Students' Use and Attitudes Toward Generative Artificial Intelligence: A Comparative Study Between the UK and China

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Abstract

Generative Artificial Intelligence (AI) has become a focal point in higher education worldwide. Research has demonstrated its potential to enhance student learning, particularly for those disadvantaged in traditional educational contexts. However, concerns regarding fairness, transparency, and the ethical use of technology underscore the importance of developing evidence-based guidelines and policies for governing generative AI. While global efforts have been made to create policies and support the ethical use of these tools, there remains a lack of data on student usage and attitudes toward generative AI tools to inform such policy-making. Specifically, the absence of cross-national perspectives on student use poses risks of widening the existing digital divide when implementing guidelines established by leading organizations, which often lack the voices of Global South contexts. Our study aims to use a cross-national survey to examine the current practices of GenAI in various national contexts. We are collecting data from several countries. So far, we have collected data from China (Hong Kong and Macau) and the UK and this paper reports the results from two countries. Our findings highlight three main themes comparing students' use and attitudes toward generative AI in learning between the UK and China: types of tools used, students' primary uses of the tools and associated concerns, and students' attitudes toward using the tools. Our results offer valuable insights into student use of generative AI worldwide and conclude with practical recommendations for policymakers and educational practitioners in the field of generative AI in higher education.

Keywords: Generative AI, higher education, Student insights, policy and guidelines

1. Introduction

Generative AI has become a global focal point in higher education since the launch of ChatGPT by OpenAI in 2023, even though students have long used AI tools. Research has already explored various AI tools, including Automated Writing Evaluation (AWE), Automated Writing Corrective Feedback (AWCF), and Automatic Text Generation (ATG) (Ding, Zhao, & Wang, 2024). Specifically, rewriting bots such as Quillbot, Wordtune, and Grammarly have been widely adopted by students, particularly in academic writing contexts (Kurniati & Fithriani, 2022; Zhao, Xu, & Cox, 2024; Zhao, 2023). The release of ChatGPT has accelerated the development of generative AI technologies, prompting major tech companies to compete in launching new AI products or enhancing existing ones with built-in AI features, such as GrammarlyGo, Copilot, and Gemini (Ding & Zou, 2024).

However, the usage figures for general chatbots, such as ChatGPT, currently surpass those of other genAI tools. Students tend to rely more heavily on these chatbots or use them in conjunction with other genAI tools, such as rewriting bots and translation bots (Zhao, Cox, & Cai, 2024). Despite the remarkably rapid rise in popularity of genAI technologies, most studies have primarily focused on institutional, pedagogical, or technical perspectives. These studies often highlight the potential benefits of genAI, such as increasing learning efficiency and boosting student confidence, while also cautioning against potential drawbacks, including breaches of academic integrity, overreliance on AI tools, and the spread of misinformation.

Current research tends to adopt a more top-down approach, often lacking a bottom-up perspective that

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involves gathering data directly from students about their usage patterns and attitudes. Engaging students as partners in the development of policies related to genAI use could provide valuable insights that are currently missing. Moreover, there is a notable scarcity of cross-national studies that explore students' insights and experiences with genAI, which could be crucial for shaping comprehensive global policies and guidelines. This gap highlights the need for a more inclusive approach that considers diverse student experiences across different cultural and educational contexts to better support equitable and effective use of genAI technologies worldwide.

2. Literature review

2.1 Generative AI in Higher Education Around the World

Research on generative AI in higher education has highlighted its benefits in assisting student self-directed learning, enhancing subject knowledge, and aiding with academic tasks such as brainstorming ideas, paraphrasing and editing text, structuring writing, and programming (Zhao, Cox, & Cai, 2024). These advantages could potentially improve student learning outcomes, increase employability, and level the playing field for traditionally disadvantaged groups, including international students facing language barriers and disabled students (Zhao et al., 2024).

