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Embracing generative artificial intelligence tools in higher education: a survey study at the Hong Kong University of Science and Technology

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ABSTRACT

Generative artificial intelligence has emerged as a powerful technological innovation that is exerting a sweeping influence in the education sector. The rapid diffusion of ChatGPT in universities worldwide presents both opportunities and challenges to higher education policy and administration. This study seeks to examine students' behavioural and perceptual experiences with the use of ChatGPT at The Hong Kong University of Science and Technology, which was among the first universities worldwide to introduce officially protected ChatGPT services. Launched in November 2023, a university-wide student survey sampled 680 students from both the Hong Kong campus and the Guangzhou campus in Mainland China. The results indicate significant usage of ChatGPT services among the students and a very high level of intention to continue that use. The students perceive ChatGPT to contribute positively to both their learning and career development. Significant variations were found according to gender, level of study, age group, discipline, and country/region of origin, in terms of the students' experiences with ChatGPT. These results offer useful evidence for curriculum reform and the improvement of students' AI literacy in higher education institutions.

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Generative artificial intelligence; higher education; ChatGPT; Hong Kong; education policy

1. Introduction

In recent years, rapid advancements have been made in large language models that can perform complex natural-language processing tasks. Such technological progress includes improvement in the deep-learning algorithms of Generative Artificial Intelligence (GenAI) and growth in its computational power (Dwivedi et al., 2023). Indeed, GenAI has emerged as a powerful tool, revolutionizing various industries and transforming the ways that we interact with technology. Among the many advancements

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in GenAI, ChatGPT (Generative Pre-trained Transformer) has gained significant attention due to its ability to generate human-like text responses.

Generative AI tools have the potential to revolutionize higher education by providing personalized learning support to students (Chan & Hu, 2023; Raman et al., 2024), fostering creativity and collaboration (Kartal, 2024; Urban et al., 2024), offering intelligent tutoring (H. Li et al., 2024a; Raman et al., 2024; Vujinović et al., 2024), assisting with language tasks (Dwivedi et al., 2023; Lo et al., 2024), streamlining research and writing processes (Haman & Školník, 2023; Lingard, 2023), enabling efficient programming and data analysis (Papyshev, 2024; Vujinović et al., 2024; Yilmaz & Yilmaz, 2023), and supporting lifelong learning (Rawas, 2023). These tools empower students and educators, thereby enhancing the overall quality and effectiveness of higher education. Within just three months after its launch in November 2022, ChatGPT had reached 100 million users worldwide (Hu, 2023), and it became especially popular among university students, where strong peer influence led to strong usage intentions and rapid adoption (Raman et al., 2024).

While GenAI tools offer significant potential in higher education, they are accompanied by challenges and risks which have become increasingly recognized. A primary concern about tools such as ChatGPT is their potential to aid academic dishonesty (Cotton et al., 2023; Hua et al., 2024). Across many higher-education institutions, clear academic policies are still lacking, and that can create ambiguity for students attempting to navigate academic integrity (Perkins & Roe, 2024). There are additional concerns about the accuracy and reliability of the content generated using ChatGPT and its use in education (Gill et al., 2024). Generative AI-based content is not free from biases, and such biased content can thus interfere with academic learning if tools such as ChatGPT are used as a knowledge source (Motoki et al., 2023; Ray, 2023; Rutinowski et al., 2024). Therefore, a thoughtful and responsible approach to the integration of AI tools is necessary to ensure their effective and ethical use in enhancing the learning experience for students.

The rapid diffusion of ChatGPT in 2023 among university students and researchers worldwide caught leaders of the higher education sector in unprecedented challenges. The initial reactions of universities towards ChatGPT were diverse and shifted frequently. While some responded to the initial ‘anarchy’ of AI with a restrictive stance, others welcomed ChatGPT and attempted to integrate it within the wider university ecosystem. Of the top 500 universities in the world, fewer than one-third had a policy on AI usage by May 2023 (Xiao et al., 2023). Among the universities that did have an AI policy, 32.6% chose to ban ChatGPT, 14% had guidelines for students on how to use AI ethically, and 30% had guidelines for teachers on how to integrate AI into their instruction (Xiao et al., 2023).

Many studies in the past two years have sought to map out and explain the varying approaches of universities towards the use of GenAI (Abdaljaleel et al., 2024; Chan, 2023; Dai et al., 2024; Luo, 2024). Enabled by primary data collected from user surveys and ChatGPT usage, some recent studies have been able to examine the determinants and impacts of ChatGPT utilization in higher-education institutions. Without a doubt, such empirical studies are of great value for higher-education policymakers and university leaders in building a thorough understanding of the attitudinal and behavioural patterns of ChatGPT usage among students. *How do students perceive the usefulness of GenAI tools for their study and career development? What are the factors associated with students’ attitudinal stance toward and utilization patterns of ChatGPT? What are the perceptual and behavioral dimensions associated with such factors?* This

present study seeks to answer these questions using primary survey data collected from the Hong Kong University of Science and Technology (HKUST), a leading higher education institution in Asia with a global reputation. The study examines the behavioural and perceptual dimensions of ChatGPT usage among students using the Technology Acceptance Model (TAM). TAM posits perceived usefulness and perceived ease of use as key determinants of technology adoption. The present study extends this proposition by suggesting that demographic variations and technology literacy shape the patterns of technology adoption in higher education. AI literacy, as a moderating variable in this study, emphasizes the role of moderators in TAM and highlights how digital fluency shapes the relationship between GenAI adoption and its determinants.

This HKUST-based study is intended to be highly useful for the wider readership of higher education policy for two reasons. First, HKUST was the very first university in Hong Kong that not only embraced a liberal (yet rigorous) stance towards the use of ChatGPT, but it also became a pioneer in Asia by launching its own chatbot for the university community. Thus, a survey study of HKUST students helps us understand the outcomes of such pioneering pilots in the Asian context.

Second, HKUST is unique in its two-campus structure, with a new campus located in Mainland China, where ChatGPT is not officially allowed, and with student body demographics that differ between the two campuses. Whereas the Clear Water Bay (Hong Kong) campus has a larger population of Hong Kong and international students, the Guangzhou campus is predominantly attended by Mainland Chinese students. Those unique features allow us to investigate how students of varying origins and cultural backgrounds respond to GenAI tools in two different regulatory systems and contexts.

Fielded from October to November 2023, the survey sampled 680 students attending HKUST in an empirical investigation that focused on both the perceptual and behavioural dimensions of the students' ChatGPT usage. The survey was centred on four crucial dimensions: 1) the students' frequency of using ChatGPT, 2) their intention to use ChatGPT as a learning tool in the future, 3) their perception of the impact of ChatGPT on learning outcomes, and 4) their perception of the impact of ChatGPT on a future career or job. Our results found that age, country/region of origin, campus, and level of study had a significant effect on the ChatGPT experiences of the students at HKUST. While there was no difference in the frequency of using ChatGPT between male students and female students, there was a stronger perception of the impact of ChatGPT on learning outcomes and on careers and jobs in the male students than there was in the female students. The findings suggest that students studying at the mainland campus are more inclined to use ChatGPT and have a stronger perception of the impact of ChatGPT on their learning outcomes, careers, and jobs than students studying at the Clear Water Bay campus.

