

PAPER

A Sociological Take on Language Generative AI Tools

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United KingdomVct2@stir.ac.uk**ABSTRACT**

Language represents the medium in which human experiences are uniquely encoded by how an individual processes and produces language. The development of generative artificial intelligence tools such as ChatGPT created a challenge in the context of education due to how humans, being humans, often employ tools in unconventional ways as hallmarks of our creativity and critical thinking. Efforts to resist the incursion of AI into academic work have evidently failed, as observable from how the Russell Group changed its stance from prior bans on AI to the current acceptance of AI to a large degree (4 July 2023). This acceptance created tremors for the longstanding traditions of knowledge acquisition and production, which many academics are paying increasing attention to. In a bid to better understand the impact of such acceptance, the study was carried out to investigate the impact of AI use for sociological work. Employing a pilot study of a pragmatic approach with 20 graduates, it was found that while there was an even distribution of preference between personal writing and AI writing, academic submission preferences scaled towards AI writing. Preference for AI writing for submission was noted to be twice that of personal writing, despite an even distribution of preference. Findings also noted the qualitative differences between personal writing (268 words with 84 unique words) and AI writing (250 with 10 unique words) in word range and unique words. The analysis notes significant differences in word range between personal writing (± 35.93) and AI writing (± 4.28), reflecting a convergence of writing rhetoric that proves to be largely detrimental to sociological developments. The discussion presents considerations in three dimensions: the challenge on education, the challenge on language education, and the challenge on the sociological lens.

KEYWORDS

ChatGPT, critical education, generative AI tools, languages, pragmatism

1 INTRODUCTION

In the history of societal development, languages and their development played a significant role. Languages play the arbitrary role of a patterned set of symbols that could be either vocal or written, which serves the function of communication. As social beings, human functioning then revolves around the application of language as the medium to understand and be understood. With this understanding, many

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then argue that language itself served as one of the most important factors that propagated human development throughout history. Human progress through industrial revolutions sees advancements by leaps and bounds propelled by new technologies that appear every few years. Artificial intelligence (AI) tools are perhaps the most important technological advancement since the beginning of the 2000s. While study and development have constantly employed AI tools in their process, where tools were traditionally used to conduct study and analyze aspects of study, its capabilities now also include descriptive production in the form of writing using large language models. The social sciences prove to be more vulnerable to such development in that, in its broadest sense, the discipline refers to the study of society and the way people behave and influence the world around us [3]. Much understanding of social sciences is based on language and its discourse, which includes all of its dichotomies and analogies. The very descriptive nature of the human sciences is reflected in all its epistemic and ontological processes revolving around language. It is this very dependency on language that reflects its vulnerability to generative AI tools such as ChatGPT. This vulnerability becomes further amplified in the context of academic work, where such vulnerability creates concerning implications for social science developments. The study adopts a pragmatic perspective in positioning these concerns from an applied context in a real-world setting by seeking recent university graduates as participants. The study sets out to investigate the potential impact of the acceptance of AI into academic work, particularly in the social sciences, where language serves as the primary study artifact, methodology, and eventual product.

1.1 Artificial intelligence

Artificial intelligence is by no means an invention of the 21st century. The earlier name of cybernetics was perhaps the better word to effectively position AI in how it effectively unifies mathematical theory, electronics, and automation as “a whole theory of control and communication” [10]. AI development faced challenges and trepidation in the early 1960s to 1980s due to limitations of technological and social infrastructure, which were then not ready. Perhaps the two most critical developments that boosted the development of AI can be found in (1) the Internet and (2) the deep learning system. The origin of the Internet could be dated back to January 1, 1983, when researchers began to assemble the “network of networks” that eventually became the modern Internet [10, 11]. Serving as the springboard in its allowance to access data, internet use grew exponentially. From 130 websites in 1993 and 0.05% global connection, it grew exponentially to over 100,000 websites by 1994. By 2020, 60% of the world’s population was online [11]. What presented together with this level of reach is the massive volumes of data generated, which are accessible [10, 12]. The term coined ‘Big Data’ effectively refers to the consolidation of all available data through the internet itself in digital form, which facilitates linkage and automaticity to earlier data [12]. The value of these data can be observed through their integration with each other, which could be used to form analysis, organization, retrieval, and modeling. The second critical development of the deep learning system could be traced back to what would be defined as the expert systems. Expert systems were approaches in AI that started as early as the 1970s that aimed to use the knowledge of experts to create a program to answer questions in a clearly defined arena of knowledge through the use of “rules” of logic [9]. Of the most well-known successes would be the chess game between *Deep Blue* (IBM’s expert system) and *Garry Kasparov* (chess grandmaster and former World Chess Champion), which *Deep Blue* won. *Deep Blue* was a system designed to evaluate and weigh all possible moves in

