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ORIGINAL RESEARCH

From Chat To Cheat: the Disruptive Effects of ChatGPT and Academic Integrity in Hong Kong Higher Education

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Abstract
The rapid adoption of AI-powered conversational agents such as ChatGPT is transforming the landscape of higher education in Hong Kong, offering both unprecedented opportunities for personalszed learning and complex challenges to academic integrity. This study investigates the perceptions and experiences of students across eight Hong Kong universities, employing a quantitative design that analyses questionnaire data from 200 students. Results reveal a pronounced polarisation: while students—particularly those with lower GPAs—appreciate ChatGPT's capacity to clarify complex concepts and facilitate research, their counterparts with higher GPAs express deep concerns about dependency, plagiarism, and the erosion of critical thinking skills. The findings underscore the urgent need for Hong Kong universities to implement comprehensive policies, advanced AI-detection tools, and targeted educational initiatives that foster a culture of integrity and responsible AI use. This research contributes to ongoing debates about the integration of generative AI in higher education, advocating for localised, policy-driven solutions that balance innovation with ethical stewardship.

Keywords Artificial intelligence · Academic integrity · Higher education · Perceptions · Hong kong

Introduction

Overview of Study

This study seeks to understand how students and lecturers in universities in Hong Kong perceive and experience the use of artificial intelligence (AI) 'chatbots' for academic purposes in higher education. In particular, the study seeks to better understand how student attitudes towards ChatGPT—a widely available, free-to-use AI chatbot—influences their behaviour when integrating conversational AI into their learning. The study utilises quantitative analysis of questionnaire data to explore how factors such as perception of technology, peer influence, and other contextual features might influence perception and behaviour. This contributes both to ongoing debates about the instrumental and ethical implications of the growth of AI technologies, as well as providing evidence to inform institutional policies and guidelines on the use of AI in academic work.

Background

The rise of artificial intelligence (AI) within recent years has transformed how individuals can access and generate academic content. The development and dissemination of AI 'chatbots' – programmes that can simulate human dialogue—permits everyday users to charge an AI with conducting research, process new information, or even produce academic content on their behalf [23]. Whilst earlier, rules-based architectures limited the capacity for computer programmes to produce bespoke content capable of emulating the output of a human student, AI chatbots harnessing large-language models (LLMs) are capable of mimicking human output, generating academic work that may be difficult to

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distinguish from work produced by students themselves [19].

The implications of this for education as a sector and at the specific level of higher education are beginning to receive significant academic attention. AI chatbots such as ChatGPT—a free-to-use and popular example of this technology—afford students many new advantages, such as functioning in lieu of a human tutor, or providing bespoke responses to inquiries on a certain topic, catering to the student's own learning needs [20, 21]. They likewise support students outside of classroom environments, supporting transitions towards learning programmes that blend online and offline elements, as well as supporting students outside office hours, reducing labour costs on behalf of universities [24].

On the other hand, a number of concerns have been raised regarding the ethics behind their use and the implications thereof with regards to academic integrity [33]. For example, [36] has queried for Forbes whether ChatGPT should be considered a 'threat to higher education', citing their alleged contributions towards academic plagiarism. Recent statistics from the UK report 5.1 proven cases of AI cheating for every 1000 university students [12], though difficulties in detection and lax plagiarism policies imply that the true number may be higher. Additionally, recent analysis of ChatGPT-generated abstracts in scientific publications revealed that human reviewers were unable to identify AI submissions in more than 34 per cent of cases [9]. True numbers may be difficult to define and likely also differ according to locale and educational culture.

Yiu (2025) reports that Hong Kong universities have elected to adopt a zero-tolerance policy for chatbot support and plagiarism, threatening expulsion for any student found using these applications without expressed, formal consent from university tutors. However, some researchers and educationalists advise that Hong Kong institutions embrace the AI 'revolution' [38]. This is supported to some extent by research evidence. For instance, some local studies highlight the potential of generative AI to transform essay writing and revision processes in higher education, demonstrating significant improvements in essay quality, increased student engagement, and enhanced motivation, while also revealing mixed emotional responses to AI-generated feedback [3–5]. This is supported by research from elsewhere, which suggests that AI support can help researchers develop their research skills and overcome methodological challenges encountered during research [25]. Alternatively, others note that even licit use may have negative outcomes, such as alleged impacts upon critical thinking and other academic skills [13]. As a new and fast-evolving technology, consensus has yet to emerge on the technology's broader implications for learning and education.

Accordingly, the future of AI chatbot support for student applications and university solutions is largely contingent upon the attitudes, policies and guidelines of those academics and administrators who are framing its emergent use and adaptation. As universities across the global community are confronted with the potential threat posed by AI chatbots to student integrity and academic ethics, it is important to analyse the current and future role of such technologies in meeting a range of academic goals and priorities. In particular, the zero-tolerance policy adopted by Hong Kong universities must be compared with the expectations and perspectives regarding AI chatbots of core inside stakeholders including students and teachers. This contextualises the overarching aim behind the research described below.

Literature Review

The recent emergence of AI chatbots has resulted in rapid and competing academic research as studies seek to weigh the array of ethical, techno-social, and systemic effects of these technologies. Accordingly, this section explores a variety of insights from the educational perspective, drawing upon various positions, both supportive and contrary, to interpret the range of variables that must be considered in this field. Through this critical review of the literature, a series of core concepts have been identified to test and analyse in direct relation to Hong Kong universities and their negotiation of chatbot technologies.

The AI Proposition in Education

As referenced above, the literature on the use of AI in education lacks consensus with respect to its evaluative position on the contributions and challenges provoked by its spread as a technology. As a revolutionary solution to consensus-seeking in the academic community, [13] propose that a sufficiently trained and competent chatbot has the potential to replace academics or educational systems. Although extreme, this reflects the level of opportunity and concern regarding the introduction of AI technologies in education and academa.

The need to explore and contend with the rise of AI is implied by the growing ubiquity of AI-powered technologies with everyday academic practice. For instance, the integration of AI chatbots into internet search engines such as Google and Bing means that AI output may be present at even preliminary stages of research, providing interpretations and suggestions for the student unprompted. The interactive characteristics of AI-supported chatbot applications invoke further disruptive and technologically radical effects on the way that users interact with search platforms

[31]. ChatGPT, for example, utilises a conversational search function to interpret user meaning or intention in their search directions, allowing users to gain access to creative and insightful information without requiring in-depth or even grammatically appropriate search prompts [13]. Some such as [34] have argued that this undermines the development of core academic skills, such as towards critical reading, evaluation/analysis, and academic writing. This reflects one of the core anxieties expressed across the literature.

Characterised by [31] p. 1) as 'smart essays,' chatbots have demonstrated proficiency in producing academic papers on a variety of topics, threatening the efficacy of university exercises and assignments. In a recent scientific review of ChatGPT capabilities, [25] confirmed that not only does the AI chatbot have the capabilities to interpret quantitative evidence and produce reliable scientific results, but it can be used to overcome academic challenges and difficulties both in designing and administering an empirical study. Whilst the researchers confirmed that there were many mistakes and omissions in the ChatGPT output, when combined with human intervention and progressively targeted queries within the chat environment, a sufficient research paper was generated that was grammatically consistent, accurate, and even well-referenced [25]. Known colloquially as 'hallucinations,' the tendency for chatbots to produce factual inaccuracies is largely a function of the learning process and the emergent nature of a native language model that is dependent upon human training [25] p. 2). However, as this paper acknowledges, arriving at accurate academic papers produced without human accuracy appears to be inevitable, prompting questions about the future of the human researcher in academia.