Our results also indicate that reliance on ChatGPT is higher among research postgraduate students than among taught postgraduate and undergraduate students at HKUST. In addition, the students in interdisciplinary programmes appear to rely more on ChatGPT than those in other programmes do. Moreover, students with higher AI literacy tend to be more forthcoming about using ChatGPT and are more likely to see its impact on learning outcomes and career opportunities than less familiar students are. Finally, AI literacy appears to moderate the relationship between demographic and/or descriptive variables, such as age and level of study, and the identified factor—*ChatGPT experiences*.

The remainder of this paper is organized as follows. [Section 2](#) reviews the nascent literature on GenAI in the higher-education sector. The research context and methodology are outlined in [Section 3](#) and [Section 4](#), respectively. [Section 5](#) presents the empirical results and our interpretations. [Section 6](#) presents the conclusions that can be drawn from the findings and discusses the implications for higher-education policy and administration.

2. Literature review

The existing literature on the different experiences with ChatGPT documents a variety of theoretical frameworks for explaining individuals' adoption and engagement with technologies, such as the technology acceptance model (TAM), the unified theory of acceptance and use of technology (UTAUT), the diffusion of innovations theory (DOI), the theory of planned behaviour (TPB), and others. The present study roots itself primarily in the TAM, which posits that the decision to use technology is dependent upon its perceived ease of use (the degree to which a user believes that using the technology is free of effort) and its perceived usefulness (the degree to which a user believes that the technology will enhance his or her job performance) (Davis, 1989; Wen et al., 2015). While TAM posits the foundational determinants of technology adoption, how the perception of the impact of technology on one's performance and the moderating variables such as AI literacy shape behavioural and perceptual dimensions of GenAI usage need to be examined.

2.1. Perceived ease of use

In the context of generative AI tools such as ChatGPT, students may be more likely to use such tools if they perceive them to be easy to use. Perceived ease of use can lead to continued usage of technology, ultimately increasing the usage intensity that can be operationalized as the duration of usage or frequency of usage, thereby enhancing overall technology acceptance (Kleine et al., 2024; Wolf & Maier, 2024). *Familiarity with technology* is a key determinant of its perceived ease of use, which, in the case of students, can enhance learning outcomes, overall learner satisfaction, and learner confidence with using tools such as ChatGPT (Almulla, 2024; Roganović, 2024; Tummalapenta et al., 2024).

2.2. Perceived usefulness

Perceived usefulness has been found to have a direct, positive influence on one's frequency of use and continued intention to use ChatGPT (Kleine et al., 2024; Wang et al., 2022). In the context of academic learning, learners who have positive attitudes towards the usefulness of ChatGPT tend to demonstrate a higher level of behavioural intention that positively predicts their actual use of it (Abdaljaleel et al., 2024; Almogren et al., 2024; Dahri et al., 2024). Hence, a high perceived usefulness of ChatGPT in students may predict a high *frequency of use* and a high *intention to use ChatGPT in the future*. Furthermore, students' perception of ChatGPT's usefulness has been found to be

positively influenced by their sense of control over its usage and to have a strong positive link with their overall attitude in favour of using ChatGPT in their education (Almogren et al., 2024).

2.3. Perception of the impact of ChatGPT on one's performance

As with the perceived usefulness in TAM, performance expectancy is a determinant of the use intention towards a technology (Venkatesh et al., 2003). In the context of ChatGPT, performance expectancy could manifest in one's perceived impact of the technology on one's *learning outcomes* or the value that the skills and knowledge gained through ChatGPT add to one's *future job opportunities*. Concepts related to performance expectancy, such as outcome expectations, job fit, and the like, can predict learners' intention to use ChatGPT (Kelly et al., 2023; Menon & Shilpa, 2023; Strzelecki, 2023).

2.4. Role of AI literacy

The facilitating conditions around the technology are a key determinant of the technology's acceptance and its continued usage (Venkatesh et al., 2012). These conditions entail the knowledge, skills, and resources needed to use the technology. Literacy about AI is a key skill that can influence the usage of AI tools such as ChatGPT. The user's knowledge of AI has been found to have a direct, positive influence on the usage of AI-related technology, its perceived ease of use, and its perceived usefulness, and thus ultimately lead to AI acceptance (Cao et al., 2021; Jing et al., 2024; Schiavo et al., 2024).

A review of the recent literature shows that the factors which influence student interactions with ChatGPT in a university setting can be explored by assessing the perceptual and behavioural dimensions associated with those interactions. These dimensions include the frequency of usage, intention towards continued use, and expectations of a positive impact on performance in terms of learning outcomes or career opportunities, among others. However, the vast user base of a popular technology such as ChatGPT is not a homogeneous group—users are diverse in terms of gender, age group, and several other characteristics. The existing scholarship is scarce on how – in a university setting – diverse factors such as gender, age, the discipline of study, level of study, geographic setting, and the like impact the factors and dimensions (both perceptual and behavioural) that are associated with student interactions with ChatGPT. The present study fills this research gap by not just identifying the factors and variables that drive the interactions of HKUST students with ChatGPT but also by exploring how demographic and descriptive factors, such as gender, age group, and discipline of study, among others, may influence those factors and variables.

3. Research context

Hong Kong occupies a prominent position in the international higher-education landscape, being renowned for its world-class universities and commitment to academic excellence. The region's universities are consistently among the top in global university rankings, and they attract students and scholars from around the

world. In the 2025 QS World University Rankings, published by Quacquarelli Symonds, five universities (out of eight public universities in total) in Hong Kong were ranked among the top 100.¹ Founded in 1991, HKUST is a leading university in Asia with a global reputation in science, engineering, and business studies. It was ranked No. 1 in the Times Higher Education Young University Rankings in 2019² and 47th in the latest QS World University Rankings. Officially opening in September 2022, HKUST (GZ) is the university's Mainland campus, located in the City of Guangzhou. Under the framework of 'Unified HKUST, Complementary Campuses', students of both the Guangzhou campus and the Clear Water Bay (CWB) campus can take courses offered by both campuses, with credits being mutually recognized and automatically transferable. There are active research collaborations between scholars of both campuses.