the chess game through an algorithm that many would criticize as very limited compared to ‘real-world complexity’ [10]. This limitation, however, is slowly diminishing with the assistance of big data developments and the improving high efficiency of computer graphics card processors [12]. The capability of ‘deep learning’ and/or ‘machine learning’ created possibilities for machine processing to overcome the limitations of ‘real-world complexity’. LLM in forms of data, together with deep learning technology, form what would be known as natural language processing (NLP) [9, 13].

1.2 Context of language as an interpreted experience

Language has long been accepted as a representation of the interpreted experience we have of the world in that we use it to encode experiences and transfer these experiences to others through written or spoken form [8]. *Piaget* defined four stages of knowledge development: the sensorimotor stage, the preoperational stage, the concrete operational stage, and the formal operational stage. In schemas, assimilation, accommodation, adaptation, and equilibrium, he provided a roadmap for how knowledge develops through each stage in a procedural order [1]. Language, as a form of knowledge and skills, has also been widely developed from this structure in much educational study [6]. In language studies, lexical, morphological, and syntactic aspects of language form one approach to understanding [8], while the others of meaning of discourse with relation to the extralinguistic context form the other parallel [8]. The social nature of language sees language function within specific contextual functions, which compels it to act in specific ways. Sociolinguistics draws on social theories in the analysis of the relationship between agent and structure and the role of language in the creation, maintenance, and change of social institutions. Presenting language not only as a tool but also as a social phenomenon in that it forms a dichotomy in that it presents as the system, the process, and the product [6]. The pedagogical relations between the experiential nature of relationships and the variation of linguistic structures, language awareness, then naturally construct the world as we know it [7]. Humanities in general are very much informed by language in the sense that language represents the medium that embodies how we encode and transfer knowledge [42], that it provides the contextual relevance of any form of scientifically sound or acceptable statement. Rather than define a space of where it is relevant, its understanding places the humanities central in education [3]. *Perez* (2012) used language in applications of conceptual modeling as a crucial technique for exploring, understanding, documenting, and communicating complex domains [5]. It is important to note that it is not how language is discussed but for the fact that it is discussed at all.

1.3 Language and AI

The creation of NLP literally redefined the context of language and its uses in the academic world. Using *reinforcement learning from human feedback* (RLHF), GPT 3.5 was fashioned from 175 billion parameters to respond in a human-like manner. According to the latest available data, ChatGPT currently has over 100 million users, while its website, *openai.com* website generated 1.6 billion visits in June 2023 [15, 17]. Its NLP and generative pretrained transformer (GPT) capabilities made it a highly sophisticated chatbot capable of fulfilling a wide range of text-based requests [37]. It was these very extraordinary abilities of ChatGPT to perform complex tasks that caused mixed feelings among educators [18]. Its linguistic capabilities as well as operation functions allow it to generate writings based on requests entered by users,

which are ever improving. Concerns of academic authenticity highlighted by several institutes of higher education as well as extensive media reports of academic investigation surfaced between 2022 and 2023. Universities in the UK, as well as the US, had to act in response to adopt a different approach on ChatGPT and other generative AI technologies due to the prevalence of their use.

The Russell Group Statement and real-world pragmatics. Responding to this overwhelming development, the Russell Group universities changed the stance from their explicitly banned students from using ChatGPT to an open statement of acceptance on 4 July 2023. Their statement highlighted five pertinent points on the stance on generative AI tools, which served as guiding principles on their use. From the release, they provided definitions of its acceptance and application in the sense of embracing new technologies to enhance and enable both students and staff. From the statement itself, the points of ‘appropriate’, ‘ethical’, and ‘integrity’, despite being the most critical, are also present as the greyest in the academic sense. This paper, however, does not wish to also fall into this rabbit hole of debate but rather adopt a more pragmatism-aligned approach to understanding this development. Investigation into the data available on real-world uses of ChatGPT and the user demographics generates the following realities.