Such concerns must be balanced with the potential affordances of AI and its contributions towards individual knowledge. From this perspective, chatbots utilise collaborative relationships to assist humans in achieving a variety of educational goals. Whereas teachers have typically held the central role as pedagogical representative and authority, [19] argue that chatbots have the potential to augment this role by not only providing teachers with additional resources (e.g. lesson plans, essay questions), but allowing students to gain access to out-of-hours support and assistance with the chatbot as a form of surrogate teacher. Research tends to focus on the perspectives of students, however, with one meta-review of such research suggesting that students find utilizing conversational AI an engaging method of independent learning [39].

Despite such opportunities, there are potential limitations derived from the language-based nature of chatbot operations. [19], for example, highlight shortcomings in the accuracy or depth of the questions being posited and the reliability and validity of the answers being provided. Other studies have found that student revisions are less effective when guided by AI feedback as compared with feedback provided by human instructors [17]. In such cases, there are often differing findings across the body of literature, such as in the case of a study by [2] that found AI feedback to be comparable with human feedback. This confusion may contribute towards a perceived lack of action among universities in developing and enforcing AI policies across relevant courses of education.

As social networks and a collective acknowledgement of chatbot utilisation opportunities continue to expand student adoption, the normalisation of such technologies remains dependent upon models meeting specific usefulness qualifications [33]. For example, in an empirical assessment of educational experiences with chatbots, [33] observed that the quality including accuracy and reliability of the response (e.g. error free) was a critical predictor of student utilisation. Whilst the proliferation of such technologies is likely to result in greater support and utilisation, it is ultimately this expectation of high-quality, reliable, and valuable outcomes that predicts the perceived usefulness for the user base. This speaks to the *perspectives* of users and the interaction of these attitudes with student behaviour itself.

Student Behaviour and AI Chatbot Ethics

Central to the debate surrounding chatbot ethics is the idea of plagiarism, a widely discussed phenomenon that arises from both personal and systemic similarities in writing, particularly due to prompt replication and search overlap [30]. Whereas resources such as ChatGPT may elaborate upon individual ideas or prompts to produce a creative output that is inherently unique, Pophal [30] argues that issues surrounding ownership, creative license, and intellectual property rights (IPR) challenge the efficacy of fair use arguments. For example, if two students searched for the same prompt "a critical essay on the success of Chinese President Xi Jinping as a leader," the output may potentially be a replication of the insights weighed and extracted by the chatbot from various online and historic sources. At the same time, with the proliferation of remote learning and online coursework, [6] argue that student-driven self-paced learning often requires the assistance of a proficient and reliable search engine. Therefore, as a knowledge-enhancing resource, chatbots serve as virtual student assistants, replacing the role of the formal tutor and providing insights that are on-demand and topically-relevant [6].

Although freely available to student access, [20] caution that student usage of chatbots is likely to vary significantly, with technical skill sets, confidence in search behaviour, language proficiency, and learner anxiety all affecting the motivation to integrate these technologies into

their academic routines. In the past three years, however, there has been a significant increase in academic interest in student usage of chatbots, with key themes such as perceptions, affectation, proficiency, and behaviours driving the academic output [20]. Focusing on many of the positive effects of chatbot technologies, [21] suggest that as a tool for academic support, these resources can be used to assist students in research activities, to allow deeper understanding of complex problems or concepts, to assist in group or remote learning tasks, to empower learners with disabilities, and finally, for professional training, including in the educational sector (e.g. teachers, principals). As instruments of education, teachers may also adopt chatbot capabilities to improve lesson planning creativity, to support continuing professional development, and to accelerate routine tasks such as assessment or answer reviewing (e.g. plagiarism, cheating, replication) [21]. Such insights demonstrate an array of practical opportunities for deploying chatbots within the constructs of a responsible, policy-driven framework established by collaborative commitments between universities, students, and teachers.

Despite the potential academic advantages of chatbot support in search and analysis activities (e.g. discovering meaning, comparing perspectives), industry insiders suggest that in their current iteration, AI chatbots lack the depth and insight to offer students meaningful replacements for independent research and thought [36]. Yet, experimental findings by data scientists have also demonstrated how the potential complexity of chatbot solutions can lead to an impression of authority, allowing AI to achieve a level of plausible autonomy and innovativeness that threatens the integrity and authenticity of scientific research in some cases [36]. When weighed against the likelihood of plagiarism and potential lack of originality using advanced analytics software like Turnit-In and iThenticate, [22] observed that ChatGPT-generated essays had less than a 5% similarity score, suggesting that they were both original and unique. However, when reverse engineered, the researchers asked ChatGPT if the text was indeed generated by a chatbot and confirmed in 96% of the cases that it was indeed the result of such AI essay writing [22]. Such findings suggest that chatbot capabilities are likely to enable enterprising students to cheat more readily, but that detection systems are progressively evolving to attain more consistent results and reliable insights.

In a recent content analysis of TikTok videos related to ChatGPT, Malmström et al. [26] observed that the majority of posts were related to academic aids such as essay writing or othnsceer creative writing exercises (e.g. poems, letters, recipes). Despite achieving relative success with ChatGPT as a ghost-writing solution, much of the video feedback revealed ‘eloquent but incorrect answers’ as variables such as context, specificity, and general accuracy affected the chatbot outputs. As many post-Covid-19 university courses elected to continue online exam-taking and hybrid or online-only instruction formats, evidence suggests that AI assistance for student cheating is an increasingly significant problem [16, 26]. Although [32] suggests that it is possible to condition essay analytics and test grading according to variables in the responses such as relevance, clarity, accuracy, depth, and precision, the ability to reliably detect chatbot assistance in online courses and test taking is very limited and exposed to student exploitation.

Institutional Policies for Fairness and Accountability

Although much of the research in this field focuses on student accountability, [35] reports that many teachers are also considering the use of ChatGPT for lesson planning, coursework creativity, and assessment. Due to the challenges of Covid-19 instruction, teacher burnout and retention issues have led to a need for creative planning solutions, affording teachers additional time to focus on pedagogy and less time on menial tasks and grading [35]. In a critical weighting of learning effects, [37] confirmed that chatbot integration can improve micro lesson delivery and student assistance without requiring higher levels of teacher involvement. Further, evidence confirmed that student motivation increased in chatbot-supported learning groups as active engagement with the topic and deeper learning outcomes were reported amongst the sample population [37]. In English language learning courses, [18] have determined that chatbot technologies can simulate authentic language ecosystems, offer direct assistance to struggling learners, and provide supplemental interaction to improve the depth of the learning process. This all speaks to the benefits of an AI policy that permits some use on behalf of students for the purposes of education.