The Digital Education Council (DEC) Global AI Student Survey, conducted in 2024 by the DEC, a newly established global alliance of high-profile universities, gathered 3,839 responses across 16 countries from bachelor's, master's, and doctoral students in multiple fields of study, and further contextualizes HKUST's forward-thinking approach (Digital Education Council DEC - HKUST, 2024). From HKUST, 82 responses were collected. The survey highlights that 96% of HKUST students use AI tools in their studies—a significantly higher percentage than the global average. Globally, the report reveals that 72% of students believe universities should provide training on the effective use of AI tools, and 58% feel they do not have sufficient AI knowledge and skills, thus underscoring the universal need for targeted educational strategies. In addition, the survey found that 44% of HKUST students use AI tools weekly, with 23% using them daily, thus reflecting a high level of student engagement with AI-driven technologies.

Whereas most of its local sister universities were ambivalent towards the mushrooming ChatGPT in early 2023,³ HKUST stood out in its embrace of new GenAI technologies and gave instructors significant autonomy to create their own guidelines for its use.⁴ This included the university's issuing of policies and guidelines in early 2023 that provided guidance for teachers who wanted to ban, limit, or encourage the use of ChatGPT in their courses.⁵ Significantly, HKUST's stance led Hong Kong's universities to provide protected ChatGPT service to all staff and students in June 2023. The HKUST GenAI Platform operates on a secure and scalable cloud infrastructure, offering functionality akin to the public OpenAI's ChatGPT and ensuring that chat data are protected and accessible solely by the user.⁶ Faculty and students are encouraged to use GenAI tools in teaching and learning, with monthly prompt limits subsidized by the university. Additional tokens can be purchased by staff and students using a top-up system.

From August to October 2023, HKUST staff and students had access to four different models of Open AI's ChatGPT: gpt-35-turbo, gpt-35-turbo-16k, gpt-4, and gpt-4-32k. The number of distinct students, distinct staff users, and requests (i.e. prompts) increased each month during this period, as follows: 2,261 distinct students and 752 distinct staff accessed the HKUST GenAI Platform for a total number of 40,118 requests in August; 7,110 distinct students and 1,055 distinct staff accessed the HKUST GenAI Platform for a total number of 186,256 requests in September; and 7,964 distinct students and 1,086

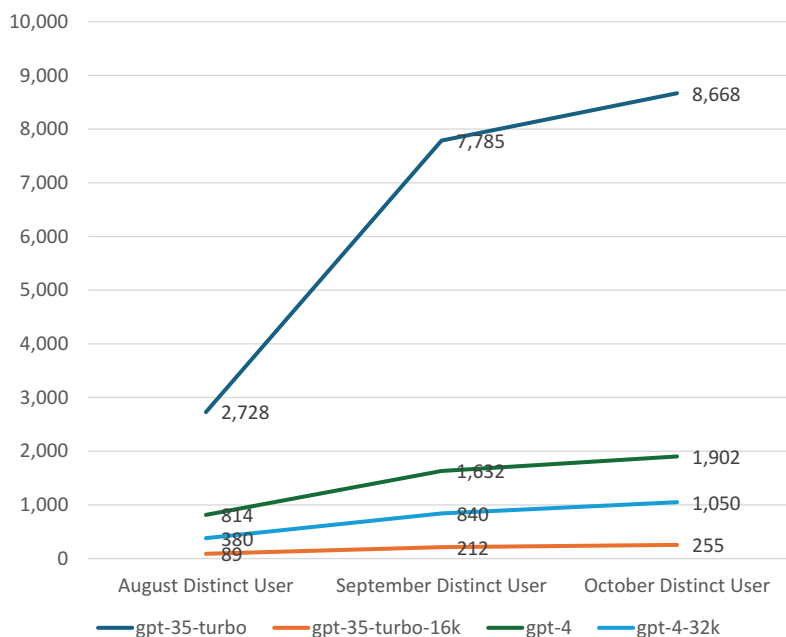


Figure 1. ChatGPT usage analysis. Source: the authors

distinct staff accessed the HKUST GenAI Platform for a total number of 274,756 requests in October. During these three months, the vast majority of users (>90%) did not exceed the assigned quota. [Figure 1](#) shows the platform usage by model type for each month.

4. Methodology

An online survey was launched in November 2023 to gauge the perceptual and behavioural dimensions of student interactions with ChatGPT, with data collection lasting for five weeks on the two campuses of HKUST. Ethical approval was obtained from the university. An official Qualtrics link was distributed through an internal mass email list of both campuses, inviting students to participate. Thus, a voluntary sampling method was used. Respondents were assured of the confidentiality of their participation and the sole purpose of research of this survey. Anonymous in nature, the survey did not require the entry of a student ID and password. The survey instrument contained four sections: 1) personal characteristics; 2) frequency of ChatGPT use; 3) technology literacy; and 4) self-reported impact of ChatGPT usage on students' learning and researchers' productivity. The survey instrument (Appendix 1) consisted of a variety of descriptive questions with multiple-choice responses and attitudinal questions with Likert-scale-based responses.

A total of 680 valid responses were received, accounting for 3.59% of the student population. Fourteen responses had missing data, with each response missing one of four different questions out of the questions considered in the main analysis.⁷ Of these four questions, only one question⁸ qualified for the factor analysis and was used in a logit regression, as explained in Sections 5.1 and 5.3, respectively. This question had six

Table 1. Sample description compared to the population of students at HKUST campuses.

Variables	Clear Water Bay Campus (Percentage in Clear Water Bay sample, $n_{cwb} = 403$)	Guangzhou Campus (Percentage in Guangzhou sample, $n_{gz} = 277$)	Overall Percentage (Total sample, $n_{total} = 680$)	Percentage (population)*
Gender				
Female	37.72	32.49	35.59	38.59
Male	60.05	63.90	61.62	61.41
Prefer not to say	2.23	3.61	2.79	–
Age group				
22 and below	63.03	40.79	53.97	–
23–27	28.54	49.82	37.21	–
28 and above	8.44	9.39	8.82	–
Country/region of origin				
Hong Kong	48.14	3.97	30.15	57.00
Mainland China	38.21	93.86	60.88	34.98
Others	13.65	2.17	8.97	8.02
Primary discipline				
Science	23.33	28.88	25.59	20.29
Engineering	40.69	37.18	39.26	35.77
Business & management	21.84	3.25	14.26	29.47
Humanities & social sciences	5.46	10.11	7.35	3.92
Interdisciplinary studies/others	8.68	20.58	13.53	10.55
Level of study				
Research postgraduate	17.87	72.56	40.15	16.81
Taught postgraduate	20.60	6.14	14.71	23.00
Undergraduate	61.54	21.30	45.15	60.19
Campus				
Clear Water Bay	–	–	59.26	90.78
Guangzhou	–	–	40.74	9.22

*This column only reports data where official statistics are available.

Source: authors' study and university official statistics.

responses missing due to the questionnaire's design in which a 'never' response to an earlier question⁹ automatically skipped this question. Because the number of responses with missing data was very low (less than 1% of the sample) and those responses were random, listwise deletion was used to address the issue of six missing responses, ultimately resulting in 674 responses for the final logit regression explained in Section 5.3.

