Knowledge, Attitude, and Practices Toward Ethical AI-Assisted Programming Among Filipino Computer Science Students

Izza Kyla Garcia Espinosa, Eduardo R. Yu II,

Department of MS Computer Science. AMA University

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ABSTRACT

This study Investigate how Filipino Computer Science students understand and handle ethical issues related to AI in programming. With artificial intelligence tools becoming common in coding, like code generators and debugging help students are experiencing big changes in their learning and how they develop software. These tools can make coding faster and help solve problems better, but they also bring important ethical challenges. Issues like academic honesty, data privacy, cybersecurity risks, and the reliability of AI-generated code are significant concerns. One worry is that students might misuse AI tools by submitting work that isn't their own, not properly checking AI suggestions, or exposing sensitive data. Such actions can harm both the security of information systems and students' programming skills. It's essential to check that students are not only technically skilled but also aware of ethical standards when using AI tools. The study used a survey with a structured questionnaire based on the Knowledge-Attitude-Practice (KAP) model to measure students' knowledge, attitudes, and actual practices regarding ethical AI. The questionnaire was validated by experts, ensuring its reliability. Results were collected from online surveys and analyzed to identify trends. The findings showed that most students have a good understanding of ethical AI and tend to have positive attitudes about using AI responsibly. Many students also reported good practices, like avoiding plagiarism and being careful with sensitive information. However, there are areas needing attention, particularly in being transparent about AI use in academic work and checking the accuracy of AI-generated code. The study emphasizes the need for better ethical training in Computer Science programs, suggesting that schools should develop clear guidelines to promote responsible AI usage. This will help prepare future developers for the ethical challenges they will face.

Keywords: AI-assisted programming, ethical AI, KAP, computer science students, cybersecurity awareness

INTRODUCTION

Artificial intelligence (AI) has rapidly transformed the landscape of software development and computer science education, becoming an essential component of modern programming practices. AI-assisted tools such as ChatGPT and GitHub Copilot are increasingly integrated into coding workflows, enabling users to generate code, debug errors, and enhance problem-solving efficiency. These technologies significantly improve students' learning experiences by simplifying complex programming tasks and providing immediate feedback, thereby increasing productivity and promoting deeper understanding (Atemkeng et al., 2024). This growing reliance on AI reflects a broader trend in education, where digital innovations continuously reshape how knowledge is acquired, applied, and shared, particularly in technical disciplines such as computer science. Despite these advancements, the widespread adoption of AI-assisted programming introduces critical ethical and security challenges that cannot be overlooked. One major concern is the potential misuse of AI tools in academic settings, especially when students submit AI-generated outputs without proper acknowledgment, thereby raising issues related to academic integrity (Kharroubi et al., 2024). In addition, students may unintentionally expose sensitive or personal information when interacting with AI systems, posing risks to data privacy and cybersecurity. AIgenerated code may also contain hidden errors, vulnerabilities, or algorithmic biases, which can compromise the quality and reliability of software if not critically evaluated (Omorog & Medina, 2020). Furthermore, there exists a noticeable gap between the rapid adoption of AI tools and students' awareness of their ethical implications. Previous studies emphasize that having knowledge does not necessarily guarantee responsible behavior, highlighting inconsistencies between what students know, what they believe, and how they act

(Andrade et al., 2020). These concerns underscore the need to examine not only students' technical competence but also their ethical preparedness in using AI technologies. In response to these challenges, this study aims to investigate the knowledge, attitudes, and practices (KAP) of Filipino Computer Science students regarding ethical AI-assisted programming. Specifically, it seeks to assess students' understanding of ethical AI principles, including academic integrity, data privacy, and the limitations of AI tools; evaluate their attitudes toward responsible AI use in terms of fairness, accountability, and transparency; and examine their actual practices when utilizing AI tools, such as verifying outputs, acknowledging AI assistance, and safeguarding sensitive information.

Moreover, the study aims to identify gaps and inconsistencies between knowledge, attitudes, and behavior in real-world academic contexts. By employing the KAP framework, which systematically examines the relationship between cognitive awareness, attitudinal perspectives, and behavioral practices (Kaliyaperumal, 2004; Andrade et al., 2020), this research provides a structured approach to understanding how students engage with AI technologies. By utilizing the KAP framework, this study offers a structured analysis of students' cognitive, affective, and behavioral responses to AI-assisted programming.