In some industries such as law or medicine, the advances offered by chatbot technologies are both radically disruptive and potentially threatening to the efficacy of practice [15, 28]. Although [28] suggests that chatbot solutions may augment specialised knowledge, the potential for displacement or a loss of personal agency may lead to a need for industry changes and protections for the efficacy of human personnel. In the legal industry, chatbot interpretation of legal scenarios may be contextually inaccurate or inconsistent with legal precedence; however, the ability to aid student cheating and essay writing makes adoption an attractive, integrity-threatening proposition [15]. Following the revelation that even the most attuned scientific minds were unable to distinguish between authentic, academic-written abstracts and those manufactured using ChatGPT, [9] recommends that formal policies and guidelines are needed to mandate

disclosure. Despite the potential ethical consequences of surreptitious deployment of chatbot communications, when universities and publications take a formal stance against AI papers and submissions, they are committing to the efficacy of fair and consistent human effort [9].

Conceptual Framework

Based upon this review of prior literature in this field, it is possible to distil the student usage proposition of chatbot technologies into a variety of key concepts. Figure 1 below visualises this relationship, highlighting an array of variables associated with the potential practical integration of chatbot capabilities at the university level.

The model in question theorises that chatbot search capabilities give rise to opportunities and limitations, corresponding with the mixed affordances and constraints associated with AI chatbots – as reflected in the literature referenced above [8]. This aspect to the model broadly corresponds with a Technology Acceptance Model (TAM) approach to the topic, with opportunities corresponding with the perceive usefulness of the model [27]. Interpretations of these opportunities and challenges are mediated through its social role, which normalises these perceptions and thus has the potential to influence user behaviour. In this regard, AI may be understood as constituting—and likewise being subject to—a social contagion. Within this model there are the various opportunities and limitations that initially frame the attraction of these technologies and the social contagion effects which promote chatbot usage through social media like TikTok videos. AI and cultures that develop surrounding it thereby influence adoption through processes such as social leaning and diffusion of innovation [1].

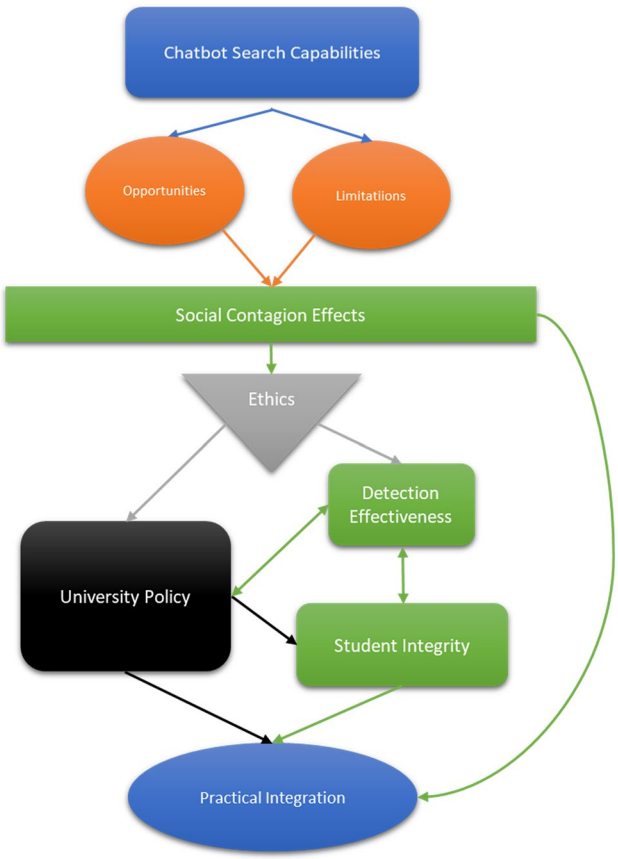


Fig. 1 Conceptual model

Ethics themselves serve as a kind of normative filter also, influencing university policies and the behavioural responses of users. This recognises the moral aspect of reactions to AI use and the influence of such. Moral agency theory notes that the ethical stances and responses of agents can interpret identical behaviours as responsible or exploitative based on interpretation of the underlying ethics (e.g., in act versus outcome [11]. Policies therefore interact with both detection practices and student integrity to mould how AI is integrated into education at a practical level – distinct here from institutional rules and state beliefs themselves. Moderating influences such as general ethics and university policy establish baseline controls but are impacted by the overall effectiveness of the detection technologies and the underlying integrity of the student body themselves. In other words, how AI should ideally be used may be distinguished from its actual use at least in part on the basis of the capacity and willingness of universities to identify and discipline students abuse AI from the perspective of the institution.

The the end result of practical integration is likely to have either positive or negative effects depending upon the degree to which a culture of academic integrity and rigorous university policy can be employed to restrict cheating, misuse, and opportunism. However, as the disagreement above the literature review implies, it may not be immediately apparent to universities under what conditions AI use becomes inappropriate (or appropriate) for students to engage in.

Research Questions

On the basis of the above literature review, a number of research questions may be identified in order to closing existing gaps in research in accordance with the conceptual model outlined above:

RQ1: How do perceptions of opportunities and limitations for AI chatbot use in education predict the degree of chatbot integration in practice?

RQ2: How do ethics, the policies of institutions, and mechanisms for AI detection interact to promote responsible use?

RQ3: How far do factors such as student integrity, GPA, and peer influence moderate the relationships identified across the conceptual model?

In order to test these relationships and to test the model more broadly, the following hypotheses have been designed and applied in the research methodology below:

H1a: Perceptions of opportunities afforded by AI chatbots positively influence practical integration.

H1b: Perceptions of limitations of AI chatbot technologies will negative influence practical integration.

H2a: The influence of peers, communities and social media (social contagion) moderates the relationship between opportunities and practical integration.

H2b: The influence of peers, communities and social media (social contagion) moderates the relationship between *limitations* and practical integration.

H3: Ethical awareness mediates the relationship between social contagion and practical integration, with stronger ethical values correlating with more constructive integration.

H4a: Awareness of university policy positively influences ethical awareness.

H4b: Perception of AI detection mechanisms as effective strengthens the relationship between ethical awareness and practical integration.

H5: Student integrity positively influences the relationship between ethical awareness and practical integration, leading to more legitimate usage of AI technology.

H6: GPA negatively moderates relationships between opportunities and practical integration.

Research Methodology

Paradigm and Approach

The study adopts a pragmatic approach, utilizing questionnaires posed to students and then subjected to quantitative analysis. narrative analysis to capture diverse perspectives. This methodology aligns with the study's objective of exploring complex and interconnected issues related to AI chatbots in higher education [7].

The questionnaire instrument was designed to assess perceptions of ChatGPT among university students. It included demographic questions and Likert-scale prompts on chatbot usage, measuring a number of factors that correspond with areas of the model above. For instance, scores for 'opportunities' were derived from questions pertaining to the perceived usefulness, efficiency and accessibility of ChatGPT, whereas scores for 'social contagion' were compiled from scalar responses to questions about the perceptions of peers, university lecturers, and online communities. These composite scores form the main items that are compared in accordance with the hypotheses outlined above and are detailed further in the results section below.