Table 1 below reports the key characteristics of the sample, which was fairly representative of the overall student populations in terms of gender and primary discipline. Students from the Guangzhou Campus were oversampled to ensure an adequate sample size for analysis, and that approach resulted in a higher proportion of students from Mainland China and a higher percentage of research postgraduate students. This was the case because the majority of students at the Guangzhou Campus are from Mainland China and are enrolled in research programmes, leading to their overrepresentation in the sample.

Our empirical analyses involved two steps. We first used factor analysis to identify appropriate indicators from pertinent items in the survey, aiming to thoroughly capture both the perceptual and behavioural dimensions of the students' experiences regarding GenAI tools. Following that analysis, we conducted separate multivariate analyses on those dimensions to explore the influence of independent variables such as gender, age group, country/region of origin,

Table 2. Exploratory factor analysis results.

Factor	Key dependent variable	Factor loadings	Cronbach Alpha (Overall)	KMO ^a	P-value ^b
ChatGPT Experiences (perceptual and behavioural dimensions)	Frequency of use of ChatGPT	0.696	0.74	0.76	~0
	Intention to use ChatGPT as a learning tool in future	0.721		0.74	
	Perception of the impact of ChatGPT on learning outcomes	0.738		0.74	
	Perception of the impact of ChatGPT on future career or job	0.518		0.80	

^aOverall MSA (Measure of Sampling Adequacy) = 0.75.

^bP-value corresponds to the significance of the results from the Bartlett test of sphericity.

campus, level of study, and discipline of study on the identified dimensions. Given that the outcome variables were ordinal, we employed ordered logit regressions in our statistical processing.

5. Findings

5.1. Factor analysis

Exploratory and confirmatory factor analyses were conducted to determine the important variables for understanding students' interactions with ChatGPT and the dimensions associated with those interactions. We present the results in Table 2. Four key variables together formed a single factor, which we named *ChatGPT experiences*: 1) frequency of use of ChatGPT, 2) intention to use ChatGPT as a learning tool, 3) perception of impact on learning outcomes, and 4) perception of impact on future career or job. The decision to combine these four variables into a single factor was grounded in the factor loadings mentioned in Table 3 and the scree plot of eigenvalues. This one factor alone explained around 58.5% of the variance in the data. The reliability of this factor was strong (raw Cronbach $\alpha = 0.74$). The four variables were selected based on the factor loadings and other goodness of fit indices such as the Comparative Fit Index, Tucker-Lewis Index, etc. The first two variables associated with this factor (frequency of use and intention to use) related to the behavioural dimension, while the third and fourth variables represented the perceptual dimension (perception of impact on learning outcome and perception of impact on future career or job) of the ChatGPT experiences of the students.

The exploratory factor analysis entailed measurements of factor loadings, Cronbach's alpha, the KMO (Kaiser-Meyer-Olkin) value, and Bartlett's test of sphericity. We subsequently used a confirmatory factor analysis that established the reliability of the identified factor, *ChatGPT experiences*. The values of CFI (comparative fit index), RMSEA (root mean square error of approximation), SRMR (standardized root mean residual), and TLI (Tucker-Lewis Index) were assessed against acceptable ranges for confirmatory factor analysis.

Appendix 3 reports two stages of the confirmatory factor analysis: 1) the reliability of *ChatGPT experiences* as a factor, and the impact of independent variables and AI literacy on *ChatGPT experiences*, and 2) the moderating effect of AI literacy on the relationship between *ChatGPT experiences* and independent variables, such as age, level of study, and the like.

Table 3. Descriptive statistics of key variables.

Variables	Percentage
Frequency of ChatGPT use	
<i>'How frequently have you used ChatGPT as a research/study tool in the past month?'</i>	
1. <Once a week	15.74
2. Once-twice a week	20.15
3. Three to four times a week	19.41
4. More than five times a week	44.71
Intention to use ChatGPT as a learning tool	
<i>'How likely are you to continue using ChatGPT as a learning tool in the future?'</i>	
1. Very unlikely/2. Unlikely	1.78
3. Neutral	6.53
4. Likely	19.14
5. Very likely	72.55
Perception of the impact of ChatGPT on learning outcomes	
<i>Agree that ChatGPT contributes positively to learning outcomes</i>	
1. Strongly disagree/2. Somewhat disagree/3. Neutral	13.53
4. Somewhat agree	44.85
5. Strongly agree	41.62
Perception of impact of ChatGPT on future career or job	
<i>Agree that skills and knowledge gained from using ChatGPT are impactful to future career</i>	
1. Strongly disagree/2. Somewhat disagree	5.88
3. Neutral	20.29
4. Somewhat agree	40.44
5. Strongly agree	33.38
Knowledge of AI and programming skills (AI Literacy)	
<i>Know the basic principles/applications of AI?</i>	
1. Don't know	17.65
2. Roughly know	60.15
3. Know well	22.21
N	680

Source: authors' survey

The results from factor analysis yielded four important interpretations. First, although the RMSEA value (0.103) was slightly outside the acceptable limit, the acceptable values of CFI (0.979), TLI (0.936), and SRMR (0.028) established some degree of confidence in *ChatGPT experiences* as a key factor for indicating the perceptions and behaviours of HKUST students towards ChatGPT. Furthermore, robustness in the model was achieved with all CFA indices in an acceptable range once the effect of independent variables, such as age, gender, and the like, were considered. Second, we knew that age, country/region of origin, campus, and level of study have significant effects on the ChatGPT experiences of HKUST students, and hence, their effect has been included in the study. Third, AI literacy showed a strong positive effect on the ChatGPT experiences of students in the sample ($\beta = 0.267$, $p < 0.001$), meaning that a student with higher AI literacy was likely to be more forthcoming about using ChatGPT and was likelier to see its impact on learning outcomes and career opportunities.

Last, we found that AI literacy had a positive moderating effect on the relationship between the ChatGPT experiences and the students' age group and a negative moderating effect on the relationship between ChatGPT experiences and their level of study. This effect means that a higher AI literacy strengthens the positive impact of the increase in age on ChatGPT experiences by increasing both the frequency of use and the intention for continued use associated with it. On the other hand, AI literacy strengthens the positive impact of research as a level of study on ChatGPT