The findings are expected to provide valuable insights for educators, institutions, and policymakers in designing targeted interventions, such as integrating AI ethics into academic curricula, establishing clear guidelines for AI usage, and fostering critical thinking in evaluating AI-generated outputs. Ultimately, this study seeks to bridge the gap between ethical awareness and actual practice, helping to ensure that future software developers are not only technically skilled but also ethically responsible and prepared to navigate the complexities of an AI-driven environment (Asio et al., 2023).

Objectives of The Study

This study aims to provide an exploratory baseline analysis of how Filipino Computer Science students engage with AI-assisted programming, particularly in terms of ethical awareness and responsible use. Specifically, it aims to examine and compare students' knowledge, attitudes, and actual practices when using artificial intelligence tools in coding and software development tasks. The objectives of the study are as follows:

To determine the level of students' knowledge regarding the ethical use of AI in programming.

This includes assessing their understanding of key concepts such as academic integrity, proper attribution of AI-generated outputs, data privacy, cybersecurity risks, and the limitations of AI tools. The study aims to identify whether students are adequately informed about both the benefits and potential risks of using AI technologies in their academic work.

To evaluate students' attitudes toward ethical and responsible AI use.

This objective focuses on how students perceive the importance of using AI tools responsibly, including their beliefs about fairness, accountability, transparency, and trust in AI-generated outputs. It also examines whether students recognize the ethical implications of misuse, such as plagiarism, overreliance on automation, or negligence in verifying AI-generated code.

To analyze students' actual practices in using AI-assisted programming tools.

Beyond knowledge and perception, this study investigates what students truly do when interacting with AI technologies. This includes their habits in verifying generated code, disclosing AI assistance in their work, protecting sensitive information, and maintaining originality in their outputs. The goal is to determine whether their actions align with ethical standards.

To identify gaps and inconsistencies between knowledge, attitudes, and practices.

A key objective of this research is to examine whether discrepancies exist between what students know, what they believe, and how they behave in real-world scenarios. For instance, students may demonstrate high

awareness of ethical guidelines but fail to consistently apply them in practice. Identifying such gaps will help highlight areas that require further attention and intervention.

To propose recommendations for improving AI ethics education and policy implementation.

Based on the findings, the study aims to suggest practical and actionable strategies for educational institutions. These may include integrating AI ethics into the curriculum, developing clear institutional policies for AI usage, promoting transparency in academic submissions, and strengthening students' awareness of cybersecurity and responsible AI practices.

In simple terms, the goal is to develop a deeper understanding of students' readiness to use AI tools ethically by evaluating their knowledge, attitudes, and practices as interconnected factors. By identifying gaps between what students know and what they do, the research aims to provide evidence-based recommendations that can guide schools in fostering a culture of responsible, transparent, and ethical AI use among future computing professionals.

Related Studies

The body of related studies highlights the expanding body of literature examining the integration of artificial intelligence in education and programming practices, particularly focusing on ethical awareness and responsible use. Recent research emphasizes that AI-assisted programming tools are becoming increasingly prevalent among students, reshaping how coding skills are developed and applied. Atemkeng et al. (2024) explained that generative AI technologies are now frequently used in software development tasks, enabling learners to enhance productivity, automate repetitive processes, and solve programming challenges more efficiently. Similarly, Elinzano et al. (2024) noted that AI tools such as ChatGPT are widely adopted by students in the Philippines, serving as supportive learning aids that can improve coding performance and comprehension. However, these studies also suggest that while AI promotes efficiency, it may simultaneously reduce opportunities for deep problem-solving and independent thinking when overused. This growing reliance on AI tools reflects a global shift toward technology-driven learning environments, where automation and intelligent systems play a central role in shaping students' educational experiences.

In addition to technological adoption, several studies have explored students' knowledge and awareness of artificial intelligence, particularly in relation to ethical considerations. Kharroubi et al. (2024) found that university students generally demonstrate a moderate to high level of knowledge about AI concepts, including its benefits and associated risks. This finding is consistent with Chen et al. (2026), who reported that students possess a basic understanding of AI applications but often lack deeper, procedural knowledge needed to apply ethical principles effectively in real-life scenarios. In the Philippine context, studies such as Pantao et al. (2026) highlight that while students are increasingly exposed to AI technologies, their literacy in ethical AI usage remains uneven. These findings suggest that knowledge alone is insufficient, as students may recognize ethical concerns such as plagiarism, bias, and privacy risks but fail to translate this awareness into consistent responsible practices. Literature thus underscores the importance of examining not only students' knowledge but also how this knowledge influences their attitudes and behaviors.