Statista trackers indicate that those under 34 account for over 60% of ChatGPT users. Trackers indicated that global traffic captured a 9.7% drop while unique visitors were down 5.7% in June, of which traffic drop in the US in month-over-month decline was 10.3% [14]. This was similarly reported by other sources, such as *Reuters* [16]. Parallel trends were observed when the demographics and timeline were compared to the UK and US as the largest tracked student bodies. Ratios indicate that students under 34 accounted for about 84% of the student population in the UK and 77% in the US (for 2023). Accounting for the academic calendar of each country notes the following: For the UK, the first semester usually begins in August and lasts until the end of December, including exams, and the second semester runs from January/February to May/June. For the US, the autumn term covers September–December, the spring term January–March, the summer term April–June (undergraduate), and April–August (postgraduate). The following can be concluded using abductive logic:

- ChatGPT user demographics (about 62%) match student demographics in higher education (for the UK, 84%, and 77% for the US).
- ChatGPT usage dip (9.7% global) in June coincides with academic breaks in both the UK (academic break from June to August) and US (academic break from June to September for undergraduates).

The data suggests that ChatGPT demographics and traffic strongly associate with academic profiles, which suggests that ChatGPT gained wide acceptance and is employed in the academic field, dating from its acceptance by the Russell Group. This concurs with general study on ChatGPT usage of university students both in the US and UK.

1.4 Relevant literature

Study on the actual impact of language-generative tools in the social sciences is a very recent development that gained movement beginning in the 2020s and is thus very limited. Literature does warn of the risk of application in different social sciences disciplines as early as 2019. In education, Richter et al. conducted a systematic review of 146 articles on AI applications in higher education and concluded that study in the

field overall lacks critical reflection on the challenges and risks of AI in education. They further attribute the weak connection to theoretical pedagogical perspectives and the need for further exploration of ethical and educational approaches [40]. In another systemic review by Bozkurt et al. they highlighted similar findings in that there is a lack of literature dealing with ethics. They further highlighted sociological limitations in that in the construct of data, AI is not immune to bias in that their own agendas or biases in their development stages [41]. This call for a sociological lens in development is similarly made by others, such as Kelly et al. [42]. Nah et al. [43] noted how ChatGPT is among the most disruptive technology breakthroughs in recent years in their study on Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration. They made critical remarks on how education will need to be transformed to better meet the challenges that technological advancement brings [43]. Malinka et al. gathered data regarding the effectiveness and usability of ChatGPT for meeting all requirements of completing and obtaining a university program on computer security-oriented specialization. Their result was generated from 50 assignment types for each category of examination methods of full text exam, test, Term essays, and programming assignments. From the different possible combinations, their test noted how AI scores higher than actual students in three sets but scores lower in the direct-knowledge test component. Their results indicate that ChatGPT did well overall and can pass all courses for a university degree, highlighting how easily it could be misused [44]. Study has also indicated that it was not possible to distinguish between ChatGPT/AI and human writing. Casal and Kessler researched the extent to which linguists and reviewers from top journals can distinguish AI from human-generated writing. They gathered 72 linguist participants that reviewed four abstracts, of which 18.1% identified three correctly, 34.7% identified two correctly, 34.7% properly identified only one correctly, and 12.5% did not identify any correctly. Their findings concluded that despite employing multiple rationales to judge texts, reviewers were largely unsuccessful in identifying AI versus human writing, with an overall positive identification rate of only 38.9% [45].

1.5 Summary

In summary, the context of language as the material, process, and product of knowledge creation sees firm establishment in the social sciences. Language presents within itself the sociological space where meanings and their rhetoric are built upon, that which, at the advent of generative AI, a different dynamic of use and production was created. The ideal position that comes with academic acceptance of AI into academic work creates further implications with all its concerns in ethical and theoretical applications. Furthermore, study has also established that its current abilities have already matched actual human performance and that detection in current times has not proven to be successful. The limited study on the subject, given that it is a recent development, limits our understanding and awareness of future risks and implications. The study objective thus sets forth to investigate the effects of language-generative AI tools if they were used on social science production to add to the body of knowledge and fill literature gaps.