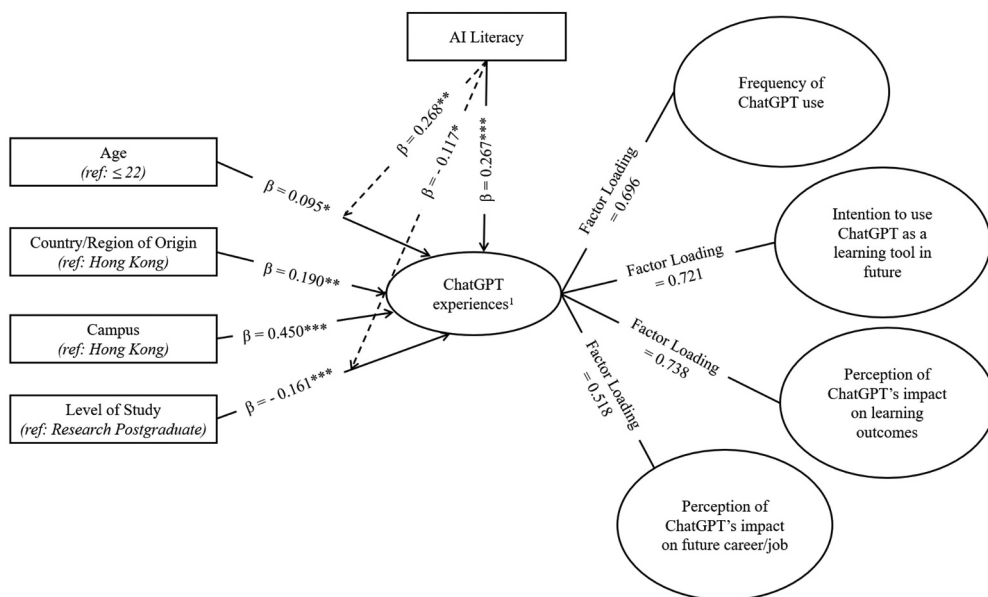


Figure 2. Representation of the identified factor, i.e. ChatGPT experiences, and the four variables underpinning the factor. Source: authors' study. $***p < 0.001$, $**p < 0.01$, $*p < 0.05$. ¹The model shows the identified factor, i.e. ChatGPT experiences, and the dimensions associated with ChatGPT experiences, i.e. frequency of ChatGPT use, intention to use ChatGPT as a learning tool in future, perception of ChatGPT's impact on learning outcomes, and perception of ChatGPT's impact on future career or job. Further, the model shows the independent variables that affect ChatGPT experiences for HKUST students and the moderation effect on AI literacy on the model. AI literacy moderates the impact of age and level of study on ChatGPT experiences. The coefficients have been derived from simple regressions, i.e. without controlling for other variables. A positive coefficient with significant values indicates that a change in independent variables has a positive impact on the ChatGPT experiences of HKUST students.

experiences, making research students more likely to use ChatGPT and continue using it. Conversely, the effect weakens when students are from other levels of study. Overall, the model with the variables affecting the ChatGPT experiences of HKUST students is presented in Figure 2.

5.2. Univariate and bivariate results

Following the identification of the four key variables that captured the behavioural and perceptual dimensions of students' interactions with ChatGPT, we now present a detailed analysis of each variable. Table 3 provides the descriptive statistics for these key dependent variables alongside AI literacy.

The data reveal that 44.71% of respondents reported using ChatGPT at least five times or more, thus indicating its significant adoption among the student body. Furthermore, 91.69% of respondents expressed their intention to continue using ChatGPT as a learning tool in the future, thus suggesting a strong perceived value in its utility and a high possibility that it could become an integral part of their learning process. In terms of

impact, 86.47% of respondents believed that ChatGPT positively influenced their learning outcomes, and 73.82% saw a positive impact on their future careers. These findings indicate that a large majority of students perceive ChatGPT to be a beneficial tool both in their current academic activities and in preparing them for their professional futures. Finally, 82.36% of respondents were identified as being AI literate (i.e. they roughly knew or knew well the basic principles/applications of AI), thereby indicating that the vast majority of students consider themselves to have a foundational understanding of AI. This suggests a broad familiarity with AI concepts among the student body, and that familiarity could support effective engagement with AI-driven tools such as ChatGPT.

To further explore the students' demographic influences on these key variables, cross-tabulations were performed against gender, age group, country/region of origin, campus, discipline of study, and level of study (as presented in Appendix 2). The χ^2 analysis yielded several notable findings.

The frequency of ChatGPT use was higher among students in the 23–27 and 28 and above age groups, compared with that in younger students, who typically are undergraduates. This suggests that older students, who potentially are facing more complex academic demands, may find relatively greater utility in AI tools such as ChatGPT.

Research postgraduate students reported using ChatGPT more frequently than their undergraduate and taught postgraduate counterparts did, and they also showed a stronger intention to continue using it in the future. This pattern is consistent with the nature of research postgraduate work, which often involves independent and complex research tasks for which AI tools may offer significant support.

Interestingly, ChatGPT usage was notably higher among students from Mainland China, with the students at the Guangzhou campus also reporting more frequent use and a stronger inclination to continue using ChatGPT compared with those at the Clear Water Bay campus. These differences might reflect different educational cultures, technological adoption rates, or academic pressures between regions.

The study conducted an early-late response analysis to assess the possibility of any non-response bias. The survey was launched in both campuses on the same date but there were two survey reminders in the Guangzhou campus and one reminder in the Clear Water Bay campus. The earliest date out of these reminder dates was categorized as early cut-off (all responses before this date were deemed 'early'), and the latest date was categorized as late cut-off (all responses after this date were deemed 'late'). The analysis revealed key differences, as shown in Table 4 and 5.

Among the categorical variables, significant differences were observed in age, country/region of origin, campus, level of study, and discipline between early and late responses, while gender showed no significant difference. Specifically, late respondents were slightly older, with a higher proportion of students from mainland China, from the Guangzhou campus, and enrolled as research postgraduate students. Late respondents had a lower proportion of engineering students and a higher proportion of students from science and interdisciplinary studies, as compared to early respondents. Early respondents were primarily from Clear Water Bay campus and had a higher proportion of undergraduate students than research postgraduate students and taught postgraduate students, respectively.

For Likert-scale-based variables, the frequency of ChatGPT use and intention to use ChatGPT as a learning tool showed significant differences, with late respondents

Table 4. Early-late response analysis of categorical variables (gender, age group, etc.).

Variable	χ^2 value	df	p-value	Frequency Percentages (Early Responses)	Frequency Percentages (Late Responses)
Gender	2.784	2	0.249	Female: 32.39% Male: 65.35% Prefer not to say: 2.25%	Female 37.36% Male: 58.79% Prefer not to say: 3.85%
Age Group	15.622	2	0	22 and below: 58.59% 23–27: 34.37% 28 and above 7.04%	22 and below: 40.66% 23–27: 48.35% 28 and above: 10.99%
Country/region of origin	64.051	2	0	Hong Kong: 36.9% Mainland China: 52.39% Others: 10.7%	Hong Kong: 9.89% Mainland China: 87.36% Others: 2.75%
Campus	127.723	1	0	Clear Water Bay: 66.2% Guangzhou: 33.8%	Clear Water Bay: 14.29% Guangzhou: 85.71%
Level of Study	40.341	2	0	Research postgraduate: 35.49% Taught postgraduate: 14.65% Undergraduate: 49.86%	Research postgraduate: 64.29% Taught postgraduate: 8.79% Undergraduate: 26.92%
Primary Discipline	11.633	4	0.02	Business studies: 14.93% Engineering: 40.56% Humanities and Social Science: 7.04% Interdisciplinary studies and others: 12.96% Science 24.51%	Business studies 6.59% Engineering 36.26% Humanities and Social Science: 8.79% Interdisciplinary studies and others 18.13% Science: 30.22%

Table 5. Early-late response analysis of likert-scale-based variables (frequency of use, intention to use as a learning tool, etc.).