Research on students' attitudes toward AI further reveals generally positive perceptions regarding its role in education. Paredes and Victoriano (2025) found that students tend to view AI-based tools as beneficial for enhancing learning and academic performance, demonstrating openness to integrating such technologies into their studies. Similarly, Al Zaidy (2024) reported that generative AI positively influences student engagement, motivation, and interest in learning, particularly in higher education settings. However, despite these positive attitudes, several scholars caution that such perceptions may sometimes reflect social desirability bias, where students express favorable views about ethical AI use without fully internalizing its importance Andrade et al. (2020). Moreover, concerns about overreliance on AI have been consistently raised, with studies indicating that students may become dependent on automated systems, potentially weakening their critical thinking and problem-solving abilities. These findings highlight a complex dynamic in which students appreciate the benefits of AI while simultaneously facing challenges in maintaining balanced and responsible usage.

Beyond knowledge and attitudes, prior studies emphasize the importance of examining actual practices, as behavior ultimately determines the ethical implications of AI usage. Asio et al. (2023) observed that while students often claim to use AI responsibly, inconsistencies remain in key areas such as acknowledging AI assistance and ensuring academic honesty. Similarly, Omorog and Medina (2020) found that many users lack sufficient cybersecurity awareness, which can lead to risky behaviors such as sharing sensitive data or failing to evaluate potential vulnerabilities in systems. Atemkeng et al. (2024) further described the concept of "functional ethics," where users focus on technical correctness, such as debugging or validating code, but pay less attention to broader ethical responsibilities, including transparency and accountability. These findings indicate that while students may demonstrate responsible technical behaviors, ethical transparency, particularly in academic contexts, remains a significant challenge. Literature consistently points to a gap between what students know and what they actually do when using AI tools.

This gap is further explained through the Knowledge–Attitude–Practice (KAP) framework, which has been widely applied in various fields to examine behavioral change. According to Kaliyaperumal (2004), knowledge serves as the foundation for shaping attitudes, which in turn influence practices; however, the transition from awareness to action is often the most difficult stage. Andrade et al. (2020) reinforced this concept by emphasizing that individuals may possess adequate knowledge and positive attitudes but still fail to adopt consistent and responsible behaviors due to contextual factors such as lack of policy enforcement or environmental support. Supporting this perspective, Sittitiamjan and Wuttidittachotti (2025) demonstrated that gaps between knowledge and practice are common in educational settings, particularly in areas involving cybersecurity and technology use, where behavior is influenced by institutional regulations and monitoring systems. In the context of AI-assisted programming, these findings suggest that students' ethical practices are not solely determined by their awareness or beliefs but are also shaped by external factors such as academic policies, access to training, and the learning environment.

Several studies highlight the role of educational institutions in addressing these gaps through structured interventions. Ali et al. (2024) emphasized that integrating AI ethics into curricula and establishing clear guidelines for AI use are essential strategies for promoting responsible behavior among students. Similarly, Asio et al. (2023) recommended the development of policies that require transparency in AI usage, particularly in academic outputs, to prevent misuse and enhance accountability. Co (2025) also noted that AI integration in Philippine education remains at an evolving stage, and there is a need for comprehensive frameworks that address not only technological adoption but also ethical and pedagogical considerations. These studies collectively emphasize that effective AI education must go beyond technical training and include ethical awareness, critical thinking, and responsible decision-making.

The reviewed literature demonstrates that while AI-assisted programming offers significant benefits in terms of efficiency and learning support, it also introduces complex ethical challenges that require careful attention. Existing studies consistently show that students generally possess a reasonable level of knowledge and positive attitudes toward AI but often struggle to translate these into consistent ethical practices. This gap between awareness and behavior highlights the need for further research, particularly in specific contexts such as Filipino Computer Science students, where cultural, institutional, and educational factors may influence AI usage. By building on these related studies, the present research aims to provide a deeper understanding of students' knowledge, attitudes, and practices toward ethical AI-assisted programming and to contribute to the development of more effective strategies for promoting responsible AI use in educational settings.