2 METHODOLOGY

The focus on pragmatism, first coined by Thomas Kuhn in 1970 [20], suggests a multi-paradigm approach to looking at social reality rather than a single dimension

of understandings so as to provide a broader understanding of the phenomena being investigated. These paradigms are important investigated parameters because they function as the heuristics of social reality [20]. The pragmatism position looks at lived experience in the sense that ‘what works’, which presents as the pertinent study interest compared to other variables of interest [19, 21]. Adhering to pragmatism principles, the researcher carried out a pilot experiment to investigate writing production in a student-graduate context. Student-graduates were recruited to perform two writings, first of their own attempt and the second of them using AI, after which they were asked for their preference for different agendas. It is to be noted that the researcher’s attempt (S1) was also included in the findings and analysis as valid data.

2.1 Pilot testing

A question of ‘*In less than 250 words, how would you define or understand feminism? Provide a short example to either support or illustrate your point.*’ were provided to twenty postgraduates who graduated between 2022 and 2023 across different disciplines to answer. The only control applied was for the participants to use only Chat3.5 for question two. The purposeful sample included twelve participants with English as L2 and eight with English as L1. Participants were asked to select one for their personal preferences and one for academic submission, noting that no ethical or moral judgment will be passed. Duration and time spent on answering the questions were recorded. It was noted that all participants already had OpenAI accounts except for two. Account usage was provided for the two participants who did not have accounts.

3 FINDINGS AND ANALYSIS

As general data was captured on the time taken to complete both writings, a scatter plot was employed to capture the average time taken and time trend to complete both writings (see Figure 1). Sample 19 was omitted from the plot due to inflated timing for *Writing 1* (24 minutes and 17 seconds). The average time taken for completing *Writing 1* was noted at **7 minutes, 47 seconds**, and **1 minute, 58 seconds** for *Writing 2*. Findings note that *Writing 2* took considerably less time than *Writing 1*.

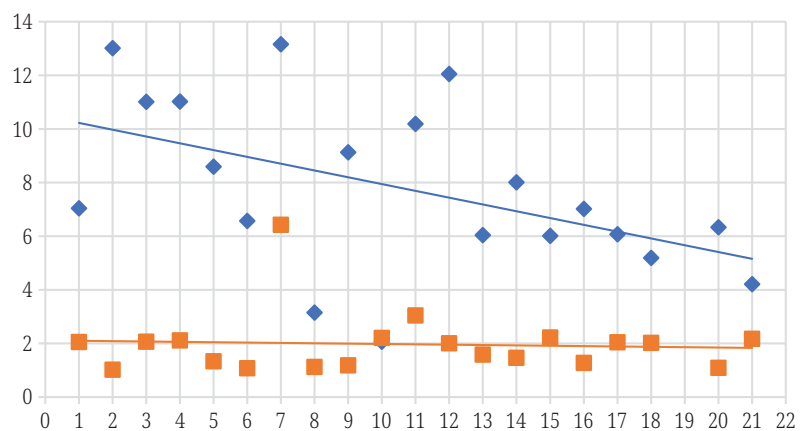


Fig. 1. Scatterplot for time taken to complete Writing 1 and Writing 2

Note: **Time taken for sample 19 was omitted due to inflated time readings.

Findings also note that time taken for completing **Writing 1 (shortest at 2 minutes and 6 seconds, longest at 13 minutes and 1 second)** has a much larger range compared to *Writing 2*, where a smaller range is present (**shortest at 1 minute and 2 seconds, longest at 6 minutes and 42 seconds**) (see Figure 1). It is to note that the shortest timing recorded for *Writing 1* (S8) is noted to be an outlier against the rest of the group, similar to how the longest timing recorded for *Writing 2* (S7).

An even distribution was observed between the two writings (**48% (10 for Writing 1)/52% (11 for Writing 2)**) for the participant's personal preference. Submission preference, however, scaled towards *Writing 2* (**33% (7 for Writing 1)/67% (14 for Writing 2)**). This would indicate that despite the even distribution of personal preference, participants prefer to submit **Writing 2 (AI writing)** when academic submission (see Figure 2). Findings on choice shifts between preference and submission see a 33% shift between the two writings (**33% (7 changed from preference to submission)/67% (no change)**). The finding suggests that when different contexts are present, participants will adjust their submission according to the set agenda. Further findings on the choice shift see **2 out of the 7** changing from preference for *Writing 2* to selecting *Writing 1* for submission, while **5 out of 7** changed from *Writing 1* to *Writing 2* (see Figure 2).

