI in education. However, there is a noticeable gap between awareness and actual application, particularly among teachers in rural areas and those more experienced. There is also a knowledge gap in ethics, particularly with issues associated with environmental impact and potential bias. This emphasises the need for targeted professional development programmes that improve not only understanding of AI but also its ethical and effective use. This knowledge gap may be the result of the opaque black-box nature of many AI tools, especially proprietary products. Generative AI tools rarely provide insight into their underlying data, limitations, and failures, making it difficult for non-experts to develop accurate mental models of how these tools work. Thus, this may create barriers to confident classroom use and integration into the curriculum. Furthermore, emerging findings demonstrated significant differences in AI participation by gender, region, and experience, highlighting the need for context-sensitive professional learning approaches. These insights offer

valuable guidance for policy makers and educational institutions in designing future AI integration strategies within the education system. These differences also imply limitations of previous experience with digital technologies and lack of technical infrastructure. Hence, designing AI tools and training resources that function well in technical constraints while maintaining explainability is essential for equitable use. Furthermore, language support and cultural context remain under-addressed in many main AI tools [25].

In terms of professional learning for teachers, the findings suggest the need to strengthen teachers' capacity for self-directed learning and research, particularly in adapting to rapidly changing technologies like AI. Furthermore, the relatively high rate of peer discovery implies the value of organising peer support activities, such as collaborative learning sessions or professional learning communities, to help teachers share experiences and troubleshoot AI-related challenges together. In the co-design of digital systems between experts and end users (in this case, Computer Scientists and teachers), peer-based learning environments may also serve as living laboratories for the iterative improvement of technical tools. Partnerships between teachers and scientists to gather information and facilitate co-development can create more usable, trustworthy, and inclusive educational technologies to achieve positive impact in the real world [26, 27].

The survey findings will inform the design of Phase 2 of research with school leaders and teachers in the eight schools where each school will co-create a pilot project with the researchers to explore use of AI in teaching and learning. It will also inform the project's recommendations to educators and educational institutions about the current state of AI literacy of high school teachers and future directions of AI literacy development in Vietnam. Currently, there is no research that has focused on AI literacy of high school teachers on a national scale, this study aims to produce findings that can act as foundational empirical research for AI literacy research and development in Vietnam.

6 Ethics Statement

This study's research ethics is co-developed between researchers from Vietnam and the UK. It received ethical approval from the lead university's research ethics committee and adhered to the ethical guidelines of the British Educational Research Association (BERA) [28] and the UKRI framework for ethical research and innovation [29]. School principals received detailed participation information that summarised research activities, expected results, and ethical procedures, and were formally given access prior to distribution of the survey. All data is anonymous and participants received clear research ethics and consent information that describes data privacy and their rights to participate and withdraw data from the study.

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