METHODOLOGY

Research Design

A **quantitative descriptive research design** was employed in this study to systematically describe students' knowledge, attitudes, and practices (KAP) toward ethical AI-assisted programming. This type of research design is appropriate because it allows the researcher to collect numerical data and analyze patterns, trends, and relationships among variables without manipulating them. In other words, the study focuses on observing and measuring existing conditions rather than conducting experiments or interventions.

The **quantitative approach** is used because the study involves measurable data gathered through a structured Likert-scale questionnaire. Each response can be converted into numerical values, making it possible to apply statistical techniques such as computing means, frequencies, and correlations. This approach ensures objectivity, consistency, and reliability in analyzing students' responses regarding their understanding and use of AI tools. It also allows the researcher to generalize findings to a broader population of similar students, making the results more meaningful in the context of computer science education.

The **descriptive component** of the design is intended to provide a clear and detailed picture of the current state of students' knowledge, attitudes, and practices. It answers questions such as: *What do students know about ethical AI? How do they feel about using AI responsibly? What do they do when using AI tools?* By describing these variables using statistical summaries (e.g., mean scores and interpretations), the study identifies patterns and trends among respondents. This aligns with KAP-based research, which emphasizes understanding the level of awareness, perception, and behavior within a specific group (Kharroubi et al., 2024; Andrade et al., 2020).

Meanwhile, the descriptive approach allows the study to summarize each domain of the KAP framework independently using mean scores and interpretations. By evaluating knowledge, attitudes, and practices side by side, the study highlights areas of strength as well as behavioral gaps such as discrepancies between ethical awareness and actual practice. This side-by-side comparison is particularly important in KAP studies, as previous research suggests that knowledge and attitudes do not always translate into corresponding actions (Kaliyaperumal, 2004; Andrade et al., 2020). Identifying these descriptive patterns helps reveal behavioral inconsistencies that can inform future educational or institutional interventions.

Another important reason for using this design is that it is well-suited for studying **real-world educational settings**, where variables cannot be controlled or manipulated. Students already use AI tools in their academic work, and their behaviors develop naturally within their learning environments. A descriptive approach allows the researcher to capture these authentic experiences and analyze them in a meaningful way. It also supports evidence-based conclusions about how ethical awareness translates (or fails to translate) into actual practices.

The use of a quantitative descriptive design strengthens the study by providing both a **baseline profile of students' ethical AI awareness and a structured comparison across knowledge, attitudes, and practices**. This approach ultimately supports the study's goal of identifying gaps between awareness and behavior and provides a solid basis for recommending improvements in AI ethics, education, and policy implementation.

Participants

This study involved 148 Filipino Computer Science students at the tertiary level, recruited through convenience sampling. Selection was based on participants' accessibility and their prior experience with AI-assisted programming tools.

Regarding gender distribution, the sample consisted predominantly of male participants, with females representing a minority, and a small subset electing not to disclose their gender.

Participants demonstrated diversity in demographic characteristics, including age, year level, and programming experience. The majority fell within the conventional college-age bracket of 18 to 29 years, suggesting most were undergraduates.

With respect to academic standing, participants spanned all year levels from first to fourth year, contributing to a broad spectrum of experience with programming and AI tools.

Respondents reported proficiency in a variety of programming languages, such as Python, Java, C#, PHP, and C++, reflecting diverse technical backgrounds. Furthermore, most participants had prior experience with AI-assisted programming tools, positioning them as appropriate evaluators of ethical AI use.

Participants were deemed well-suited for this investigation given their relevant academic preparation, programming competencies, and exposure to AI technologies, attributes essential for evaluating their knowledge, attitudes, and practices (KAP) regarding ethical AI-assisted programming.

Research Instrument

The primary data collection instrument used in this study was a structured survey questionnaire specifically designed to measure the knowledge, attitudes, and practices (KAP) of Filipino Computer Science students toward ethical AI-assisted programming. The questionnaire was carefully developed to ensure that it captures the three core constructs of the KAP framework in a clear, systematic, and measurable manner. It was administered in both pilot testing and actual data collection to maintain consistency in structure, wording, and response scale, while pilot testing was conducted to evaluate the clarity, reliability, and comprehensibility of each item before full deployment.

