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Artificial Intelligence Use in Learning Among Students at a High School in Quang Ninh Province, Vietnam

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Abstract

Generative artificial intelligence tools have entered the everyday learning of high school students faster than schools have produced guidance on their use. This study describes the current state of that use at one public high school in Quang Ninh province, Vietnam. A cross-sectional survey was administered to 124 students in grades 10, 11 and 12 during the 2025-2026 school year. The instrument contained a demographic section and sixteen four-point Likert items organised into three groups covering the frequency of AI use in learning activities, students' views on the effects of AI on their learning, and the difficulties they encountered. Data were processed in JASP. Internal consistency was .863, .831 and .846 (Cronbach's alpha) for the three groups. All students reported owning a smartphone and 51.6% had been using AI tools for more than twelve months, yet only 24.2% had received subject-specific guidance from teachers. Item means ranged from 2.52 to 2.73 on the four-point scale, and every item showed a dispersed response pattern in which between 19.4% and 31.5% of students selected the lowest level while between 27.4% and 37.9% selected the highest. The item on checking AI-generated content against textbooks was among the least frequently endorsed practices, while the item on inaccurate or curriculum-misaligned content received the highest difficulty rating. The findings indicate a gap between the availability of AI tools and the presence of school-level guidance on their use, and point to verification practice as an area for instructional attention.

Keywords:

Artificial intelligence; high school students; self-directed learning; survey; Vietnam.

1. Introduction

Generative artificial intelligence tools became publicly accessible at the end of 2022, and within two years they had spread through the study routines of secondary school students in many countries. The tools answer questions, explain concepts, produce worked solutions, translate text and generate practice material, and they do so without cost and without the institutional mediation that once accompanied educational technology. School systems have not kept pace. A survey of 450 institutions conducted by UNESCO found that fewer than one in ten schools and universities had a formal framework governing the use of these tools (UNESCO, 2023). Guidance published in the same period recommends that regulation address data protection, age-appropriate access and the pedagogical validation of tools before they enter classrooms

(Miao & Holmes, 2023). In the interval between adoption by learners and regulation by institutions, students form habits of use on their own.

Vietnam illustrates this pattern. The general education curriculum issued in 2018 places self-direction and self-study among the general competencies that all subjects are expected to develop (Bộ Giáo dục và Đào tạo, 2018), and digital competence has since become a reference point in national policy documents and in research on secondary schooling (Trịnh và cộng sự, 2024). Access to devices and connectivity has widened, and mobile access in particular is now close to universal among upper secondary students. Studies of AI use in Vietnam have so far concentrated on higher education. Surveys at Tan Trao University and at the Faculty of Engineering and Technology of Hue University report frequent use of ChatGPT for information retrieval, assignment completion and language practice, along with difficulties in formulating prompts and in judging the reliability of returned content (Đoàn, 2025; Nguyễn và cộng sự, 2024). Work on the school sector is more recent and has tended to focus on tool selection and on the assessment of digital competence rather than on how students actually use the tools day to day (Đặng và cộng sự, 2026).

This leaves a gap. Upper secondary students differ from university students in the degree of independence they exercise over their study time, in the assessment regime they face, and in the amount of adult supervision available to them. Their patterns of AI use, and the difficulties attached to those patterns, are not necessarily those observed in higher education. Evidence from provincial localities is scarcer still, since most Vietnamese studies have been conducted in Hanoi, Ho Chi Minh City or Hue. Descriptive data from a single school do not support generalisation, but they do provide a basis on which that school and others in comparable settings can plan guidance for students.

The present study describes the use of AI tools in learning among students at a public high school in Quang Ninh province during the 2025-2026 school year. Three research questions guide the analysis:

RQ1. How frequently do students use AI tools across a range of learning activities?

RQ2. How do students view the effects of AI use on their learning?

RQ3. What difficulties do students encounter when using AI tools for learning, and at what level?

The study offers descriptive data for one locality and a set of item-level results that a school can use when deciding where guidance is most needed. It does not test causal claims about the relationship between AI use and learning outcomes.

2. Literature review

Generative AI tools are language models that produce text, images or code in response to a prompt. In learning contexts their functions cluster into four groups: explaining concepts on demand, generating or solving exercises, producing practice and revision material, and providing immediate feedback on student work. These functions overlap with tasks that were previously performed by teachers, textbooks or peers, which is why their arrival has prompted questions about the division of cognitive labour between the learner and the tool.