Variable	t_statistic	p_value	Mean (Early Responses)	Mean (Late Responses)	Standard Deviation (Early Responses)	Standard Deviation (Late Responses)
Frequency of use	−2.351	0.019	3.896	4.132	1.18	1.059
Intention to use as a learning tool	−2.972	0.003	4.577	4.746	0.752	0.539
AI literacy	0.917	0.36	2.065	2.011	0.619	0.656
Perception of impact on learning	−0.662	0.509	4.245	4.291	0.795	0.749
Perception of impact on future career	−0.656	0.513	4	4.055	0.893	0.933

reporting slightly higher usage frequency and stronger intentions to use ChatGPT as a learning tool. However, no significant differences were observed in AI literacy or perceptions of ChatGPT's impact on learning outcomes or future career prospects.

The overrepresentation of early respondents from Clear Water Bay Campus and late respondents from Guangzhou campus might indicate institutional factors influencing response timing. Higher early responses from engineering and undergraduate students could represent enthusiasm and interest towards taking the survey. However, higher frequency of use and intention to use ChatGPT in late responses which also had a higher proportion of research postgraduate students may indicate a higher utility of ChatGPT perceived by research postgraduate students.

5.3. Multivariate results

Ordered logit regressions between the identified dependent variables and AI literacy, and the explanatory variables, were conducted to shed light on the nature of the relationships

Table 6. Multiple regression results.^a

	Frequency of use	Intention to use as a learning tool in future	Perception of impact on learning outcomes	Perception of impact on future career	AI literacy
Gender (ref: female)	Male	0.232 (0.148)	0.342 (0.155)*	0.314 (0.149)*	0.974 (0.168)***
Age group (ref: <22)	Prefer not to say	0.359 (0.476)	-0.043 (0.437)	-0.456 (0.439)	0.757 (0.457)
Country/region of origin (ref: HK)	23-27	0.720 (0.153)***	0.515 (0.158)**	0.204 (0.151)	0.427 (0.163)**
	28+	0.638 (0.331)	-0.185 (0.312)	0.348 (0.324)	0.061 (0.329)
	Mainland China	0.897 (0.159)***	0.583 (0.164)***	0.325 (0.157)*	0.239 (0.169)
	Others	-0.142 (0.266)	-0.270 (0.283)	0.150 (0.268)	-0.155 (0.310)
Campus (ref: HK)	Guangzhou	1.109 (0.151)***	0.523 (0.150)***	0.504 (0.146)***	0.116 (0.156)
Level of study (ref: Research postgraduate)	Taught postgraduate	-0.554 (0.218)*	-0.162 (0.224)	0.001 (0.220)	-0.459 (0.228)*
	Undergraduate	-0.786 (0.157)***	-0.451 (0.160)**	-0.285 (0.154)	-0.429 (0.168)**
Primary discipline (ref: science)	Engineering	0.079 (0.178)	0.500 (0.188)**	0.163 (0.180)	0.638 (0.198)**
	Business studies	-0.061(0.230)	0.445 (0.244)	0.373 (0.232)	-0.155 (0.258)
	Humanities & Social sciences	-0.090(0.293)	-0.246 (0.299)	-0.025 (0.294)	-0.225 (0.314)
	Interdisciplinary studies/others	0.792 (0.271)**	0.631 (0.265)*	0.379 (0.253)	-0.064 (0.274)
Observations	674	674	674	674	674

Source: authors' study.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. ^aThe results are from ordered logit regression models. The scores in parentheses are standard errors. The scores outside the parentheses are the regression coefficient values. A positive coefficient with a significant p-value indicates an increase in the dependent variable due to the respective change in the independent variable. The higher the value of coefficients, the higher the strength of the change. For example, A positive coefficient value for the *perception of impact on learning outcomes* in males indicates an increase in the perception of impact on learning outcomes in males than in females (reference variable).

between them. The results are given in [Table 6](#). The sample size for the ordered logit regressions was 674, as is explained in [Section 4](#).

5.3.1. Gender differences

Gender affected the students' perception of the impact of ChatGPT on learning outcomes and their perception of the impact of ChatGPT on future careers, with the results suggesting that males have a stronger perception of the impact of ChatGPT on both learning outcomes and careers than females do. In addition, the males appeared to perceive themselves to have higher AI literacy. However, there was no significant gender difference in the frequency of ChatGPT usage, although we did observe gender differences in the students' perceptions of ChatGPT's impact and their AI literacy confidence. This result suggests that although both genders use the tool at similar rates, their perceptions of its impact and their confidence in their AI literacy differ.

5.3.2. Age group effects

Age affected the students' frequency of use, intention to continue using ChatGPT as a learning tool, and perception of its impact on their learning outcomes in the 23–27 age group compared with the 22-and-under age group. Furthermore, the older age group had a stronger perception of having AI literacy compared with the ≤ 22 age group, perhaps because of the older students' greater exposure to and need for AI tools in their more advanced academic settings. The significant differences between the two age groups could have been a function of the 23–27 age group having had more exposure to ChatGPT, a greater academic need, and/or having had more opportunities to use ChatGPT.

5.3.3. Place of origin and campus effects

The coefficients for all four key dependent variables were significant and positive for the students from Mainland China compared with the students from Hong Kong, and the same was true for the students overall from the Guangzhou campus compared with those from the Clear Water Bay campus. Students from the Guangzhou campus seemed to be more inclined to use ChatGPT and to have a stronger perception of the impact of ChatGPT on learning outcomes/careers than students from the Clear Water Bay campus did. Moreover, the country/region of origin and campus outputs in regression tables appeared to be consistent with each other. A high correlation between the country/region of origin and the campus is possible, as the Clear Water Bay campus has a larger population of international students and Hong Kong students, while the Guangzhou campus is predominantly attended by Mainland students. This finding suggests that the educational environment and technological culture in these regions may play a role in shaping students' use of ChatGPT and their perception of its impact. The close correlation between the country/region of origin and campus highlights the need to consider these factors together when interpreting the results because the demographics of the campuses likely influenced these patterns.