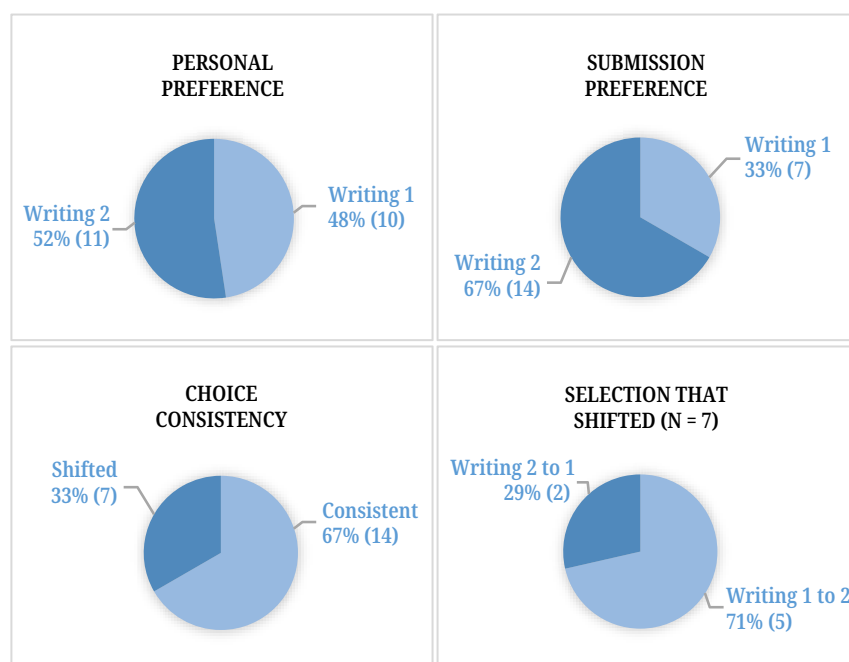


Fig. 2. Q3 and Q4 choice selections

From a quantitative dimension, total word count for Q1 is 1943 and Q2 is 2488. A word cloud was generated, which displayed general consensus between both writings. Word frequencies were noted to be extremely high in *Writing 2* compared to *Writing 1*, with the most frequent word use of 'gender' noted 64 times in *Writing 2* compared to the 34 counts of 'women' in *Writing 1*. The order of words based on word frequency similarly also demonstrates some differences in words such as *gender* (**W1 – 6th/W2 – 1st**), *females* (**W1 – 5th/W2 – not present**), and *advocating* (**W1 – not present/W2 – 7th**). Word stem sees even larger divergences in that many of the words were not observed when both writings were compared. *Writing 1* had a word range of **268 words with 84 unique words**, while *Writing 2* had a word range of **250 with 10 unique words**.

Table 1. Findings from Writings (N = 21 (including researcher’s attempt))

Writing 1 Word Cloud & Frequency	Writing 2 Word Cloud & Frequency																																																																																																																																																						
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Several pertinent points can be drawn from the findings of the small-scale study in: (1) Although participants’ preferences between their own writings and AI writings are generally evenly distributed, in selecting a writing for academic submission they preferred the one written by AI; (2) both human and AI writing displayed high similarities at superficial levels but displayed divergence in word use and range when deep analysis was conducted. The following analysis was conducted based on the findings presented in the data:

Confidence interval calculation is defined as:

$$x \pm zs\sqrt{n} \tag{1}$$

Confidence interval between two samples calculation defined as:

$$\mu1 - \mu2 = (M1 - M2) \pm ts(M1 - M2) \tag{2}$$

Writing Sample N = 21		SD (95% CI)	95% CI between Two Sample
Writing 1	Word count: 1943 Word range: 268 Unique word: 84	[232.07 – 303.93] ± 35.93	[-19.31 – 55.31] ± 37.31
Writing 2	Word count: 2488 Word range: 250 Unique words: 10	[245.72 – 254.28] ± 4.28	