Sampling

A purposive sampling technique was employed to select participants from eight Hong Kong universities. Initially, students were approached through university contacts to take place in a research study on attitudes towards AI and were then filtered so as to provide a stratified sample, incorporating a range of academic disciplines, levels of study, and GPA scores. This was undertaken to ensure that the moderating effects of various variables could be meaningfully tested. Data was collected over three weeks prior to arriving at the final sample of 200 students drawn roughly equally from eight different universities in Hong Kong.

Statistical Modelling

The conceptual model outlined in Fig. 1 was subjected to Structural Equation Modelling (SEM) using AMOS 29. Practical Integration is positioned as the endogenous construct predicted by scores for Opportunities, limitations, Social Contagions, Ethics, University Policy, Detection Effectiveness, and Student Integrity. GPA and Peer Influence also serve as moderators across this process.

Confirmatory Factor Analysis upheld the latent constructs as valid (factor loadings >0.60; AVE >0.50; CR >0.70), whilst reliability was again evaluated using Cronbach's α. Model fit was thereafter evaluated and found to be satisfactory ($\chi^2/df<3.0$, CFI >0.90' TLI >0.90; RMSEA <0.08). Hypotheses 1 through 6 were inspected to indicate direction and significance of path coefficients, whilst the mediating effects (social contagion – ethics – integration, for example) were assessed using confidence intervals. Moderating effects (GPA and Peer Influence) were evaluated using latent-interaction terms in accordance with the product-indicator method.

Data Analysis

Analysis of data was carried out using IBM's *Statistical Package for the Social Sciences* v29.0 (SPSS) [30]. Descriptive analysis was carried out to provide summarised variables regarding student attitudes towards ChatGPT and other measured factors. This was followed by testing the hypotheses, incorporating the use of Pearson's correlation and t-tests to analyse bivariate relationships, as well as multiple regression to test predictive effects and moderation. The findings of these tests are presented in the section that follows.

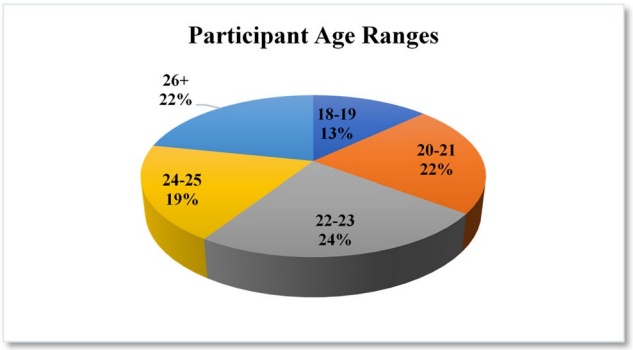


Fig. 2 Participant age ranges

Findings

Descriptive Statistics

The first series of prompts presented to the participants focused on demographic and experiential groupings. For example, of the 200 participants, 56.1% were female and the remaining 43.9% identified as male. The age range distribution is visualised in Fig. 2. Due to the youth of the students, a relatively equitable distribution was observed. In terms of GPA, 60.1% of the sample population reported scores over 3.1, suggesting a relatively high performing sample population. The degree-level distribution was also diverse, with participants in all five of the disciplines, and English (21.7%) and Mathematics (21.7%) with the highest representation amongst this sample.

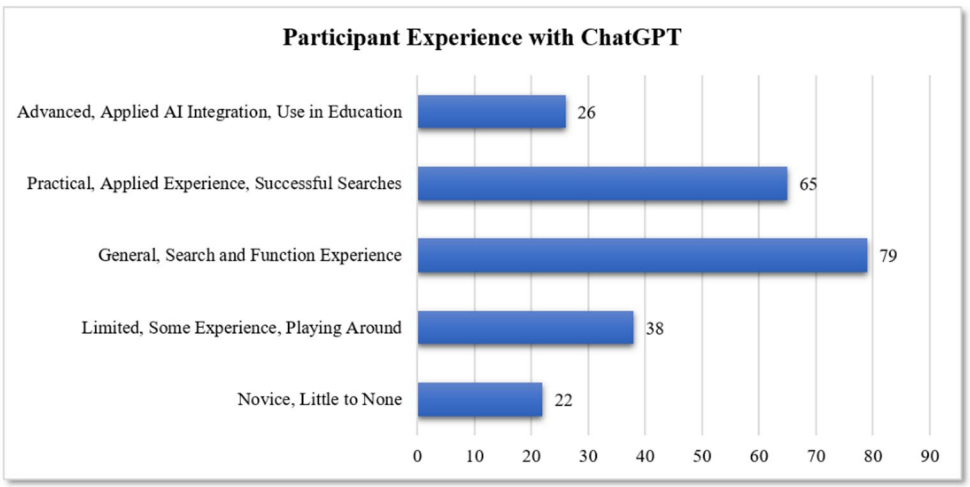
The participant experience with ChatGPT visualised in Fig. 3 highlights 39.5% of the combined sample with practical or advanced experience. In fact, just 9.5% of the sample reported novice level experience. The mean score for students in this dimension was 3.18. This finding indicated that within group, the general experience level was average, a finding that suggests slow or measured adoption of ChatGPT technologies.

The first series of prompts focused on the perceived opportunities associated with ChatGPT (See Fig. 4). As visualised in this model, the results were distributed across all five perspectives, with some prompts triggering a more rigorous response. For example, 51.7% of the sample disagreed that chatbot writing was a form of personal agency. ANOVA comparison of means tests (See Appendix A) revealed statistically significant effects across all of the independent variables (Gender, Age, Major, Status, Experience). When crosstabular analysis was applied, individuals in the English major were more likely to support chatbot essay writing as a means of personal agency, whilst individuals in medicine and mathematics overwhelmingly rejected such positions. Male participants were more likely to support chatbot applications than their female counterparts, as were younger participants.

For the ethical concerns surrounding chatbot technologies, although only 19.6% of the participants agreed (only students) that it is not plagiarism if you rewrite chatbot ideas in your own words. These finding suggests a flexibility in ethical conditions that may threaten consistency in university control. Further, 19.5% rejected the claim that students who cheat using AI chatbots should not receive the same degrees as those who do not, suggesting an ethical conflict for some students. Only 23% of the sample disagreed that AI as a resource could lead to negative impacts on the educational system, framing a perspective that without interventions, impacts would be likely in the future, such as a higher rate of academic dishonesty, student exploitation, or a shift in university pedagogy.