5.3.4. Level of study

The 'undergraduate' variable negatively affected the frequency of use of ChatGPT, the intention to use ChatGPT as a learning tool, the perception of its impact on learning

outcomes, and the students' AI literacy compared with the 'research postgraduate' variable. This indicates that undergraduates, who may face different academic demands, rely less on ChatGPT than research postgraduates do. The 'taught postgraduate' variable similarly showed negative effects relative to the 'research postgraduates', although to a lesser extent. In other words, research postgraduate students appear to use ChatGPT more frequently and to have a higher intention to continue using it than undergraduate and taught postgraduate students do, thus suggesting differences in how students at different levels of study engage with the tool.

5.3.5. Discipline-specific effects

The variable 'engineering' positively affected the students' perception of ChatGPT's impact on their learning outcomes and their AI literacy, although it did not have a significant effect on their frequency of usage. This may suggest that engineering students recognize the potential benefits of ChatGPT for their studies but tend to use it selectively. Hence, the nature and intensity of usage could play a role in the variables that show positive and significant coefficients. The variable 'interdisciplinary studies/others' positively affected the students' frequency of ChatGPT use and their perception of its impact on learning outcomes. These results could be a function of the fact that interdisciplinary studies often have knowledge components that derive from multiple and diverse domains, and a user may not have expertise in all domains. Hence, students from interdisciplinary studies might want to use ChatGPT as a support tool for working with unfamiliar or less-familiar domains.

5.3.6. Effects with respect to AI literacy

The demographic differences in the study indicate a need for a strong emphasis on AI literacy for research postgraduate students. For example, postgraduate students showed higher frequency of use, higher intention to use, and higher AI literacy compared to taught postgraduate students and undergraduate students. Considering that the research students may focus more on professional and research development, they may consider ChatGPT as a tool for academic and professional success and AI literacy may support that engagement. This support is demonstrated by AI literacy's strong moderating effect on the relationship between the level of study and ChatGPT experiences. The moderating effect weakens for undergraduates and taught postgraduate students. Thus, research postgraduate students may potentially benefit more from AI literacy.

6. Discussion and conclusions

This survey study has sought to understand the outcomes of HKUST's pioneering practice of embracing GenAI from the student perspective. Zooming out from the statistical results, three observations of broader significance stand out. First, within just five months of its launch, the HKUST ChatGPT platform had recorded impressive usage, with almost two-thirds of the students in the sample using the tool more than three times a week. An overwhelmingly high intention of continued use was expressed by the student respondents, partly because of their highly positive perception of the tool's impact on learning and career development. Data from the DEC Global AI Student Survey 2024 report support this trend, showing that 96% of HKUST students reported using AI tools in their

studies, with 44% using them weekly and 23% daily—significantly higher numbers than the global averages (Digital, Education Council DEC - HKUST, 2024). Clearly, the ChatGPT service was already gaining widespread recognition in the HKUST community, where AI literacy is fairly high among the student population. As an ‘enabling factor’, the university’s embrative stance was conducive to the swift popularization of GenAI tools in the university. The findings from the univariate and bivariate analyses further emphasize the importance of AI literacy and its impact on students’ engagement with AI tools such as ChatGPT. With 82.36% of the students self-identified as AI literate, there is a strong foundation for further integration of AI into the curriculum. However, the variations in the levels of AI literacy and usage across different demographics, such as gender, age group, and level of study, highlight the need for targeted interventions to ensure that all students can benefit equally from AI tools. In addition, AI literacy appears not only to directly influence ChatGPT experiences but also to act as a crucial moderating factor between various determinants and ChatGPT experiences (as illustrated in Figure 2). Moreover, AI literacy differed by gender, age group, and level of study (see Table 4). Therefore, initiatives aimed at enhancing AI literacy will have significant policy implications. The DEC survey results further highlight the global importance of AI literacy, with 58% of students worldwide feeling that they do not have sufficient AI knowledge and skills, thus underscoring the need for targeted educational strategies at universities to close this gap (Digital Education Council DEC, 2024). These findings advance the understanding of the Technology Acceptance Model in the context of GenAI usage by emphasizing the role of AI literacy both as a direct variable and moderating variable in shaping GenAI adoption and the need for regular updates to AI usage policies in higher education institutions in response to rapid technological advancements.

Second, another notable finding from this study is the significantly high popularity of ChatGPT among Mainland Chinese students (at both campuses) and at the Guangzhou campus. Indeed, existing evidence suggests a generally positive attitude towards new technologies among the Chinese population. For instance, social acceptance of facial recognition technology (FRT) has been found to be significantly higher in China (67%) than in Germany (38%), the United States (48%), and the United Kingdom (50%) (Kostka et al., 2021). Similarly, the public acceptance of contact tracing apps during COVID-19 was found to be significantly higher for China (80%) compared with the United States (39%) and Germany (41%) (Kostka & Habich-Sobiegalla, 2022). Such attitudes are profoundly shaped by China’s huge investment in research and development, its keen desire to ‘catch up’, and its prioritization of efficiency and practicality (Gong & Yang, 2021; Kang et al., 2022; X. Li et al., 2024b). The DEC survey revealed that HKUST students were particularly proactive in using AI tools, with a higher percentage reporting daily use compared with students at other universities (Digital, Education Council DEC - HKUST, 2024). This finding aligns with broader trends in the adoption of technology within Mainland China and suggests a cultural and educational environment that is relatively more open to embracing disruptive technologies, such as ChatGPT, despite regulatory restrictions.

The higher usage rates among students from Mainland China and the Guangzhou campus suggest that these students may be more comfortable with and/or reliant on AI tools than their counterparts elsewhere are. Ensuring equitable access to AI resources within universities should be a priority. Moreover, the study’s differences in the perceptions of ChatGPT between male and female students suggest the need for

gender-sensitive approaches to promoting AI tools. Universities could develop initiatives to ensure that female students are equally confident in their AI literacy and perceive similar benefits from using these tools. In addition, the widespread adoption of digital technologies and mobile payment systems in China, such as Alipay and WeChat Pay, demonstrates a high level of comfort and acceptance of new technologies among the Chinese population. In comparison, Hong Kong's relatively mature and established financial and commercial sectors may lead its populace to a more cautious approach towards adopting new technologies, as stakeholders who prioritize stability, security, and risk management in their operations (Donald, 2020; Huang et al., 2022; Le, 2024). Hong Kong citizens are also found to hold relatively stronger concerns about privacy and data safety (Chan & Hu, 2023; Yiu et al., 2007), and such a conservative stance on embracing new technologies may lead to low receptivity of ChatGPT for Hong Kong students. As a result, we contend that Mainland-origin students tend to take a highly liberal and utilitarian stance towards disruptive technologies, such as ChatGPT, despite the regulatory restrictions in China.