Evidence on learning outcomes has accumulated quickly and points in a positive but qualified direction. A meta-analysis of experimental and quasi-experimental studies reports a positive average effect of ChatGPT use on academic achievement, with effect sizes that vary by subject

area, by the duration of the intervention and by the role assigned to the tool (Liu và cộng sự, 2025). Effects are generally larger where the tool is used under structured conditions with a defined task than where students use it without guidance. Survey studies of learner perceptions report a similar pattern. Students describe the tools as helpful for understanding concepts and for completing assignments, while expressing reservations about accuracy and about the appropriateness of use in assessed work (Ngo, 2023).

A second line of work concerns the cost side. Research on cognitive offloading reports a negative association between frequent reliance on AI tools and measures of critical thinking, with the association stronger among younger participants (Gerlich, 2025). The mechanism proposed is that when a tool supplies a finished answer, the learner has less occasion to perform the reasoning that the task was designed to elicit. This mechanism does not operate uniformly. It depends on what the learner does with the output, and in particular on whether the output is accepted as given or checked against another source. Verification is therefore not a peripheral skill but the point at which use either supports or displaces the intended learning.

Accuracy of output supplies the practical reason for verification. Generative models produce fluent text that may contain factual error, and their outputs are not aligned with any particular national curriculum. For a student working within the Vietnamese general education programme, an answer may be correct in general terms yet use notation, terminology or a solution method that does not match what the subject requires. Guidance documents accordingly recommend that institutions treat validation of content as an institutional responsibility rather than leaving it to individual learners (Miao & Holmes, 2023).

The third relevant strand concerns conditions of access. Device ownership, connectivity and the presence of instructional guidance vary across localities and shape what use is possible. Studies of digital competence among Vietnamese upper secondary students report uneven profiles across regions and school types (Trịnh và cộng sự, 2024), and school-level surveys in northern provinces indicate that students commonly encounter AI tools before any structured instruction about them (Đặng và cộng sự, 2026).

Taken together, these strands suggest three aspects worth measuring in a description of current practice: the frequency with which students use AI tools across different learning activities, the effects students attribute to that use, and the difficulties they encounter. These three aspects form the structure of the instrument used here. The framework is descriptive and is not intended as a model for predicting adoption behaviour.

3. Method

This study used a cross-sectional descriptive survey design. The site was a public high school in Cam Pha, Quang Ninh province, a coastal district city in northern Vietnam. Participants were 124 students enrolled in grades 10, 11 and 12 during the 2025-2026 school year. Whole class groups were invited to take part, and all invited students who completed the questionnaire were retained; the dataset contained no missing values on any variable.

The questionnaire had three parts. The first was an information and consent section describing the purpose of the study, the voluntary nature of participation and the treatment of responses. The second collected background information: gender, grade level, self-reported academic result for the most recent semester, devices available for learning, internet conditions at the place of residence, length and weekly duration of AI use, tools used, and guidance received from teachers. The third part contained sixteen items on a four-point Likert scale, organised

into three groups. Group 1 (seven items) measured the frequency of AI use across learning activities, with the anchors never, rarely, sometimes and often. Group 2 (five items) measured students' views on the effects of AI use, with the anchors disagree, undecided, agree and strongly agree. Group 3 (four items) measured the level of difficulty encountered, with the anchors no difficulty, low, moderate and high. Two optional open-ended questions closed the questionnaire. Items were drafted from the three aspects identified in the literature, reviewed by subject teachers at the school for wording and comprehensibility, and administered without further modification.

Data were collected through an online form during regular class periods; students responded on personal devices and were not asked for their names. Participation was approved by the school administration, parents were informed in advance, and students were told that they could stop at any point and that responses would not be used in any assessment of individual students.

All analyses were performed in JASP. Analysis was limited to internal consistency estimation and descriptive statistics. Internal consistency was estimated for each of the three groups using Cronbach's alpha and McDonald's omega, with item-level alpha-if-dropped values examined for each item. Descriptive statistics comprised frequencies and percentages for background variables and for each Likert item, together with item means and standard deviations. Interpretation of item means follows the interval convention for a four-point scale, in which 1.00 to 1.75 denotes a low level, 1.76 to 2.50 a level below the scale midpoint, 2.51 to 3.25 a level above the midpoint, and 3.26 to 4.00 a high level. No inferential tests were conducted and no subgroup comparisons were computed, so the results below are reported as description rather than as evidence of difference or association. Item N2_5 is worded in the direction opposite to the other items in its group; it was analysed in its original coding, and Section 4 reports its statistics separately from the interpretation of the remaining items in that group.