As for technological resources underlying ChatGPT and their advantages in educational settings, 57.4% of the sample agree that ChatGPT offers a valuable extension of AI capabilities for intuitive search functions in academic settings. Despite such advantages, only 21.7% of the sample rejected the claim that dependency would reduce students' ability to actively search for information on their own. ANOVA

Fig. 3 Participant Experience with ChatGPT



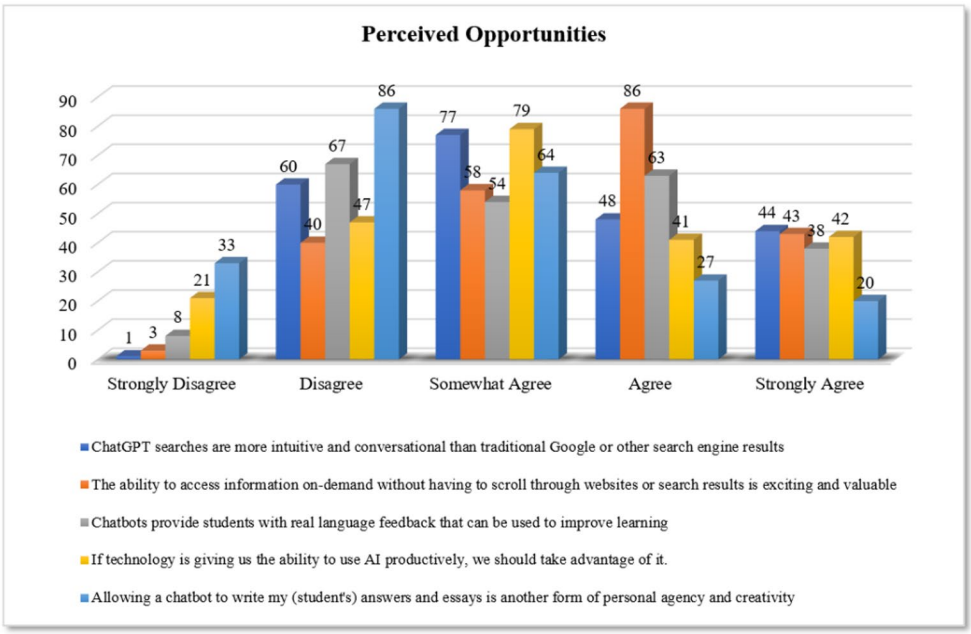


Fig. 4 Perceived opportunities

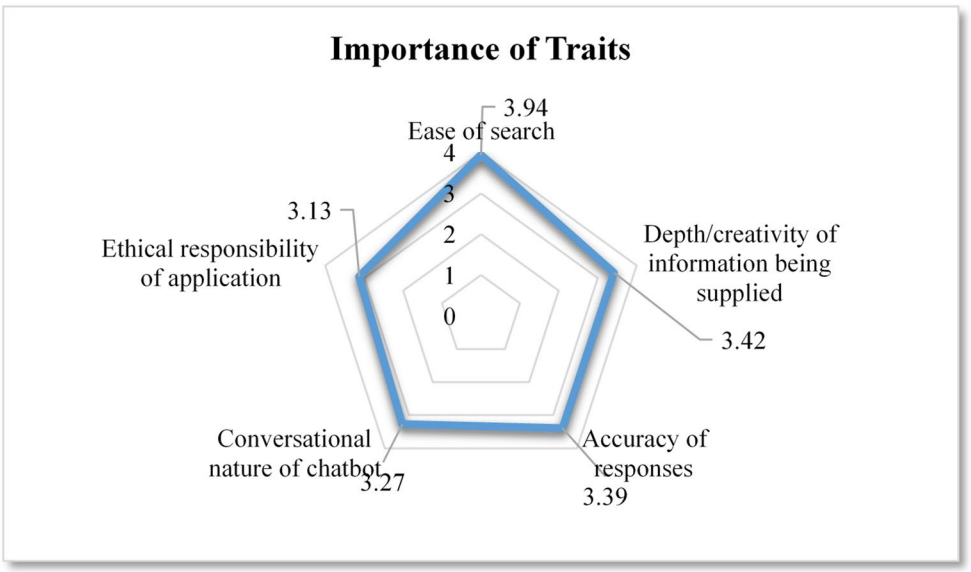


Fig. 5 Importance of traits

findings confirmed that dependency effects were magnified by gender (higher in men), age range (higher in younger participants), GPA (higher for those with lower GPA), and major (English majors most likely to reject dependency). 84% of the sample at least somewhat agree that university administrators will need some AI technological support to counteract the proliferation of ChatGPT.

Regarding the motivational factors evaluated by these participants ranked by effect, suggesting that grades and scoring are the least motivational forces, whilst peer contagion and topical assistance are the most motivational forces. In fact, with a lower standard deviation and a high level of consensus, peer influence was perhaps the strongest motivational force reported by the respondents. 86.9% of the sample indicated that peer influences were at least somewhat motivational. In contrast, just 77.5% of the sample agreed that a very difficult topic was at least a somewhat motivational force in using ChatGPT.

In response to the final prompts, students completed ranked traits on their perceived importance (See Fig. 5). The weighted feedback indicated that the ease of search (3.94) was the most important, whilst depth of information being supplied (3.42) was secondary. Ethical responsibility was rated the lowest (3.13) out of all five traits; however, it still remained in the somewhat important range.

Table 1 Moderation results for H2a

Predictor	β	SE	t	*p*
Opportunities	0.47	0.06	7.83	<0.001
Social Contagion	0.32	0.08	3.96	<0.001
Interaction (Opp. & SC)	0.18	0.07	2.46	0.015

Table 2 Moderation results for H2b

Predictor	β	SE	t	*p*
Limitations	–0.39	0.07	–5.57	<0.001
Social contagion	0.32	0.08	3.96	<0.001
Interaction (Lim. & SC)	–0.07	0.06	–1.17	0.024

Table 3 Moderation results for H3

Path	β	*p*	95% CI
Contagion → Ethics	0.36	<0.001	[0.19, 0.52]
Ethics → Integration	0.42	<0.001	[0.24, 0.61]
Indirect (Contagion → Ethics → Integration)	0.15	–	[0.07, 0.27]

Hypotheses Testing

H1a: Perceptions of Opportunities Afforded by AI Chatbots Positively Influence Practical Integration

The first hypothesis explores whether perceived opportunities conferred by the use of AI chatbots (specifically, ChatGPT) positively influences practical integration in academic practice. Opportunities were conceived of as involving benefits such as supporting research, generating ideas or content, and accessibility, whereas Practical Integration refers to self-reported usage practices in academic and educational practice (e.g., using AI to research in practice).

The normality and distribution of the variables (skewness = < ±1) prompted analysis using a simple linear regression, which indicated a positive relationship that was statistically significant ($\beta = 0.54$, $t = 9.12$, $p < 0.001$). This accounted for an estimated 29% of variance in Practical Integration ($R^2 = 0.29$). These results uphold the H1a, indicating that students who perceive greater educational benefits from using ChatGPT are more likely to use AI chatbots in their studies.

H1b: Perceptions of Limitations of AI Chatbot Technologies Will Negative Influence Practical Integration

H1b tested whether student perceptions of AI's limitations—such as its inaccuracy and bias – negatively influenced Practical Integration. The Limitations construct was regressed on Practical Integration according to Cronbach's alpha ($\alpha = 0.81$), indicating good internal consistency across this construct. A negative linear regression was found that accounted for some 17% of the observed variance ($\beta = -0.41$, $t = -6.84$, $p < 0.001$, $R^2 = 0.17$). This, again, supported the hypothesis, implying that students who perceive chatbots as having *more* limitations integrated them less into their academic practices.