However, concerns arise regarding the widespread and unregulated use of these tools, such as potential breaches of academic integrity, the automation of thinking, inaccuracies and hallucinations, biases, overreliance on technology, and reduced learning opportunities (Zhao, Cox, & Cai, 2024). Despite the rapid growth in research on generative AI, regulation and governance of these technologies often lag behind their development.

Furthermore, there is a significant gap in understanding how such technologies might widen the digital divide, particularly for regions with restricted access to these tools. There is also a lack of cross-national examination of the differences in usage and attitudes towards generative AI, especially within various national and institutional policy contexts.

Efforts have been made to establish cross-national guidelines and frameworks to support educational institutions in adopting and training students in the ethical use of generative AI tools. Notable examples include UNESCO's guidelines for regenerative AI in education and research (Holmes & Miao, 2023) and the European Commission's guide on the responsible use of generative AI (2024). However, key stakeholders such as university managers, teachers, and students remain uncertain due to the inconsistent and unclear policies. For instance, the Russell Group, an organization of 24 leading research universities in the UK, shifted from banning generative AI technology to welcoming its ethical use within four months (Russell Group, 2023). This rapid change highlights the ongoing debates among staff members at universities worldwide. Opinions are divided between conservative views advocating for a complete ban on AI-related tools and those promoting the ethical use of generative AI in teaching and learning processes. This division is also evident among students. Some students fear using these tools due to potential breaches of academic integrity, while others leverage them to enhance various aspects of their learning process (Zhao et al., 2024). The disparity in views reflects the broader challenges and uncertainties that higher education institutions face as they navigate the integration of generative AI into their academic environments.

2.2 Current Gaps in GenAI Research

Numerous studies on generative AI have been guided by socio-technical perspectives. However, much of this research focuses on applying the technologies themselves, such as prompt engineering, accuracy issues, and the ethical use of these tools in learning and teaching. There is comparatively less emphasis on the broader social impacts, including sustainability, labor exploitation, and the right to education (Al-Sharafi et al., 2023; Zhao, Cox, & Cai, 2024).

Furthermore, existing research on generative AI in education primarily focuses on Western contexts and also neglects vulnerable groups who are disadvantaged in traditional learning environments, such as international students and disabled students (Bannister et al., 2024; Zhao et al., 2024). While policies such as UNESCO's AI guidelines are widely followed in Western contexts, there is a significant lack of research and policy development in non-western contexts, particularly in developing countries and regions where the use of GenAI is still restricted or banned, such as China (Wang, 2023).

The fairness framework for AI, primarily developed by Western scholars, may inadvertently widen inequality by excluding perspectives and involvement from non-Western contexts, such as the voices of Global South contexts. These frameworks face challenges when localizing policies without considering the unique sociopolitical contexts and cultural differences of these regions. We argue that it is crucial to involve a diverse range of stakeholders in the development and implementation of AI policies to ensure that they are equitable and effective globally. Therefore, we aim to conduct a cross-national study

comparing the use and attitudes toward generative AI among students in various countries, including China, the USA, the UK, Italy, and Sweden, Mexico, Jordan, Saudi Arabia. At the time of writing this paper, we have completed data collection and analysis for two contexts: the UK and China (Hong Kong and Macao). Therefore, this paper primarily focuses on comparing these two contexts, with plans for further analysis involving more Global South contexts in the near future.

3. Methodology

We designed a cross-national survey to explore students' usage and attitudes towards generative AI in their learning processes. Data for this study were collected from university students in China (Hong Kong and Macau) between March and April 2024, and in the UK between February and March 2024. The survey was initially designed in English and translated into Chinese for distribution to students in China to mitigate language barriers. The survey was sent to a group of staff to invite feedback and was piloted with student representatives at a British university. The Chinese translation was cross-checked by two native Chinese speakers who are fluent in English to validate the questions.

In the UK, students have full access to a wide range of generative AI tools. In contrast, students in China face restrictions on using these tools. Despite this, universities in China have provided some access, and students are using third-party software to access generative AI tools.