Two-tailed hypothesis z score test for two population proportions calculation defined as:

$$z = \frac{p_1 - p_2 - 0}{\sqrt{p(1-p)(\frac{1}{n_1} + \frac{1}{n_2})}} \quad (3)$$

Effect size was calculation defined as:

$$\Delta = \frac{M_1 - M_2}{\sigma_{control}} \quad (4)$$

Population Effect and Proportion Test		
Two-tailed hypothesis z score test for two population proportions	3.8497	p is .00012.
Effect size	Cohen's d = (268 – 250)/59.816386 = 0.300921. Glass's delta = (268 – 250)/10 = 1.8. Hedges' g = (268 – 250)/56.125066 = 0.320712.	

At 95% confidence, the difference between the two samples means (± 35.93, ± 4.28) lies between –19.31 and 55.31 (± 37.31).

Difference between the two population proportions: the value of z is 3.8497. The value of p is .00012. The result is significant at $p < .05$.

Glass's Delta was accepted as standard deviations were significantly different between groups while having a similar sample size. Glass's delta = (268 – 250)/10 = 1.8, noting a significant size effect.

The findings and analysis reveal that (1) there are significant effects of using AI tools to conduct writing and that (2) student-graduates display preference to submit AI writing over their personal writing regardless of personal preferences.

4 DISCUSSION

The following points of discussion expand from the analysis seeking to calibrate between the findings and analysis to concepts of pragmatic perspectives in experience, inquiry, habit, and transaction, the concepts of sociolinguistics and language education, and the study of social sciences in its primacy.

4.1 The challenge in education

With consideration restricted to education, students are critical actors in how they are both producers and products of education. Findings note the distinctive selection bias towards submitting work produced by AI for academic submission

presents a concerning effect. Not only did the findings indicate a selection bias, but the findings also noted that a quarter ($N = 5$) of the participants selected the writing by the AI despite the preference for their own writing (see Figure 2). While the motivation of choices was not investigated in this study, the reality of what it presented was that when conditions such as non-judgement and non-assessment were applied, participants selected AI works. This would indicate that, despite spending considerably more time completing a piece of work (see Figure 1), the choice of selecting the work completed by AI is largely preferred over preference of their own work. The pragmatic view considers the 'level of reality' in the sense that it looks at the objective social transaction [21], which, in this instance, is the selection of AI writing over human writing. It is this conscious decision itself that may well present a challenge to the institutional construct of education—that works by AI may be preferred over human. Inquiry can be understood as a conscious decision compared to a habitual automated response [25]. Where preference could be understood as an inquiry process, the selection for submission can be understood as a conscious decision. Wolfe in [24] noted how the concept of choice forms the basic structure of a society, agreed by many others, such as Dépelteau in [22], that they reflect reality in rational and calculated decisions rather than simply arbitrary. In a pragmatic sense, if the AI writing would be submitted and that the human writing would never see the light of day, much of what would have been valuable for the inquiry process would have been lost (Appendix 1). Literature often noted how the process of experiences always involves interpretation and that beliefs must be interpreted to generate action, and cyclically, actions must be interpreted to generate beliefs. The action of choice noted in the study challenges the integrity of the education process itself, that generically generated work is preferred over individual work.

4.2 The challenge in language education

The purposeful sampling of the study for L1 and L2 users was intentional in that part of the study design was to investigate if it had any effects on the choice of *writings*. This was, however, omitted due to concerns raised by some participants in that they do not feel comfortable for their language origin to be reflected in the study. However, the data still holds some relevance in that 67% of participants (14) chose AI writing for submission. Given the small sample size, omitting the researcher's submission (S1) from the data would account for 70% of the submission preference to be scaled towards the AI writing (see Figure 2). From the data collected, there is a stark difference in word frequencies between the two writings (refer to Table 1), which would suggest that *Writing 2* was more structured within a specific style of ideation, presentation, and grammar. It is important to note that participants came from a range of disciplines and language origins where consideration for subject knowledge is a variable that is not controlled. The study design specifically phrased the question to reduce subject knowledge bias by (1) personalizing the question in 'How would **you** define or understand feminism?' and (2) from an applied perspective of 'Provide a short example to either support or illustrate **your** point'. Given this consideration, participants could possibly have selected the AI writing simply due to its clarity of presentation in a disciplinary sense. This strongly supports the position of Berkenkotter, Huckin, and Ackerman in [33], that rhetorical language features within writings mark its acceptance into the national community of researchers. MacDonald, in [34], positions academic writing itself as a form of discipline, in that it is a socially constructed and negotiated process. She went on to clarify that