Third, senior students, and particularly research postgraduate students, demonstrated a significantly higher appreciation of ChatGPT and more frequent use. With their increase in age and level of study, students usually face more complex analytical tasks, such as conducting literature reviews and learning new methodologies, for which ChatGPT can readily offer a rather quick and comprehensive response. The higher AI literacy that we found among research postgraduate students (and engineering students as well) may also lead to their continued use of such tools. This trend suggests that as students' progress in their academic careers, particularly in research-focused areas, their reliance on and satisfaction with AI tools such as ChatGPT increases, driven by the need for advanced analytical support. Likewise, students in interdisciplinary studies also face similar challenges in complex and transboundary tasks for which ChatGPT can provide useful assistance. These findings may offer meaningful clues for university-wide curriculum reform and tailor-made instructional programmes. Given the strong adoption and perceived benefits of ChatGPT among research postgraduates, universities could further support the integration of AI tools into research and postgraduate education. That integration might include providing specialized AI resources, training, and support that are specifically tailored to the needs of these students.

The findings further suggest that universities should consider the integration of AI literacy and GenAI tools into their broader educational strategy. Universities could benefit from developing mandatory AI literacy courses, particularly aimed at undergraduates and students from non-technical disciplines, to ensure that all students are equipped to leverage AI tools such as ChatGPT effectively. The DEC survey revealed that 72% of students believed universities should provide training on the effective use of AI tools, and an equal percentage expected additional courses on AI literacy (Digital, Education Council DEC - HKUST, 2024). Such an approach would not only bridge the current gaps in AI literacy but also would prepare students for the AI-driven demands of the modern workforce. Furthermore, with 58% of students feeling they did not have sufficient AI knowledge and skills, there is a clear need for targeted educational strategies at universities to address these gaps and ensure that students are prepared for an AI-enabled workplace (Digital, Education Council DEC - HKUST, 2024).

Moreover, the multivariate results indicate that demographic factors such as age, gender, and level of study significantly influence students' perceptions and usage of ChatGPT, thus suggesting that a one-size-fits-all approach to AI integration may not be sufficient. Tailored strategies that consider these demographic differences could enhance the effectiveness of AI literacy programmes and ensure that all students, regardless of their background, can fully benefit from AI tools.

Finally, the differences in AI tool usage between various demographic groups, and particularly the higher adoption rates among research postgraduates and Mainland Chinese students, suggest that tailored AI integration strategies could be more effective than they currently are. The DEC survey indicated that approximately 44% of HKUST students use AI tools weekly, with 23% using them daily, and ChatGPT emerged as the most widely used tool, thus reflecting a significant engagement with AI among the student body (Digital, Education Council DEC - HKUST, 2024). In that light, providing specialized AI resources and support for research-focused students could enhance their academic performance and research outputs. Moreover, an understanding of the cultural and educational factors that drive higher AI adoption among Mainland students could inform targeted policies that encourage broader acceptance and effective use of AI tools across all campuses. By addressing these nuances, universities can ensure that their AI integration efforts are both inclusive and impactful and that they are successfully positioning themselves as leaders in AI-enhanced education.

The survey used in this study was conducted in late 2023. Since then, the GenAI tools have continued to develop and been integrated into various use cases in higher education – integration into curriculum, evolving AI policies in universities, targeted AI training for teaching, learning, and research, and new pedagogical processes. However, the findings of the present study still hold strong relevance as they aim to highlight the foundational patterns of AI adoption experiences in a leading international university, thereby providing a baseline for the exploration of the trajectory for GenAI adoption. Such patterns can inform how institutions can adapt to future disruptions in AI technology and respond with flexible policy frameworks.

One limitation of the study is the voluntary sampling method, which may have introduced a self-selection bias as students with different familiarity or interest in GenAI tools may have been differently enthusiastic or reluctant about participating in the survey. Future studies may employ random sampling techniques to ensure that the positive effects of GenAI are not overestimated or underestimated. Further, those studies should also include perceptions and perspectives of instructors and administrators, which have been out of the scope of the present study, to provide deeper insights into variables such as institutional readiness and pedagogical competence.

Another limitation of the study is that the sample over-represents research postgraduate students and under-represents undergraduate students as compared to the population data in Table 1. It occurred because the students in Guangzhou Campus are predominantly enrolled in research programmes. Future studies should use normalized weights to enhance representativeness and assess if they affect the multivariate findings in cross-regional studies.

This study also showed some degree of non-response bias. The overrepresentation of early respondents from the Clear Water Bay campus and the late respondents from the Guangzhou campus may be attributed to institutional factors. However, the fact that late

respondents entailed a higher percentage of research postgraduate students and showed a higher frequency of use and intention to use ChatGPT may indicate a distinct value that research postgraduate students associate with ChatGPT.

Despite these biases, limitations and a single university focus, the contrasting results between the Guangzhou and Clear Water Bay campuses with diverse student demographics offer critical insights into cross-regional dynamics in GenAI adoption in higher education. The findings provide impetus for the incorporation of demographic variations and AI literacy as key factors while making higher education policies on GenAI. Furthermore, the focused study offers the potential for global institutions to learn from the localized experiences of these two campuses while also engaging in cross-institutional research in diverse contexts in the future.

Notes

1. QS World University Rankings 2025, retrieved from <https://www.topuniversities.com/university-rankings> (accessed on July 5 2024).
2. Young University Ranking 2019, retrieved from https://www.timeshighereducation.com/world-university-rankings/2019/young-university-rankings#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats (accessed on July 5 2024).
3. For example, University of Hong Kong banned the use of ChatGPT in all classes and forms of assignment for the remainder of the semester between February and mid-March 2023 (Cheng & Yim, 2024). In February 2023, Hong Kong Baptist University banned ChatGPT usage in classwork (Mok, 2023).
4. South China Morning Post, 'How will ChatGPT and AI transform education? HKUST expects big changes and is already preparing for it', May 21 2023, retrieved from <https://www.scmp.com/tech/article/3221151/how-will-chatgpt-and-ai-transform-education-hkust-expects-big-changes-and-already-preparing-it> (accessed on May 5 2024).
5. Center for Education Innovation, HKUST, Generative AI & Education, retrieved from <https://cei.hkust.edu.hk/en-hk/education-innovation/generative-ai-education> (accessed on January 25 2024).
6. Information Technology Services Center, HKUST, Generative AI Tools, retrieved from <https://itsc.hkust.edu.hk/services/general-it-services/generative-ai-tools> (accessed on January 25 2024).
7. The four questions that had missing data were: B6) *Have you ever used other generative artificial intelligence tools during the past 12 months?*; B9) *How likely are you to continue using ChatGPT as a learning tool in the future?*; D5) *In your view, do technology innovations more often lead to;* and D6) *To what extent do you agree that Generative AI is more of a threat or more of an opportunity for society?*
8. B9) *How likely are you to continue using ChatGPT as a learning tool in the future?*
9. The earlier question was: B5) *How frequently have you used ChatGPT as a research/study tool in the past month?* A 'never' response to this question skipped the following question due to lack of relevance: B9) *How likely are you to continue using ChatGPT as a learning tool in the future?*

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethical clearance

Ethical approval was obtained from the Hong Kong University of Science and Technology

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