To facilitate comparison, both the UK and Chinese surveys included same questions and were structured into three sections:

(1) The first section contained closed questions to collect demographic information about the respondents, including gender, level of study, subject area, language proficiency, and digital competence.

(2) The second section focused on the range of GenAI tools students used and their attitudes towards these tools, incorporating both closed and open questions, such as the frequency of using common generative AI tools (e.g., ChatGPT, Gemini, Bing Chat, GrammarlyGo).

(3) The third section investigated students' real-life usage of GenAI tools, also consisting of both closed and open questions, such as "How do you use generative AI tools?", "Monthly cost of subscription to all generative AI tools", "Perceived risk for using generative AI tools", and "Do you have any suggestions for how to adopt genAI in higher education effectively?".

Notably, there were minor revisions to the Chinese version of the survey. Due to the restricted access to some generative AI tools, a few tools were omitted, and some local tools were added (e.g., ERNIE Bot, WPS AI). The focus also shifted to exploring students' use of GenAI tools with different functions. The open questions sought students' attitudes on the value of generative AI tools and their suggestions on how to ensure these tools are effectively adopted in learning.

Descriptive analysis was employed to analyse the closed questions, and thematic analysis was used to interpret the open-ended responses.

4. Results

We collected 208 responses from China (Hong Kong and Macau) and 241 responses from the UK. Table 1 displays the demographic information of our respondents.

Table 1 Demographic Information

Characteristic		China	UK
Sex	Female	161	130
	Male	43	86
	Other	4	22
Academic Level	Undergraduate	195	156
	Postgraduate	13	85
Major	Humanity	193	24
	Science & Engineering	2	128
	Social Science	12	80
	Others	1	9

A detailed exploration of the collected data revealed three core themes concerning Chinese and UK students' use of generative AI tools. These themes were:

- Types of generative AI tools students used;
- How students use the generative AI tools and the associated concerns;
- Students' attitudes towards using generative AI tools.

In the following sections, we will discuss the results around these three main themes, comparing the differences and similarities between students in China and the UK.

4.1 Types of generative AI tools used

Our data shows significant differences between Chinese and UK students in the types of generative AI tools they use. Overall, UK students primarily use mainstream tools like ChatGPT, whereas Chinese students rarely rely on these mainstream tools.

This difference is evident from the statistic that over a quarter of Chinese students (n=53) indicated they have never used ChatGPT, resulting in a mean score of 2.36[1] for the question – How frequently do you use ChatGPT. In contrast, UK students had a mean score of 2.73 for the same question, with nearly 10% of them considering it a routine assistant and using it in every step of their learning process (n=22).

A similar situation was also identified with GrammarlyGo. For the UK students, it was the second most frequently adopted generative AI tool (mean score=1.65), whereas it was rarely used by Chinese students (mean score=1.24). Worse still, 77.9% of Chinese respondents (n=185) had never used it.

Chinese students' infrequent use of global mainstream tools becomes more apparent when compared to their use of local tools. Notably, locally developed chatbots, such as ERNIE Bot, had a mean score of 2.56, which is 0.2 higher than ChatGPT. Also, local proofreading tools like WPS AI received higher mean scores than GrammarlyGo, reaching 2.26, with 16.8% of Chinese students considering these proofreading tools as routine learning assistants (n=35).

The primary reason for the differing frequencies of mainstream tool usage between Chinese and UK students is their varying levels of accessibility. In China, mainstream tools are notably restricted by national regulations (Cheng, 2024). This restriction makes Chinese students rely more heavily on locally developed generative AI tools, which lack global recognition. Locally developed generative AI tools, which offer various functionalities to support student learning, should receive attention comparable to mainstream tools. There is already a noticeable lack of trust in technologies originating from Western contexts when applied to other regions. This mistrust, stemming from unfamiliarity with the tools and concerns over ethical breaches, can lead to digital exclusion and limit the effective adoption of new technologies developed in non-Western contexts. Therefore, international collaborations are needed for the development and innovation of these tools, making them more transparent and comparable across contexts. Next, by examining students' interactions with these local tools, educators and policymakers can better understand students' needs and concerns regarding generative AI tools. This insight can then inform more effective guidelines for the ethical adoption of genAI in education, fostering a more inclusive and equitable learning environment globally.