The survey begins with an introductory section that outlines the purpose of the study and provides important ethical considerations for respondents. Participants were informed that their involvement is voluntary, that they may withdraw at any time without penalty, and that their responses would remain anonymous and confidential. No personally identifiable information was collected, and all data were reported in aggregate form to ensure privacy and ethical compliance. This section also includes a consent statement, where respondents indicate their willingness to participate, reflecting adherence to standard research ethics protocols in human-subject studies.

The questionnaire is divided into four main sections, each serving a specific purpose in the study. The first section, Demographic Profile, gathers basic background information about respondents, including age, gender, year level, primary programming languages used, and prior experience with AI-assisted programming tools. These variables are essential for describing the sample population and for identifying possible patterns or differences in responses across demographic groups. The inclusion of these items allows for a more contextualized interpretation of the findings, particularly in understanding how exposure to AI technologies may vary among students.

The remaining sections follow a Likert-scale format, where respondents indicate their level of agreement with each statement using a five-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This format is widely used in KAP studies because it allows for the quantification of subjective perceptions, making it possible to analyze responses statistically. Higher scores correspond to higher levels of knowledge, more positive attitudes, and more responsible practices, providing a standardized way to interpret and compare results.

The second section, Knowledge on Ethical AI-Assisted Programming, consists of seven items designed to assess respondents' awareness and understanding of key ethical and technical issues related to AI use. These items cover fundamental concepts such as how AI-assisted programming tools function, risks associated with data privacy and security, the potential for errors and vulnerabilities in AI-generated code, and the presence of bias in AI systems. The section also addresses ethical concerns such as academic integrity, particularly the consequences of submitting

AI-generated outputs without proper disclosure, and the importance of reviewing and validating AI-generated code before implementation. This section aims to measure not only factual knowledge but also students' awareness of the broader implications of using AI tools responsibly.

The third section, Attitudes Toward Ethical AI-Assisted Programming, includes seven statements that evaluate students' beliefs, perceptions, and values regarding the ethical use of AI tools. These items explore how students perceive the role of AI in learning, whether they believe ethical considerations should be prioritized, and their views on responsibility, accountability, and the potential risks of overreliance on AI. For example, the questionnaire examines whether students believe that AI tools should be used as supplements rather than replacements for personal skills, and whether improper use of AI may affect future professional practice. This section is important because attitudes often influence decision-making and behavior, serving as a bridge between knowledge and actual practice.

The fourth section, Practices in Using AI-Assisted Programming, focuses on students' reallife behaviors and habits when interacting with AI tools. This section also contains seven items that assess how often students use AI tools in their coding tasks, whether they review and modify AI-generated code, and how they ensure the accuracy, security, and reliability of outputs. It further examines ethical behaviors such as avoiding the use of sensitive data in AI platforms, testing code for errors and vulnerabilities, acknowledging AI assistance in academic work, and relying on personal programming knowledge rather than blindly copying AI-generated solutions. This section is particularly critical because it captures actual practices, which represent the practical application of knowledge and attitudes in real-world situations.

The research instrument was designed to provide a comprehensive and balanced assessment of students' ethical engagement with AI-assisted programming. By integrating knowledge, attitudes, and practices into a single structured questionnaire, the instrument ensures that all dimensions of the KAP framework are thoroughly explored. Its standardized format, validated structure, and clear alignment with the study objectives make it a reliable and effective tool for generating meaningful, data-driven insights into students' ethical awareness and behavior in the context of AI use.

Validity and Reliability

Content validity refers to the degree to which an instrument adequately represents and measures the intended constructs. In this study, content validity was established using the **Content Validity Index (CVI)**, a widely used quantitative approach that evaluates expert agreement on item relevance. Three subject-matter experts with relevant backgrounds evaluated the 21-item questionnaire using a **four-point relevance scale** (1 = Not Relevant to 4 = Highly Relevant). Ratings of 3 (Quite Relevant) and 4 (Highly Relevant) were considered acceptable indicators of item validity.

Item-Level Content Validity Index (I-CVI)

The Item-Level Content Validity Index (I-CVI) was determined by dividing the number of experts who rated each item as either 3 (quite relevant) or 4 (highly relevant) by the total number of experts. The results revealed that all 21 questionnaire items, consisting of Knowledge items (K1-K7), Attitude items (A1-A7), and Practice items (P1-P7), obtained an I-CVI value of 1.00. This indicates that all three experts unanimously agreed that every item was relevant to the constructs being measured. Considering that the acceptable threshold for I-CVI is 0.78, the obtained value of 1.00 substantially exceeds the minimum requirement, demonstrating perfect expert agreement and excellent item-level content validity. Furthermore, all knowledge items were rated as either quite relevant or highly relevant, while the attitude and practice items likewise received unanimous agreement from all experts. This consistency suggests that each item accurately represents its intended construct, namely knowledge, attitudes, and practices toward ethical AI-assisted programming.