H2a: the Influence of Peers, Communities and Social Media (Social Contagion) Moderates the Relationship between Opportunities and Practical Integration

Social Contagion, comprised of peer and social media influence, was hypothesized as moderating the positive effect of opportunities upon integration. Hayes' PROCESS Model 1 was employed, with Opportunities entered as the predictor and Practical Integration as outcome. The results reviewed in Table 1 indicate a significant interaction when Social Contagion is placed as the moderator. A slope analysis revealed that when Social Contagion is higher (i.e., +1 SD), the relationship between Opportunities and Practical Integration is *stronger* ($\beta = 0.67$, $p < 0.001$) as compared to when Contagion is low ($\beta = 0.41$, $p < 0.01$). Thus, social and peer influences appear to collectively amplify positive adoption behaviours insofar as they are influenced by positive perceptions of AI.

H2b: the Influence of Peers, Communities and Social Media (Social Contagion) Moderates the Relationship between Limitations and Practical Integration

The second part of the second hypothesis focused on the moderating role of social influences when it comes to perceived *limitations* of AI and its practical integration into students' academic practice. The PROCESS Model 1 analysis was repeated, this time positioning Limitations as the moderator (Table 2). Here, the influence of Limitations on Practical Integration was confirmed ($\beta = -0.39$, $t = -5.57$, $p < 0.001$), though the observed interaction with Social Contagion was small and not statistically significant. This is perhaps surprising given that Social Contagion by itself appears to be positively correlated with Practical Integration and mediates positive views of AI's opportunities with respect to education.

H3: Ethical Awareness Mediates the Relationship between Social Contagion and Practical Integration, with Stronger Ethical Values Correlating with More Constructive Integration

H3 hypothesises that ethical awareness mediates the relationship between social influences and integration of AI technology into academic practice. The indirect path was tested through bootstrapping, this time using PROCESS Model 4 (Table 3). Social Contagion was found to positively predict Ethics, whilst Ethics were found to positively predict Practical Integration. The proportion of the indirect effect was

significant, indicating that the effect of Social Contagions upon Practical Integration is at least partially mediated by ethical awareness. Given the construction of Practical Integration on the basis of *constructive* and *responsible* chatbot integration, the influence of ethical awareness appears to promote 'ethical' integration of AI into academic practice.

H4a: Awareness of University Policy Positively Influences Ethical Awareness

Hypothesis 4a tests whether students' awareness of university policy can impact AI use. Measure of Policy was derived from accurate awareness of disclosure requirements, plagiarism definitions, etc., cross-referenced against actual institutional policies in each case (distinct for each university). From this, a score was developed that reflected the percentage of policies which participants correctly identified. Data from 47 participants drawn from three universities were excluded as their institutions' AI usage policies were either not available or not sufficiently developed to test. As both variables are continuous and met assumptions of normality, a simple linear regression was used, generating a significant positive relationship that accounted for 24% of variance in ethical awareness ($\beta = 0.49$, $t = 8.33$, $p < 0.001$, $R^2 = 0.24$). On this basis, H4a was supported, finding that students who were more familiar with their institution's policies on AI had more awareness of the ethical issues surrounding AI usage in education.

H4b: Perception of AI Detection Mechanisms as Effective Strengthens the Relationship between Ethical Awareness and Practical Integration

The effect of student perceptions of AI detection effectiveness upon the relationship between ethical awareness and responsible integration of AI into academic work was tested using PROCESS Model 1 (Table 4). Importantly, this did not take into account actual effectiveness but student *perceptions* of detection accuracy at their institution. A significant interaction effect was noted, with the relationship between Ethics and Practical Integration being *higher* when students perceived higher AI detection accuracy on behalf of their institution. This supports the hypothesis that ethical awareness will more often translate into responsible AI use when students perceive the risk of detection for illicit AI use as substantial.

Table 4 Moderation results for H4b

Predictor	β	SE	t	*p*
Ethical awareness	0.44	0.07	6.29	<0.001
Detection effectiveness	0.29	0.08	3.63	<0.001
Interaction (ethics × detection)	0.16	0.07	2.33	0.021

Table 5 Moderation results for H5

Predictor	β	SE	t	*p*
Ethical awareness	0.38	0.06	6.03	<0.001
Student integrity	0.31	0.07	4.43	<0.001
Interaction (ethics × integrity)	0.22	0.08	2.92	0.004

H5: Student Integrity Positively Influences the Relationship between Ethical Awareness and Practical Integration, Leading To More Legitimate Usage of AI Technology

The fifth hypothesis tests whether student integrity—defined in terms of commitment to original content, high academic standards, and honesty in academic conduct—moderated the links between Ethics and Practical Integration. This recognizes the potential for students to adhere to or ignore their ethics, or otherwise have strong ethical motivations in spite of little awareness of ethical awareness pertaining specifically to AI use. Moderation analysis suggests that there is a strong and significant interaction between Integrity and Practical Integration ($\beta = 0.22$, $p = 0.004$). Furthermore, its moderating effect on the influence of ethical awareness upon AI use was stronger at higher levels of integrity ($\beta = 0.64$, $p < 0.001$) versus lower levels ($\beta = 0.27$, $p = 0.045$) (see Table 5).

H6a: GPA Negatively Moderates Relationships between Opportunities and Practical Integration

Examining the effects of GPA on academic performance necessitated grouping students based on their reported score. Descriptive statistics showed that roughly three-quarters of students reported GPAs between 3.6 and 3.5, whilst the remaining quarter reported GPAs above 3.5. A preliminary ANOVA comparison of means suggested that perception of Opportunities differed according to GPA level, noting a statistically significant group effect ($F(1,198) = 7.84$, $p < 0.001$). Students with lower GPA scores reported higher positivity towards ChatGPT use in general ($M = 4.18$, $SD = 0.62$) when compared with students who had higher GPAs ($M = 3.54$, $SD = 0.73$).

Cross-tabular analysis corroborated this finding. A fifth of respondents who had GPAs under 3.5 strongly agreed that student prompts resulting in ChatGPT content designed for submission reflected sufficient involvement of student agency in the drafting process. The same evaluation was true of only 2.5% of students with a GPA above 3.5. Across

individual questions, the cohort reflecting lower GPA scores appeared more open to illicit use of ChatGPT in academic practice by a considerable margin. This suggests that Practical Integration—reflecting responsible use of AI in academic practice – should be higher among students with higher GPAs.

The moderating relationship of GPA upon Opportunities and Practical Integration was tested using hierarchical regression analysis (Table 6). GPA was found to have a negative main effect and likewise a negative indirect effect on the relationship between Opportunities and Practical Integration. This supports H6a, finding that whilst students generally view AI chatbots positively, this effect drops off as GPA rises. Students with higher GPAs may be more discerning regarding their AI usage and more inclined to utilise AI in an ethical and responsible fashion.

Table 6 Moderation results for H6a

Predictor	β	SE	t	*p*
Opportunities	0.47	0.06	7.83	<0.001
GPA	–0.26	0.09	–2.84	0.005
Interaction (Opp × GPA)	–0.19	0.08	–2.52	0.013

Summary

The results reflect a representative student sample with high average GPAs reflective of the quality of institutions from which the participants were drawn. Perceptions of the opportunities conferred by ChatGPT were largely positive, especially among younger, male students, though less so among students were higher GPAs. There was notable ethical disagreement among the cohort, with a substantial minority of students finding little moral fault with submitting AI-generated content for assessment.