4.2 How students use the generative AI tools and the associated concerns

According to our data, Chinese and UK students shared similar usage patterns and concerns regarding generative AI tools. Notably, both groups adopted generative AI tools throughout the learning process but did not rely heavily on them. More specifically, students used these generative AI tools only occasionally, as shown by the mean scores for the question "How do you use generative AI for learning?" in Table 2 and Table 3.

Table 2. Main uses of genAI tools (China)[2]

Statement	Mean
I use genAI for translating learning materials.	2.85
I use genAI to find relevant information.	2.75
I use genAI for structuring personal ideas.	2.30
I use genAI for proofreading a draft.	2.19
I use genAI for brainstorming ideas.	2.12
I use genAI for summarising learning material.	1.95
I use genAI to interpret an assessment brief.	1.87
I use genAI to validate a draft against assessment criteria.	1.83
I use genAI tools to refine the content of a draft.	1.76
I use genAI tools to overcome a mental block.	1.75

Table 3. Main uses of genAI tools (UK)

Statement	Mean
I use genAI tools to overcome a mental block.	2.20
I use genAI for brainstorming ideas.	2.09
I use genAI tools to refine the content of a draft.	2.02
I use genAI for structuring personal ideas.	2.01
I use genAI for proofreading a draft.	2.01
I use genAI to find relevant information.	1.95
I use genAI for summarising learning material.	1.88
I use genAI for translating learning materials.	1.72
I use genAI to interpret an assessment brief.	1.69
I use genAI to validate a draft against assessment criteria.	1.48

Additionally, for both Chinese and UK students, their occasional use of generative AI tools was primarily aimed at enhancing learning efficiency by allowing these tools to handle tasks, such as information seeking, rather than using them to automate the assignment writing process to improve their grades (see Table 4).

Table 4. Main purpose of using genAI tools

Statement	Mean	
	China	UK
I use genAI to improve my learning efficiency.	3.66	3.39
I use genAI to improve my grades in learning.	3.07	2.78

[1] We employed a 5-point Likert scale to capture respondents' views on the statements above, ranking from never use=1 to always use =5

[2] We employed a 5-point Likert scale to capture respondents' views on the statements listed in Table 2, 3 and 4, ranking from never use =1 to always use =5

By analysing their answers to the open question – What are your perceptions and concerns about adopting ngenerative AI tools in learning, we can identify why both groups only use genAI tools occasionally and mainly for enhancing learning efficiency. The main reasons were twofold: students' concerns about the quality of the genAI's support and their commitment to academic integrity.

Specifically, students felt that support provided by genAI tools were "*too simple*" and "*clumsy*", and are detached from their learning context and unable to address their learning needs. As a result, when applying genAI tools to guide their writing and thinking, students could only get works that "*lacks innovation and criticality*", ultimately failing to meet the assessment criteria set by the university.

Worse still, the low-quality work generated by genAI tools also lacks academic integrity, as it may contain content that "*directly plagiarises existing online material*".

Recognising these shared use patterns and concerns provides valuable insights for developing guidelines to better integrate genAI in a global learning context – these guidelines will be detailed in the Discussion section.

4.3 Eager but unsure on how to use genAI effectively

Our data revealed that respondents are eager to use genAI but are unsure how to do so effectively. Overall, they have a positive attitude towards genAI and support its integration into higher education (mean=3.80 in China and mean=4.00 in UK) [3]. Specifically, both groups are interested in incorporating genAI into their learning (mean=3.66 in China and mean=3.39 in the UK) and supporting its future developments (mean=3.56 in China and mean=3.62 in the UK). This shared enthusiasm and positive outlook towards genAI highlight the potential for widespread adoption and the importance of developing effective strategies for its integration in educational settings.