4. Results

4.1. Participant characteristics

Table 1 presents the background characteristics of the 124 participants.

Table 1. Characteristics of participants (n = 124)

Characteristic	Category	n	%
Gender	Male	65	52.4
	Female	59	47.6
Grade level	Grade 10	60	48.4
	Grade 11	24	19.4
	Grade 12	40	32.3
Self-reported result of the most recent semester	Good	22	17.7
	Fairly good	67	54.0

	Pass	33	26.6
	Not yet passed	2	1.6
Devices available for learning (multiple responses)	Smartphone	124	100.0
	Desktop or laptop computer	87	70.2
	Tablet	20	16.1
Internet connection at place of residence	Stable	103	83.1
	Intermittent	21	16.9
Length of AI use for learning	Not yet used	5	4.0
	Less than 6 months	20	16.1
	From 6 to 12 months	35	28.2
	More than 12 months	64	51.6
AI tools used (multiple responses)	ChatGPT	94	75.8
	Image-based exercise solving applications	62	50.0
	Gemini	49	39.5
	Translation or image generation tools	46	37.1
	Claude	9	7.3
	Copilot	7	5.6
	Other tools	6	4.8
Teacher guidance on AI use	No guidance received	19	15.3
	General guidance	75	60.5
	Subject-specific guidance	30	24.2

Weekly time using AI for learning	Less than 1 hour	20	16.1
	From 1 to 3 hours	50	40.3
	From 4 to 7 hours	39	31.5
	More than 7 hours	15	12.1

The sample was close to balanced by gender and weighted towards grade 10, which accounted for 48.4% of respondents. Every student reported access to a smartphone, 70.2% also had a desktop or laptop computer, and 83.1% described their internet connection as stable; no student reported having no connection. Exposure to AI tools was extensive: 51.6% had been using such tools for more than twelve months and a further 28.2% for between six and twelve months, leaving 4.0% who reported no use. ChatGPT was the most widely used tool at 75.8%, followed by image-based exercise solving applications at 50.0%. Weekly use was concentrated in the one-to-seven-hour range, which covered 71.8% of the sample. Guidance from teachers was reported by 84.7% of students, but in most cases at a general level; 24.2% reported guidance specific to individual subjects.

4.2. Internal consistency of the three item groups

Cronbach's alpha was .863 (95% CI [.828, .897]) for Group 1, .831 (95% CI [.780, .881]) for Group 2 and .846 (95% CI [.798, .894]) for Group 3. McDonald's omega gave values of .864, .832 and .848 for the three groups respectively. No item exceeded the alpha of its own group when removed: the alpha-if-dropped values ranged from .835 to .854 in Group 1, from .778 to .813 in Group 2 and from .791 to .828 in Group 3. Item N2_5, which is worded in the opposite direction to the remaining items of Group 2, produced an alpha-if-dropped value of .801, below the group value of .831, indicating that responses to this item covaried with the other items of the group in the same direction rather than in the opposite direction. This point is taken up in Section 4.4 and again in the limitations.

4.3. Frequency of AI use in learning activities

Table 2 reports the seven items of Group 1.

Table 2. Frequency of AI use in learning activities (1 = never, 2 = rarely, 3 = sometimes, 4 = often)

Item	M	SD	% (1)	% (2)	% (3)	% (4)
N1_1. Using AI tools to search for and clarify concepts or content not yet understood in lessons	2.52	1.17	27.4	20.2	25.0	27.4
N1_2. Using AI tools to find approaches to assigned exercises and learning tasks	2.65	1.19	24.2	21.8	19.4	34.7

Item	M	SD	% (1)	% (2)	% (3)	% (4)
N1_3. Using AI tools to plan learning or to organise the knowledge of a topic	2.64	1.14	22.6	21.0	26.6	29.8
N1_4. Using AI tools to practise and self-check knowledge before tests	2.54	1.23	31.5	14.5	22.6	31.5
N1_5. Using AI tools to support group work, learning projects or presentations	2.62	1.21	27.4	16.1	23.4	33.1
N1_6. Using AI tools to support foreign language learning, such as translation, writing or listening practice	2.57	1.15	23.4	26.6	20.2	29.8
N1_7. Checking AI-generated content against textbooks or other sources before using it	2.54	1.21	29.8	16.1	24.2	29.8

The scale mean for Group 1 was 2.58 (SD = 0.88 per item; sum score M = 18.07, SD = 6.14). Item means fell within a narrow band from 2.52 to 2.65, all of them just above the scale midpoint. The highest values were obtained for using AI to find approaches to assigned exercises (M = 2.65) and to organise the knowledge of a topic (M = 2.64). The lowest values were obtained for searching and clarifying content not yet understood (M = 2.52), for practising before tests (M = 2.54) and for checking AI-generated content against textbooks or other sources (M = 2.54).