Statistical analysis supported most of the study's hypotheses. Perceived opportunities for using AI in education were a strong positive predictor of Practical Integration, whilst perceived limitations had a negative effect on their incorporation. Social pressures amplified the effects of opportunities but not of limitations, suggesting that peer and community influences tend to emphasise the positive aspects of AI, encouraging its uptake in a positive manner. Ethical awareness also boosts Practical Integration, with student integrity, awareness of university policy, and perception of the institution as being able to detect illicit use amplifying this relationship between ethics and responsible AI use. Interestingly, GPA *negatively* moderated opportunity effects, suggesting that lower-performing students were less discerning about how they employed ChatGPT in their academic practice.

Discussion and Analysis

The above results highlight some of the potential mechanisms influencing chatbot use in academic practice as modelled in Fig. 1. From the intersection of personal and institutional ethics to learning assistance and student support, the ambiguity surrounding AI deployment for educational purposes as noted in the literature review raises questions about the possible threat to the integrity of existing systems and standards. The following sections will discuss these findings, drawing upon prior research and core theories to propose a model for university adoption that is able to weight the perceived advantages of chatbot learner support against ethical responsibility and institutional integrity.

Modelling Student Behaviour

The corroboration of this study's model in accordance with statistical testing demonstrates how student behaviours can be mediated by a number of perceptions and attitudes. Academic performance, ethical awareness, and peer socialisation all play a role in this regard, aligning with the core tenets of the Technology Acceptance Model and its position that perceived usefulness and ease of use motivate technology adoption [27]. Students who recognise the benefits of AI are more likely to adopt it and to do so in a positive fashion as compared with students who perceive limitations to the technology.

The moderating roles of factors such as peer influence reflect the importance of academic socialization when it comes to how technology is adopted and employed [10]. Norms within peer groups can reinforce either constructive or permissive attitudes towards chatbot use in education, though it is notable that only perceived opportunities were mediated by these effects, and in a positive direction. Why this is the case is not entirely clear, but is nevertheless aligns with a socio-cultural approach to learning, as opposed to rooting student behaviour wholly in cognition of technology and its practical affordances. The same may be said of social factors moderating the influence of ethics upon integration, highlighting also the institutional dimension of academic socialization. This advertises the possibility for universities to significantly influence student behaviours, even when peer attitudes and associated norms lie outside their reach.

Student Risks and Behaviour Shifting

One of the key findings reported by the participants in this study is that the likelihood of illicit chatbot usage is decreased significantly in proportion to the likelihood of inaccurate or detectable responses. Whilst an array of inaccuracies and inconsistencies have been observed in

ChatGPT outputs, [14] argue that social media discussions and online user generated publicity have increased the popularity of such applications amongst university student populations. In industries like law and medical studies where the academic rigour of knowledge gathering and interpretation is significant, the attractiveness of chatbots is magnified by their potential improvement of student performance [15, 28]. This is arguably reflected in the increased likelihood of students with lower GPAs approving of using ChatGPT in an illicit fashion.

There was a general sense of flexibility or acceptance in some of the responses offered by these Hong Kong students; however, such perspectives were only related to the application of chatbots as general technological solutions, not targeted teaching aides or essay writing assistants. Pophal [30] highlights the range of ethical problems associated with student usage of chatbot solutions for academic coursework, proposing that policy initiatives and interventions must be unified to mitigate the probability of student pitfalls. Despite the potential attraction of chatbot essay writing or coursework assistance, [31] reminds that students have had access to a variety of online cheating and assistance services such as essay mills for decades, a decision that is ultimately made on the basis of personal ethics and value systems which may be sufficient to avoid a pay-for-grade type of pitfall. The need for integrity to frame cultural embeddedness within the university system is critical to allowing administrators to provide students with a degree of trust and flexibility without resulting in a broader range of ethical hurdles.

Whereas students may fear the consequences, both ethical and academic associated with chatbot dependency, [13] argue that the attractiveness of a native speech, adaptive, and responsive analytical system like ChatGPT is likely to extend beyond simple cheating or a copy-paste approach to academia. Instead, there is a collaborative opportunity at various levels of modern education to utilise AI tools to advance human knowledge and accelerate the rate of technological innovation, particularly as rote or complex tasks are eliminated from the day-to-day procedures for aspiring creatives and future entrepreneurs or innovators [13]. The feedback from the students in the current study suggests that direct utilisation of AI-generated content is frowned upon by the vast majority of students; however, supportive guidance and knowledge seeking behaviour may support future learning outcomes.

Policy Commitments and University Interventions

As demonstrated by the rigorous rules adopted by the 40th International Conference on Machine Learning in [9] argues that academic institutions including journals, universities, and think tanks must take a rigid stance against AI submissions. Although the evidence suggests that it may be difficult for human auditors to detect AI contributions, the policy position itself serves as a form of deterrent, threatening violators with an array of penalties and consequences that could lead to a loss of status or position [9]. The results of this study note that the perceived likelihood of being 'caught' using AI in an illicit fashion appears to be correlated with positive AI use. To strengthen this effect, content checkers and AI pattern recognition software could viably replace the deficiencies of human assessment; however, the innovativeness and natural semantic proficiencies of advanced services like ChatGTP make detection difficult and attribution even more challenging [13] Pophal [29]. These are challenges that apply at a global level across education and reflect one of the primary issues surrounding the growth of chatbot technology.

For Hong Kong universities, the zero tolerance policy surrounding ChatGPT is potentially problematic when comparing the evolutionary character of search engines (e.g. Bing using ChatGPT) and student research behaviour [38]. Whereas [36] reports that organisations like Open AI are seeking to integrate cryptographic watermarks into ChatGPT evidence, student paraphrasing or replication or even integration strategies can be used to minimise unethical academic behaviour, whilst simultaneously benefitting from AI content. In a critical review of AI chatbot performance, [22] observed that common software suites like Turnit-in failed to identify the patterning of AI-enabled plagiarism despite the potential reverse-engineering of the ChatGPT bot itself. Detection software and capabilities are an important antecedent to enforcement which must become an embedded condition of institutional analytics, particularly as students evolve their own ethical values and perceptions of plagiarism away from chatbot assistance.

There was an expectation amongst the students the study that chatbot information should be accurate and reliable, conditions that prior research has shown to be inconsistent as these technologies evolve. The potential for incorrect or inaccurate information from chatbot outputs, for example, not only threatens student learning, but raises concerns about the compendium of academic research and evidence that forms the basis for the reference materials sourced as training materials [36]. In fact, [31] observes that in many cases, the use of chatbot technologies will out or identify student plagiarism because of various inaccuracies or mistakes, many of which are due to the trained nature of the AI itself. Similarly, [25] revealed that chatbot inaccuracies are often easy to detect by comparing core concepts or prior academic research with the presented outputs, thereby allowing analysts to identify inconsistencies or mistakes in the findings and writeup. By adopting a formal system for

weighting the accuracy of student responses in online test-taking and essay-writing, [32] proposes that universities can systematically identify student violators. The problem in proving such actions, however, is that student defence in remote or online coursework is often linked to self-adjudication, a position that forces universities to prove cheating or face claims of discrimination and unfairness.