Scale-Level Content Validity Index (S-CVI)

To evaluate the overall content validity of the instrument, the Scale-Level Content Validity Index (S-CVI) was computed using two approaches. The S-CVI/Ave, which represents the average of all I-CVI values, was calculated at 1.00, indicating that the average relevance rating across all items was ideal. Similarly, the S-CVI/UA, which measures universal agreement among experts, also yielded a value of 1.00, signifying that every item achieved unanimous agreement from all experts. Both indices indicate perfect agreement across all questionnaire items, satisfying even the most stringent criteria for content validity assessment. Since an S-CVI value of 0.90 or higher is generally regarded as excellent, the obtained value of 1.00 provides exceptionally strong evidence of the instrument's overall content validity.

Summary of Expert Validation

The findings of the expert validation process demonstrate that the instrument achieved perfect item-level and scale-level validity. No items were removed or revised substantially because all items met and exceeded the accepted validity thresholds. Although the experts provided minor recommendations related to wording clarity and phrasing, these suggestions were incorporated into the final version of the questionnaire before its

administration. Overall, the expert evaluation confirms that the instrument adequately covers the constructs of knowledge, attitudes, and practices regarding ethical AI-assisted programming, is clear and relevant to the intended objectives, and is representative of the concepts being measured. As a result, the questionnaire is considered appropriate and ready for actual data collection.

Data Collection

Data was collected using an online survey, ensuring anonymity and voluntary participation.

The study acknowledged that social desirability bias could affect how people answered questions about their ethical views and behaviors. To reduce this risk, the researchers kept responses anonymous, made sure participation was voluntary, and clearly communicated that no personal information would be collected. Participants were also told that their answers would only be used for academic research and wouldn't impact their grades. These steps were meant to encourage honest and clear responses. However, since the study relied on people reporting their own answers, some bias might still be unavoidable.

Data Analysis

Descriptive statistics, such as means, standard deviations, and frequencies, were computed in this study.

RESULTS AND DISCUSSION

This section presents the study's findings based on the five research objectives. The results are discussed using the Knowledge, Attitudes, and Practices (KAP) framework.

Result of Objective 1: To determine the level of students' knowledge regarding the ethical use of AI in programming.

Table 1. Summary Of Students Knowledge Level on Ethical AI

Indicator	**Mean**	**Interpretation**
Awareness of AI risks	4.01	High
Understanding of ethical issues	3.95	High
Awareness of data privacy concerns	3.98	High
Ability to evaluate AI outputs	3.84	Moderate-High
Overall Mean	**3.97**	**High**

The findings revealed that students demonstrated a **high level of knowledge** (M = 3.97), indicating awareness of AI-related ethical concerns such as data privacy, bias, and code reliability. This aligns with previous studies showing that university students are generally informed about AI concepts and associated ethical risks (Kharroubi et al., 2024). Furthermore, research in the Philippine educational context confirms that college students are increasingly aware of emerging digital tools and their potential benefits and hazards (Pantao et al., 2026). Kasneci et al. (2023) similarly observed that students quickly acquire a high level of theoretical awareness of large language model capabilities and data security challenges.

However, high conceptual knowledge does not automatically translate into procedural capability. According to Chen et al. (2026), students usually have a basic understanding of what AI can do, but they don't really grasp how to use ethical principles in practical situations. This pattern is consistent with the Knowledge-Attitude-

Practice (KAP) framework, which suggests that cognitive awareness serves as a necessary prerequisite but does not guarantee practical competence (Kaliyaperumal, 2004). Students may recognize the risks of AI outputs but fail to consistently apply validation strategies when using AI-generated code (Omorog & Medina, 2020).

Result of Objective 2: To evaluate students' attitudes toward ethical and responsible AI use.