'how academics construct phenomena or whether the phenomena are 'really' out there, much can be said about how academic writers choose to represent their object of study (pg. 155).' Writing thus can be understood as a disciplinary endeavor in that its form and structure are deeply rooted in its disciplinary origin [4, 38, 39]. In language, the context of productive language (particularly writing) tends to be the most struggled-with component of language. Taking into account language pairs and writing band scores from IELTS, we see an overall negative correlation across almost all language pairs [32]. The study exposes a vulnerability to language education in that language as a skill could face challenges in the coming generation in that they no longer hold a practical function in the face of automated language tools. A sociological comparison can be observed from dying trades and skills demands in historical evidence. With the emergence of new technologies, social and structural shifts often follow closely behind. When language itself is seen as just a 'language system', the fear is that learning agendas may shift from learning the language to learning the system instead [29], skirting the learning of the language itself.

4.3 The challenge from the sociological lens

The social sciences, and a sociological lens if any, often see a conflux of disciplines that are less distinct of boundaries from other forms of physical sciences. In *The Study of Boundaries in the Social Sciences*, Lamont and Molnár [23] presented how boundaries have social, symbolic, and cultural mechanisms in the production of boundaries. Language has always been a large part of the social sciences as the medium used to describe and even as the investigated artifacts [3]. Disciplines such as etymology study languages through the passing of time and how society evolves around words and how words revolve around society [26, 27, 29]. Three specific trends observed from the data collected are that (1) the work written by the AI had a comparatively elevated word count (for the three highest frequency words: **34 counts for W1/64 counts for W2, 27 counts for W1/57 counts for W2, 21 counts for W1/36 counts for W2**), (2) that the number of word ranges used were not uniformed (**W1 had 1943 words in total and 268 words range used/W2 had 2488 words in total and 250 words range used**), and (3) that despite using more words, W1 revealed more unique words used compared to Q2 (**W1-84/W2-10**) (refer to Table 1). What the data suggested was that work by the AI reflected a narrow band of words, that it prefers/uses higher frequency words in its construction of answers/replies against the user's question. The diversity of textual materials, along with how they are employed to navigate diverse human-nature, human-human, and human-structure relationships, creates unique relational dynamics that underpin the study of humans as subjects [28]. Presented in the data is a potentially serious concern for the study of general sociology. Much discourse that language provides investigates the richness of both its range as well as its depth of complexity [28, 29]. Given the pragmatic reality that graduates choose to submit work that is more defined and structured, the bandwidth of linguistic use that reflects its richness and complexity may never be observed. Effect size was noted to be significant (*Glass's delta* = 1.8), noting the difference in word range having an effect on unique word count. Appendix 1 captures the unique words used in attempts to answer W1 and W2. Where the AI presented only 10 unique words, human writing captured 84 unique words. Words such as 'profession', 'undergraduate', 'wave', 'boy', and 'brother', for example, could be deeply investigated for a richer investigation (refer to Appendix 1). Even in the limited sample size of this study, there are numerous words such as

'life' (6 in W2), 'sexual' (not found in W2), 'belief' (2 in W2), and 'fight' (not found in W2) that would have been accounted for as high-frequency words in Q1 to not have been accounted for in the AI writing (see Figure 2). The effects of 'whiteout' or 'drowning out', as remarked by Latour (1993), have similar reflections in academia. Many different disciplines have prior highlighted concerns about such a trend, that it could be either an unconscious result or an intentional endeavor [30, 31]. What presents is that artifacts (words) that may have been worth exploring sociologically would eventually be lost.