Limitations

The field of research surrounding chatbot applications in university settings is growing exponentially as researchers recognise the important of open discussion and experimentation. In Hong Kong, a critical discourse has emerged relative to the potential pitfalls and risk factors affecting academic integrity as students explore the proposition of chatbot applications. Therefore, this study has focused on generating a baseline representation of student and teacher perspectives that can be used to initiate a discussion in future analysis. For this reason, the sample populations were limited in size and restricted to current students and educators within the Hong Kong University system. Future research can consider the experiences of other institutions or weigh particular experiments such as AI-supported classwork and experimentation. Further, the range of prompts in this instrument was limited by the feasibility of the survey itself and the likelihood of participation. Therefore, additional instruments can be used to refine the contrast between incoming and outgoing student experiences with chatbot technologies. A final consideration is the prospect for response bias given that students may have under-reported unethical AI use or over-reported responsible integration into practice. Future research can emphasise the anonymous nature of the research, perhaps through arriving at a more anonymised data collection procedure that takes advantage of anonymity features included in some online questionnaire instruments.

Conclusions

For Hong Kong universities, the rapid dissemination of AI chatbot applications and web services across student bodies has resulted in the immediate need for policy framing and rule-making. Whereas the academic advantages of guided search capabilities may provide a general justification for chatbot popularity, the subversive consequences of AI papers and test taking has direct implications for the integrity and reliability of the institutional system itself. Despite such possible threats to the efficacy and honesty of student submissions, evidence from recent studies reveals that many university attendees have experimented with chatbot services to complete academic work or formal course submissions.

As a classic case of could-but-should rationalisation, chatbot users are confronted with an array of ethical hurdles, particularly when integrating these technologies into high-scrutiny systems like education. The literature and prior empirical findings suggest that the tension between ethical accountability and technological dependency is significant, framing student intentions regarding chatbot applications and potentially compelling universities towards tactical interventions. In Hong Kong, administrators have decidedly acted to eliminate any debate surrounding the fair use applications of chatbot technologies, imposing severe consequences upon students who elect to cheat or violate their academic integrity by deploying these technologies for personal gain.

Given the tension between innovative opportunities and academic integrity, it was critically important for this study to introduce a comparative perspective of those inside stakeholders who will be most affected by any policy or administrative changes. Accordingly, the questionnaire was administered to a robust sample from across eight Hong Kong universities. The findings confirmed both of the initial hypotheses which emphasised the motives surrounding chatbot utilisation and academic integrity. Importantly, the quantitative analysis of the evidence confirmed a degree of ethical malleability associated with a range of variables including academic achievement. There was a distinct variation in the feedback from students that indicated a degree of openness on the part of the Hong Kong student body to applying chatbot capabilities to various academic applications.

The ability to distinguish between student work and chatbot outputs is a problem of techno-social innovation. As researchers develop AI-supported analytics that can monitor and identify chatbot text via structural or watermark technologies, the potential for student abuse of these technologies will continue to decline. However, similar to other online resources such as essay mills or cheat websites, students are innovative and tactical in their approach to academic opportunism. Therefore, these findings suggest that the threat of detection is insufficient to discourage all future chatbot usage in academic settings. Instead, Hong Kong universities must focus on developing a culture of academic integrity that prioritises student achievement and self-actualisation over technology-mediated outcomes. Ultimately, this approach will stimulate a social contagion that prioritises integrity over ease of use or technological mediation. Through including discussions regarding student achievement and empowerment in classroom settings, a new standard of self-efficacy and integrity can be infused in the academic blueprint.

As both variables are continuous and met assumptions of normality, a simple linear regression was used, generating a significant positive relationship that accounted for 24% of variance in ethical awareness ($\beta = 0.49$, $t = 8.33$, $p < 0.001$, $R^2 = 0.24$). On this basis, H4a was supported, finding that students who were more familiar with their institution's policies on AI had more awareness of the ethical issues surrounding AI usage in education.

Appendix

ANOVA	Status		Gender		Age Range		GPA		Major	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.
ChatGPT searches are more intuitive and conversational than traditional Google or other search engine results	0.627	0.429	6.590	0.011	12.882	0.000	5.497	0.001	5.469	0.000
The ability to access information on-demand without having to scroll through websites or search results is exciting and valuable	16.223	0.000	0.901	0.344	4.168	0.003	3.410	0.019	4.834	0.001
Chatbots provide students with real language feedback that can be used to improve learning	1.162	0.282	0.156	0.693	4.275	0.002	3.747	0.012	1.804	0.129
If technology is giving us the ability to use AI productively, we should take advantage of it.	5.011	0.026	14.080	0.000	3.068	0.017	0.572	0.634	5.628	0.000
Allowing a chatbot to write my (student's) answers and essays is another form of personal agency and creativity	11.170	0.001	17.385	0.000	6.195	0.000	11.389	0.000	17.355	0.000
Achieving higher marks through AI support is unethical and should be banned	5.699	0.018	9.309	0.003	11.202	0.000	1.361	0.256	7.246	0.000
Students who cheat using AI chatbots do not deserve to earn the same degrees as those who do not.	8.468	0.004	0.020	0.888	2.983	0.020	7.326	0.000	5.632	0.000
As long as you are supporting your pursuit of knowledge, AI chatbots should be allowed.	17.619	0.000	5.986	0.015	6.822	0.000	1.458	0.227	7.131	0.000
It is not plagiarism if you rewrite the same ideas that ChatGPT generates into your own words	4.792	0.030	45.634	0.000	10.094	0.000	9.886	0.000	4.631	0.001
If AI is allowed as a resource, then the potential for abuse is likely to negatively impact the educational system	0.948	0.331	13.661	0.000	4.718	0.001	10.317	0.000	16.031	0.000
ChatGPT offers a valuable extension of AI capabilities for more intuitive search functions	0.002	0.965	7.724	0.006	7.366	0.000	3.946	0.009	3.294	0.012
Dependency upon technology like ChatGPT will reduce my ability to search out and analyse information for myself.	7.650	0.006	11.919	0.001	10.447	0.000	7.283	0.000	7.866	0.000
The inaccuracies and language structure used by ChatGPT make it easy to detect for teachers and university administrators	8.704	0.004	21.901	0.000	0.616	0.652	1.822	0.144	4.398	0.002
Student use of technology is just another extension of their identity and should not be penalised.	24.516	0.000	35.829	0.000	15.204	0.000	3.446	0.018	4.820	0.001
To counteract the proliferation of ChatGPT, administrators need AI technologies that can detect their own kind.	0.647	0.422	48.525	0.000	12.033	0.000	3.072	0.029	14.181	0.000

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Declarations

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Consent to participate Informed consent was sought from the participants.

Consent for publication Authors consented the publication. Participants consented to publication as long as confidentiality is observed.

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