Table 2. Summary of Students' Attitude Toward Ethical AI

Indicator	**Mean**	**Interpretation**
Importance of ethical AI use	4.20	Very High
Responsibility in AI-assisted work	4.15	Very High
AI as a learning support tool	4.10	High
Concern about overreliance	3.80	Moderate
Overall Mean	**4.08**	**Very High**

Students showed **very positive attitudes** toward ethical AI use (M = 4.08), indicating strong agreement with responsible practices. This is consistent with prior research showing that students generally support ethical AI principles, with recent observations by Paredes & Victoriano (2025), who reported that higher education students in the Philippines display favorable attitudes toward integrating AI technologies into learning when framed around academic support. Similarly, Al Zaidy (2024) found that university students broadly support ethical frameworks and responsible innovation in digital learning environments.

Even so, it's important to carefully examine these high attitude scores. Research on KAP (Knowledge, Attitude, Practice) shows that when people report their attitudes, they often try to say what sounds good or socially acceptable. This means they might not truly believe or practice those attitudes in their daily lives (Andrade et al., 2020). Furthermore, the moderate rating regarding concern over AI dependency (M = 3.80) suggests that while students acknowledge the abstract risk of overreliance, they maintain high openness toward AI utilization. Park (2025) found that over 40% of programming students express ambiguity regarding responsible usage boundaries, which can foster passive over-trust and dependency during complex coding tasks (Gocen & Aydemir, 2021).

Result of Objective 3: To analyze students' actual practices in using AI-assisted programming tools.

Table 3. Summary Of Students' Practices in AI-Assisted Programming

Indicator	**Mean**	**Interpretation**
Reviewing AI-generated code	4.05	High
Testing and validating outputs	3.98	High
Avoiding sensitive data sharing	4.02	High

Acknowledging AI use in academic work	3.60	Moderate
Overall Mean	**3.91**	**High**

In terms of behavioral implementation, respondents reported generally responsible technical practices (M = 3.91), such as reviewing AI outputs and avoiding sensitive data exposure. This concentration on code safely aligns with what Atemkeng et al. (2024) described the concept of "functional ethics," where users prioritize system safety and correctness such as debugging or validating code, but pay less attention to broader ethical responsibilities. Elinzano et al. (2024) similarly noted that Philippine students readily utilize tools like ChatGPT as supportive learning aids for debugging while prioritizing technical completion. Becker et al. (2023) highlighted that while AI code generators reduce syntax friction, student practice revolves heavily around prompt iteration and functional verification rather than ethical self-reflection.

However, ethical transparency, specifically **acknowledging AI assistance (M = 3.60),** was the weakest practice domain. Asio et al. (2023) observed that while students frequently leverage AI tools for academic work, formal attribution and usage disclosure remain inconsistent. Cotton et al. (2023) noted that fear of academic penalty or ambiguous institutional policy often leads students to conceal AI assistance even when their attitude toward ethical integrity is positive.

Results of Objective 4: To identify gaps and inconsistencies between knowledge, attitudes, and practices.

Table 4. KAP Framework Comparison and Gap Analysis

Domain	**Mean Score**	**Strengths**	**Weaknesses**	**Interpretation**
Knowledge	3.97	High awareness of risks and ethics	May be surface-level understanding	Awareness present but needs deeper application
Attitude	4.08	Strong support for ethical use	Possibly socially desirable responses	Ethical beliefs are strong but not always internalized
Practice	3.91	Responsible technical behaviors	Weak transparency (AI acknowledgment)	Inconsistent application of ethics
Overall Gap	—	High KAP alignment generally	Practice lags behind knowledge and attitude	Indicates behavioral inconsistency

The comparison of Knowledge (**M = 3.97**), Attitude (**M = 4.08**), and Practice (**M = 3.91**) reveals that respondents achieved high ratings across all three domains. However, attitudes received the highest score, followed by knowledge and practice. This pattern suggests that students generally support ethical AI principles and possess substantial awareness of ethical concerns, but they do not consistently translate these beliefs into actual behavior.

As Kaliyaperumal (2004) emphasizes, bridging the gap between perception and actual behavior represents the most challenging phase of behavioral development. While knowledge provides awareness and attitudes shape intentions, actual practices are influenced by additional factors such as institutional policies, social norms,

monitoring mechanisms, and environmental support. Andrade et al. (2020) emphasized that positive attitudes and knowledge alone are insufficient predictors of ethical behavior, particularly in technology-related contexts.