Yet, when asked how to effectively introduce and leverage genAI in education, Chinese students appeared more unsure than their UK peers. This is evident from the low response rate to the open question, "Do you have any suggestions for how to effectively adopt genAI in higher education?" Only 7.2% of Chinese respondents (n=15) provided an answer, and they all attributed the responsibility to the university rather than offering personal insights. In contrast, over one-third of UK respondents provided thoughtful suggestions based on personal experiences.

There are two reasons why Chinese students' students are unsure about how to effectively use genAI tools. First, students do not have access to genAI tools, as most global mainstream tools are prohibited in China (Cheng, 2024). This limited access prevents students from effectively interacting with genAI tools and gaining valuable insights from these interactions. Second, there is a lack of targeted support from the university. Without proper guidance, students struggle to understand which uses of genAI tools are "*appropriate and allowed*" in the learning context. This uncertainty can lead to hesitation and a lack of confidence in identifying effective use cases of genAI in their learning.

5. Discussion and implications

Our study provides valuable insights into Chinese and UK students' use of genAI tools. Aligned with previous literature (e.g. Barrett & Pack, 2023; Chan & Hu, 2023), both groups of students have a positive attitude towards genAI tools and are keen to use them effectively in their learning and future development. This shared attitude further underscores the importance of integrating genAI tools into educational contexts, as addressed by UNESCO (UNESCO, 2023). While affirming the importance of incorporating genAI in education, we also uncovered new insights by highlighting differences in landscapes in genAI usage between Western and non-Western students.

Notably, compared to their UK peers, Chinese students tend to be more constrained in their use of genAI tools. They have restricted access to various genAI tools, especially mainstream ones like ChatGPT (Cheng, 2023). This limited access hinders Chinese students from gaining direct experience and personal insights on how to effectively use these tools. Worse still, most Chinese universities do not seem to support their students in adopting genAI tools. In China, only a few universities have launched guidelines regarding genAI, and most of these focus on banning its use (Liu et al., 2023), which leaves Chinese students even more unsure about how to effectively benefit from genAI tools.

In contrast, students in Western universities are encouraged and supported to use genAI. For example, the Russell Group in the UK, which consists of 24 research-intensive universities, has launched guidelines for supporting students about how to use genAI ethically

[3] We employed a 5-point Likert scale to capture respondents' views on the statements above, ranking from strongly disagree=1 to strongly agree =5

(Wood, 2023; Russell Group, 2023). Consequently, students in these universities tend to have a clearer understanding of how to integrate genAI tools into their academic work effectively.

Interestingly, our study suggests that despite having greater access to genAI tools and better support, UK students share the same concerns as Chinese students regarding their use. Both groups expressed worries about the quality of genAI-produced outputs and the risks to academic integrity, concerns also highlighted in other studies (e.g., Cheng & Yim, 2024; Tayag & Tayag, 2024). These consistent concerns may stem from shortcomings in existing guidelines and policies, which mostly focus on restricting the unethical use of genAI tools, particularly for writing assignments, rather than providing practical guidance on managing these tools effectively (Bannister et al., 2024). Instead of encouraging and educating on proper use, such restrictive guidelines may increase students' worries about the legitimacy of their genAI use and hinder them from fully benefiting from these tools.

To address students' concerns and ensure equal benefits from genAI for both Western and non-Western students, more flexible and adaptable policies and guidelines are needed. We propose that three types of policies and guidelines be developed.

First, our study shows that the restriction causes Chinese students to rely more heavily on locally developed generative AI tools, which often lack global recognition. There is a need for policies that fund projects on non-Western generative AI to enhance understanding and governance of these tools in non-Western contexts. Such initiatives could help prevent a digital divide and mitigate potential knowledge gaps in generative AI technologies across different regions.

Second, shared concerns about academic integrity and low-quality generated content among Chinese and UK students highlight the need for clear institutional guidelines. These guidelines should address not only the penalties for academic misconduct but also clarify what constitutes academic malpractice versus ethical use of generative AI. Providing practical examples and their analysis would enable students to confidently use generative AI in an ethical manner.