5 CONCLUSION

It is important to state that this study does not serve as an assail to generative AI tools but for a more detailed consideration of how it can be better embraced, particularly in the social sciences. Specific to education and the traits of 'quality' education, critical thinking and their applied principles are important aspects to build upon [25, 26, 35]. Embracing technology is important to keep in step with technological advancements, but consideration into subject discipline demands should also be given adequate consideration. Prior study has indicated that educators need to be skilled in specific disciplines related to their skills, along with general skills knowledge and skill competencies [38, 39]. Specific to subject disciplines where different skills are valued differently, the importance of establishing a critical frame to understand core and critical skills can reap benefits in future-proofing education. In *Staying Critical* (2005), Carr and Kemmis highlighted concerns about the relevance of the criticalness of education in that it must contain an applied dimension. It is in this criticalness of education that students, as products of education, must reflect to stay practical, realistic, and true to educational aspiration [25]. Reeves in [26] emphasized the criticalness of education and educational study in that it must make distinctions between the goals and methods. Both the goal and method are seen as distinct from each other in that each presents a different paradigm in the educational sense of being an inquirer. Educators should be taught to effectively engage with technological tools to reflect the pragmatic reality of education in embracing technology [36, 45]. How contents are negotiated, curriculums are designed, and eventually how assessments are conducted at every level of education should coordinate to some degree to allow for the development of critical skills. Technological tools should be embraced with all their possibilities of aiding human learning instead of replacing them. The awareness of how technology affects all levels of education must be taken into consideration.

Another important aspect to raise is language education. Language serves as the fundamental tool humans use to understand our world. In language fundamentals, education educates students through different forms of engagement, which allows for subjectivism and interpretivism for exploration into different paradigms relevant to social realities [27]. Language discourse and development in the social sciences are very much dependent on language rhetoric that is observed and applied in social settings. In the event that language rhetoric converges, much of cultural diversity may be lost. Latour (2013) famously said, '*Action cannot be delayed because time does not flow from the present to the future—as if we had to choose between scenarios, hoping for the best—but as if time flowed from what is coming.*' If we do not emphasize the importance of language, its identity, and usage, future generations may develop a credible contest that disputes the need for language education itself. What that may bring would be that the much-valued diversity that classifies humans as having distinctively unique existence would cease to exist. In a sense, humans may really become more mechanized than humans if such a future is present.

5.1 Limitation and recommendation

A limitation of the study lay in this being a pilot study with a limited sample size. Future study could possibly include larger samples to better investigate preliminary findings from this study. While language of origin (L1) was omitted from this study due to the participant's request, this could be relevant for further investigation into whether different language pairs or regions respond differently to generative AI tools, specifically in the US or UK given that the educational language is English. Currently, the most developed AI generative tools are in English, but increasingly, development sees developments of generative AI tools in other languages, such as Chinese/Mandarin and Spanish. The importance of future studies, however, should be placed on the mechanics of use rather than the language in focus. Another possible consideration that was not included in this study was subject-based discipline. Subject-based discipline could be further explored to determine if discipline does affect the acceptance of generative AI tools. The context presents a plausibility for effects due to different language demands across disciplines.

Another noteworthy consideration for future study would be the analysis of sociological production in the future. This study represents a pilot study into student-graduate samples between the years of 2022 and 2023, of which findings indicate concerns with converging trends of sociological artifacts of language range and rhetoric. Future study could look into checks for such signs of convergence in academic production, which would present as a limitation to sociological developments. Such worrying signs are already being observed with analysis conducted on study publications with medical study. Should such findings present themselves, academic and disciplinary contexts may need to recalibrate to better account for what such trends may create for sociological production.

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7 APPENDIX

7.1 Appendix 1 – Unique Word List

Unique Words List – Writing 1					
Words					
domestic	requires	nowadays	holding	traction	boys
driven	restrictions	originating	identities	undergraduate	brother
empower	select	participate	inclined	various	business
ensuring	sexes	parts	institutions	waves	census
Europe	simply	permission	interests	well	children
exercise	societal	playing	investigated	west	committed
experiences	sphere	post	knowledge	western	conducting
falter	strengths	postgraduate	largely	worldwide	confined
father	striving	prevented	legal	agent	continue
field	structured	principles	manifested	although	course
full	student	professions	married	barred	denied
fully	support	property	medieval	behalf	despite
gain	tends	push	moreover	benefits	recruited
growth	throughout	qualifications	refers		
history	time	realize			
Unique Words List – Writing 2					
Words					
activists	often	feminist	similar	raise	
awareness	organizations	long	transparency	compensation	

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