The distributions are more informative than the means. On every item the two extreme response categories together account for around half of all responses. Between 22.6% and 31.5% of students selected level 1 and between 27.4% and 34.7% selected level 4, with the middle categories thinner. The combined proportion selecting level 3 or 4 ranged from 50.0% on the foreign language item to 56.5% on the topic organisation and group work items. Item N1_7, on verification of AI-generated content, was selected at level 1 by 29.8% of students, the second highest proportion in the group after the item on test preparation.

4.4. Students' views on the effects of AI use

Table 3 reports the five items of Group 2.

Table 3. Views on the effects of AI use on learning (1 = disagree, 2 = undecided, 3 = agree, 4 = strongly agree)

Item	M	SD	% (1)	% (2)	% (3)	% (4)
N2_1. Using AI helps me understand lessons faster than studying on my own	2.61	1.17	25.8	17.7	25.8	30.6
N2_2. Using AI makes me more active in self-study at home	2.66	1.15	21.0	25.8	19.4	33.9

Item	M	SD	% (1)	% (2)	% (3)	% (4)
N2_3. Using AI increases my interest in learning	2.68	1.17	22.6	21.8	21.0	34.7
N2_4. Using AI contributes to improving my learning results	2.65	1.16	22.6	22.6	21.8	33.1
N2_5. Using AI reduces the amount of thinking I do when solving learning tasks	2.73	1.12	19.4	21.0	26.6	33.1

The scale mean for Group 2 was 2.67 (SD = 0.89 per item; sum score M = 13.34, SD = 4.47). The four items describing benefits produced means between 2.61 and 2.68, with agreement at level 3 or 4 ranging from 53.2% to 56.5%. Increased interest in learning received the highest mean among these four items (M = 2.68) and faster understanding of lessons the lowest (M = 2.61).

Item N2_5 states that AI use reduces the amount of thinking the student does when solving learning tasks. It recorded the highest mean in the group (M = 2.73, SD = 1.12), with 59.7% of students selecting level 3 or 4 and 19.4% selecting level 1, the lowest proportion of level 1 responses among all sixteen items. Read at face value, this indicates that agreement with a statement about reduced thinking was at least as common as agreement with statements about benefits, and that the two sets of statements were endorsed by overlapping rather than opposing groups of students, as the reliability analysis in Section 4.2 also suggests.

4.5. Difficulties in using AI for learning

Table 4 reports the four items of Group 3.

Table 4. Difficulties encountered when using AI for learning (1 = no difficulty, 2 = low, 3 = moderate, 4 = high)

Item	M	SD	% (1)	% (2)	% (3)	% (4)
N3_1. I do not know how to formulate questions so that AI tools return content matching the learning requirement	2.52	1.22	29.0	22.6	16.1	32.3
N3_2. Content provided by AI tools is at times inaccurate or not aligned with the school curriculum	2.73	1.21	24.2	16.9	21.0	37.9
N3_3. Device and internet conditions do not meet my needs	2.58	1.18	23.4	29.0	13.7	33.9

Item	M	SD	% (1)	% (2)	% (3)	% (4)
N3_4. I have not received specific guidance on the permitted scope of AI use in learning	2.68	1.22	25.8	17.7	19.4	37.1

The scale mean for Group 3 was 2.63 (SD = 1.00 per item; sum score M = 10.50, SD = 4.00). The highest rated difficulty was inaccurate or curriculum-misaligned content (M = 2.73), with 37.9% of students placing it at the highest level, the largest single proportion at level 4 across the sixteen items. The absence of specific guidance on the permitted scope of AI use followed (M = 2.68), with 37.1% at the highest level. Device and internet conditions were rated at M = 2.58 despite the high rates of device ownership and stable connection reported in Table 1. The lowest rated difficulty was the formulation of questions to the tool (M = 2.52), on which 29.0% of students reported no difficulty at all, the highest such proportion in the group.

5. Discussion

Three features of the results merit comment. The first is the distance between exposure and instruction. Four fifths of the students had been using AI tools for six months or more and all had a device on which to do so, while fewer than a quarter had received guidance tied to a specific subject. This ordering matches what UNESCO reported at the institutional level, where formal frameworks were present in under a tenth of surveyed institutions (UNESCO, 2023), and it is consistent with observations from Vietnamese higher education, where students reported using ChatGPT extensively while lacking pedagogical guidance (Đoàn, 2025). The pattern at this school is therefore not local in origin.