Third, policies and guidelines should adopt a global standpoint. For universities currently lacking effective genAI usage, these policies can serve as insightful starting points, encouraging the adoption of these tools. For universities that have already embraced and supported genAI, a globally-focused policy can help them better accommodate the needs of international students, given the increasing student mobility (Hou & Du, 2022). This approach ensures that all students can equally benefit from technological advancements, aligning with UNESCO's goal of guaranteeing an inclusive learning environment globally (UNESCO, 2023). To ensure a global perspective in policy and guideline development, it is crucial to learn from multinational universities and students, especially those with restricted access to mainstream tools. Their perspectives can provide valuable insights into alternative tools and strategies that have proven effective in their contexts. These insights, in turn, can inform the development of more adaptable and comprehensive policies that are applicable on a global scale.

Fourth, the scope of the policies and guidelines should be expanded to focus on the entire learning process and include practical training rather than just theoretical instruction. This approach will make the guidelines more meaningful and relevant for students, as their use of genAI tools often extends beyond writing assignments (Chan & Hu, 2023), which current guidelines predominantly focus on. Incorporating practical training, such as AI literacy programs (Zhao, Cox & Cai, 2024), will translate theoretical knowledge into hands-on experience, making the guidelines more beneficial to students. This method helps students develop the skills needed to use genAI tools effectively and ethically, ensuring they can confidently and competently integrate these technologies into their academic work.

Finally, students should be more deeply involved in developing the policies and guidelines. This involvement will provide a genuine understanding of how students use genAI tools, allowing for the identification of best practices that can guide effective and ethical use (Jin et al., 2024). Also, this participatory approach can foster a sense of transparency and accountability, enhancing students' willingness to adhere to and support these policies and guidelines (Bannister et al., 2024).

Our study has some limitations that bring avenues for future research. Firstly, our study is exploratory and represents the initial report of a cross-national survey. Consequently, we focused only on comparing results between the UK and China. Our subsequent research will report a cross-national study comparing the use and attitudes toward generative AI among students in various countries, including China, the USA, the UK, Italy, and Sweden, Mexico, Jordan, Saudi Arabia. Secondly, our sample had a higher proportion of female participants and more undergraduates than postgraduates. Future studies should aim for a more balanced demographic representation to enhance the generalizability of the findings Thirdly, our data from the Chinese context was primarily collected from Hong Kong and Macao, where fewer restrictions apply compared to mainland China. This data provides valuable insights into the perspectives of Chinese

students in regions where local policies restrict the use of mainstream generative AI technologies. We were able to compare these insights with the UK context, where no government restrictions are in place. However, we must acknowledge that while these insights are valuable, they do not represent the broader context in China, particularly in mainland China, where students do not have access to these technologies. As a result, we were unable to collect relevant data to compare usage patterns and perspectives across all regions of China. Future research should also consider conducting in-depth interviews based on the survey results of this study, particularly to explore how regulatory environments may shape perceptions and user experiences. Fourth, since our project is exploratory in nature, we have adopted a traditional inductive survey methodology. This approach includes three main sections: demographic information, the primary GenAI tools used and attitudes toward them, and usage behavior. The survey was reviewed by a group of staff members, including the IT team, academic staff, and students. However, we did not examine longitudinal patterns by dividing the survey into phases such as initial use, regular use, challenges, and long-term use. Future studies could employ experimental methods to monitor actual usage over time, including pre-test and post-test surveys, to compare the short-term and long-term impacts of these tools on student learning. Finally, our study included participants from a wide range of subject backgrounds, as our primary interest was the generative use of GenAI across different countries rather than specific academic disciplines. However, we acknowledge that there is disparity in our sampling, where Chinese students were more focused on humanities, while UK students were more concentrated in Social Science and Science and Engineering. Research has indicated that subject discipline can influence students' use of educational technologies. Future research should aim for a more balanced and comparable academic disciplinary focus following the results of our exploratory project.

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