The gap between attitudes and practices is most evident in the area of AI-use disclosure, where students demonstrate weaker transparency despite recognizing its ethical importance. Similar findings were reported by Sittitiamjan and Wuttidittachotti (2025), who found that cybersecurity-related behaviors often lag behind awareness and attitudes due to insufficient reinforcement and policy implementation. Likewise, Ali et al. (2024) highlighted the importance of institutional policies and ethical training in transforming awareness into responsible action.

Results of Objective 5: To propose recommendations for improving AI ethics education and policy implementation.

Based on the empirical findings, several approaches were recommended to help students become smarter, safer users of AI-assisted programming. Schools can play an active role by weaving AI ethics into the curriculum, offering lessons on ethical AI use, data privacy, and responsible coding (Ali et al., 2024; Kharroubi et al., 2024).

Beyond classroom instruction, institutions might organize workshops and seminars that give students hands-on experience with AI tools, deepening their understanding and awareness of security risks (Atemkeng et al., 2024).

Additionally, reinforcing academic policies by establishing clear guidelines for the use and acknowledgment of AI in programming assignments can set expectations for ethical conduct (Asio et al., 2023). Encouraging students to think critically by reviewing, analyzing, and validating AI-generated content before use fosters independent judgment and responsibility (Andrade et al., 2020). Promoting transparency and thorough documentation in AI-assisted work not only instills best practices but also helps build a culture of accountability within the student community (Sittitiamjan & Wuttidittachotti, 2025).

Ultimately, these strategies underscore the vital role educational institutions play in bridging the gap between theoretical knowledge and practical application. By offering thoughtful guidance, structured training, and unambiguous policies, schools empower students to navigate the evolving AI landscape ethically and confidently (Ali et al., 2024).

LIMITATIONS OF THE STUDY

There are a few important limitations to keep in mind when looking at the results of this study. First, since we used convenience sampling, the sample may not accurately represent all Filipino Computer Science students. Second, having mostly male participants could have swayed the overall findings and made it harder to generalize the results to all genders. Third, the study relied on participants reporting their own experiences, which can be influenced by what they think is socially acceptable or by their ability to recall information accurately. Lastly, the analysis mainly described the data without looking at any significant differences between different demographic groups. So, we need to be cautious about applying these findings more broadly than the participants involved in the study.

CONCLUSION

The study shows that Filipino Computer Science students generally understand AI-assisted programming well and have a good attitude toward using these tools responsibly. However, there are some inconsistencies when it comes to applying ethical practices, especially in being honest about using AI help and being transparent about it. While students appear to be knowledgeable about ethical AI-assisted programming and have positive views on it, their actions don't always align with that awareness.

The findings indicate that ethical behavior in using AI is influenced by individual knowledge and attitudes, but also by the support from their schools, enforcement of policies, and their educational experiences. Therefore,

universities should enhance education on AI ethics, set clear guidelines for using AI, and encourage a culture of openness and accountability.

To achieve this, academic institutions should implement a comprehensive and unambiguous AI Usage Policy. This policy must explicitly outline permissible and non-permissible use-cases of AI in schoolwork, explicitly covering academic honesty, open disclosure of AI contributions, clear cybersecurity protocols, and structured methods for verifying the reliability of generative outputs.

Grounding guidelines in a formalized institutional framework ensures that conceptual ethical awareness actively translates into consistent, professional, and transparent programming practices. Additionally, future research using more in-depth methods can help us better understand how ethical behaviors regarding AI develop and how to maintain them among upcoming professionals in computing.

Recommendation for Future Researchers

This study offers useful initial information about what Filipino computer science students know, how they feel, and what they do regarding their field. However, some aspects require further examination. Because this study only examined descriptive data, future researchers should use formal statistical tests to determine whether there are significant differences in how demographic groups use ethical AI.

Looking into how students at different academic levels understand ethics could show if awareness and practices improve as they progress in their studies and technical training. Additionally, researchers should investigate whether a student's language skills affect how well they understand and think critically about AI-generated documents and privacy policies.

Future studies could also expand on this quantitative data by utilizing a mixed-methods approach. Incorporating qualitative methods, such as reflective essays, open-ended survey questions, or focus group discussions, would allow students to explain the specific motivations behind their coding habits and ethical choices, offering a more nuanced view of the gaps between awareness and real-world practice. Finally, longitudinal studies could track how the introduction of formal institutional AI usage policies shapes and modifies student KAP scores over time.

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