The second feature is the dispersion of responses. Every one of the sixteen items produced a distribution with substantial mass at both extremes, and item standard deviations lay between 1.12 and 1.23 on a four-point scale. Means clustered narrowly between 2.52 and 2.73, which places all sixteen items in the same interpretive band, yet the means describe few individual students well. The student body appears to divide into groups with contrasting practices rather than to occupy a common middle position. Reporting only group means would obscure this, which is why the percentage distributions are given in full in Tables 2 to 4. For planning purposes, the relevant fact is not the average level of use but the presence of a substantial group at each end.

The third feature concerns verification and its relationship to the perceived cost of use. Checking AI output against textbooks or other sources was among the least frequently reported activities in Group 1, while inaccurate or curriculum-misaligned content was the most highly rated difficulty in Group 3. Students identified the problem more readily than they reported the practice that addresses it. Alongside this, agreement that AI use reduces the amount of thinking done on learning tasks was the most widely endorsed statement in Group 2, and it was endorsed by students who also endorsed the benefit statements. Research on cognitive offloading describes an association of this kind between frequent reliance on AI tools and reduced engagement in reasoning (Gerlich, 2025), and meta-analytic evidence indicates that positive effects on achievement are conditional on how the tool is used rather than on use as such (Liu và cộng sự, 2025). The data here are cross-sectional and self-reported, so they describe co-occurrence and do not establish that one condition produces the other.

For the school, the results point to two areas of instructional attention. The first is verification: designing tasks that require students to state the source of an answer and to check it against the textbook makes the checking step part of the assessed work rather than an optional extra. The second is scope: a written statement of where AI use is permitted, where it is permitted with disclosure and where it is not would address the difficulty that 37.1% of students rated at the highest level. Guidance documents make similar recommendations at the system level (Miao & Holmes, 2023); the present data indicate that students at this school are aware of the gap.

6. Limitations

Four limitations bear on the interpretation of these results. Data come from one school and from 124 students, so the findings describe this setting and are not a basis for statements about upper secondary students in the province or the country. All measures are self-reported, including the academic result variable, and are therefore subject to social desirability effects and to recall error in the estimates of weekly use. The design is cross-sectional and the analysis is descriptive, with no inferential test conducted, so no statement about difference between subgroups or about association between variables is supported by these data. Finally, item N2_5 was worded in the direction opposite to the other items of its group but behaved in the reliability analysis as though it belonged with them; this may reflect the wording, the response format or the way students read the item, and the mean of Group 2 should accordingly be read as an aggregate over items that are not uniform in direction. A revised version of the instrument would separate items about benefits from items about costs into distinct groups.

7. Conclusion

This survey of 124 students at a public high school in Quang Ninh province during the 2025-2026 school year describes a setting in which access to AI tools is close to universal while structured guidance on their use is not. All participants had a smartphone, 83.1% reported a stable internet connection, and 79.8% had been using AI tools for six months or longer, yet only 24.2% had received guidance specific to a subject and 37.1% rated the absence of guidance on the permitted scope of use as a high-level difficulty. Across the sixteen Likert items, means fell in a narrow band from 2.52 to 2.73 on a four-point scale, all marginally above the midpoint, and the three item groups showed internal consistency values of .863, .831 and .846. The distributions behind those means were dispersed rather than concentrated, with between 19.4% and 31.5% of students at the lowest level and between 27.4% and 37.9% at the highest on every item, which indicates that a single average understates the variety of practice within the student body. Two results have direct implications for the school. Checking AI-generated content against textbooks or other sources was among the least frequently reported activities, while inaccurate or curriculum-misaligned content was rated the most difficult problem encountered, so students recognise the risk more often than they report acting on it. Agreement that AI use reduces the thinking done on learning tasks was the most widely endorsed statement about effects and came from students who also reported benefits, which suggests that the two are experienced together rather than as alternatives. These findings support attention to verification practice and to a written statement of the scope of permitted use, both of which are within the reach of a school without additional resources. The descriptive design, the single site and the reliance on self-report limit what can be concluded, and the direction of any relationship between the frequency of use and the perceived reduction in thinking remains open. Subsequent work at a larger number of schools, combining questionnaire data with interviews and with

observation of how students handle AI-generated content in specific subject tasks, would allow these questions to be examined more closely.

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