Growing Online Interest in ERNIE Bot Released Since 2022: An Analysis of Baidu Index Data

Qinyi Tan[†]
 Center for Studies of Education and Psychology of Ethnic Minorities in Southwest China, Southwest University, Chongqing, China qinyi.tan@outlook.com https://orcid.org/0000-0002-2291-4554

Xin Liu[†]
 Center for Studies of Education and Psychology of Ethnic Minorities in Southwest China, Southwest University, Chongqing, China
2078668573@qq.com https://orcid.org/0009-0009-3677-8184

Luyan Teng*
College of International Education, Sichuan International Studies University, Chongqing, China
 luyan.teng@outlook.com https://orcid.org/0000-0001-7673-3217

†Equal contributors
*Corresponding Author

Abstract

Objective: Current evidence shows that since the launch of ERNIE (Enhanced Representation through kNowledge IntEgration) Bot, the public interest in it has been growing, which may have an impact in different fields. The purpose of this study is to quantitatively analyze the Baidu index of ERNIE Bot to reveal the public's attention to this technology and the trend of online search behavior in the past two years.

Methods: We used Baidu Index, a publicly available database to access query data in systematic and quantitative fashion, to search for key terms related to ERNIE Bot. We retrieved the search volume of two AI language models, ERNIE Bot and ChatGPT, extracted data over the time range from December 26, 2022(it is the inception of the comprehensive public release of large AI language models) to December 26, 2024. Results were given in search index.

Results: We observed that, since August 14, 2023, there has been a surge in public interest towards ERNIE Bot, preceded by fluctuations in this trend. Notably, this interest primarily dipped to its lowest ebb during traditional Chinese holidays, as well as winter and summer vacations. Compared with the same type of AI language model ChatGPT, the search interest of ERNIE Bot is significantly higher after August 14,2023.

Conclusion: The opening of ERNIE Bot to the public has sparked a notable increase in its visibility among the general populace. Its complimentary access, localized functionalities, and alignment with the educational requirements of the public have collectively sustained its search interest at an elevated level for an extended period. The escalating interest in ERNIE Bot among the public suggests a concurrent rise in market attention and user base, which is poised to foster its application across diverse domains such as education and enterprises. Consequently, this will generate a more diversified array of user needs and feedback.

Keywords: search engine, Baidu index, ERNIE Bot, ChatGPT, data mining

1. Introduction

The advent of generative artificial intelligence is significantly expediting the progression of human society towards an era of intelligent revolution, one that is spearheaded by a new generation of smart technologies (Qiu, & Qiang, 2024). In this trend, ERNIE Bot, the first AI large language model accessible to the entire society of China, has garnered extensive attention from various sectors, which lies in its extensive application prospects across multiple domains, as it is pointed out that ERNIE Bot leverages advanced artificial intelligence technology and possesses distinctive capabilities as a natural language processing product introduced by Baidu (Chen, Xu, Zhang, & Su. 2024). Intriguingly, emerging data indicates a significant correlation between the public's focus on ERNIE Bot and their educational needs. It is thus with great necessity to analyze the public's

cognitive and behavioral trends in paying attention to and using AI models such as ERNIE Bot. Moreover, existing researches mainly focus on utilizing it to diverse applications, ranging from medical examinations to journalistic writing proficiency evaluations, to demonstrate its versatility and effectiveness in various contexts withing the Chinese language domain. Thus, this study is the first to use Baidu Index to quantify the public's search interest in ERNIE Bot which is one of the important AI language models.

According to the Statistical Report on China's Internet Development, as of June 2024, the number of internet users in China is nearly 1.1 billion, an increase of 7.42 million compared to December 2023, with an internet penetration rate of 78.0% (CNNIC, 2024), which shows that the internet has become an important tool for information collection and acquisition. Baidu is the world's largest Chinese search engine, with a huge Chinese web page database that can quickly and accurately find relevant search results (Bergemann, Bonatti, & Smolin, 2018). Baidu has developed its Baidu Index service using massive data to provide search trends for specific keywords, obtain insights into changing netizen demands, track media public opinion trends, and identify user preferences (Tan, Yang, Lu, He, & Teng, 2024), and analysis in Baidu Index can predict the potential preferences (Bai, & Lu, 2022). Therefore, it is significant to use Baidu Index to make reference about public's interest in ERNIE Bot.

2. Methods

Similar to Google Trends, Baidu Index is a free tool that can be used to study the search interest in keywords and topics over time online (Nuti, Wayda, Ranasinghe, et al. 2014). The previous studies have used Baidu Index in the fields of inclusive education, knowledge management, mental health, disease prevention and control (Long et al., 2022; Tan et al., 2022a; Wang et al., 2020; He et al., 2022; Tan et al., 2022b). This study attempts to quantify public interest and online behavior in ERNIE Bot since the inception of the comprehensive public release of large AI language models with ERNIE Bot as the search keyword in comparison with ChatGPT, and data from December 26, 2022 to December 26, 2024 were extracted. It should be pointed out that ERNIE BOT is officially named as Wen Xin Yi Yan in Chinese, which is also used as the key term to search in Baidu Index. The studies have shown that big data sources contain rich detail, including perceptions, behaviors, and concerns, which provide a theoretical basis for research (Tan, Yang, Lu, He, & Teng, 2024). Mining such data can make inferences about the public's interest in ERNIE Bot. Results are reported in search index which shows Internet users' online interest to keyword search and its continuous change. All searches were carried out on December 26, 2024.

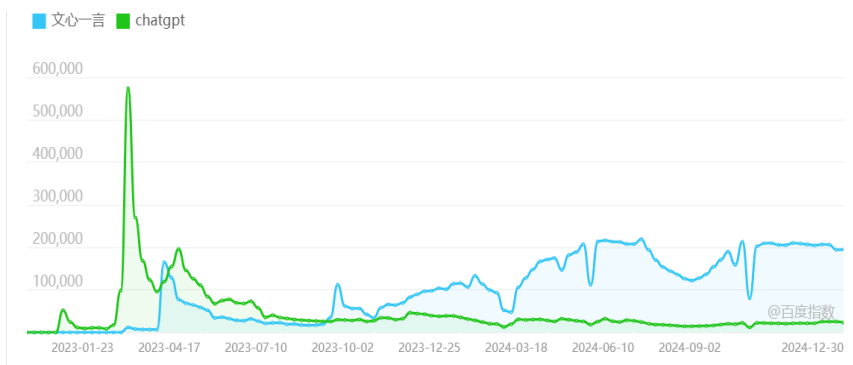**Figure 1 Chinese Online Search Trends for ERNIE Bot**

Figure 2 Baidu search volume index for ERNIE Bot (blue)and ChatGPT(green)

3. Results

Since August 14, 2023, the public's interest in ERNIE Bot has been rising overall, and its search index peaked on June 23, 2024 (Figure 1). Moreover, the data shows that during the holidays including winter and summer vacation, the public's search interest drops to a recent valley. During this period, compared with the same type of AI language large model ChatGPT, ERNIE Bot's search index is significantly higher (Figure 2). Comparing the 3 months prior to and following August 14, 2023, the search interest has increased by 150% and -30% for the search terms "ERNIE Bot" and "ChatGPT" respectively. In the same order of search terms, the public's interest changes are 140% and -55% in the following one year in November 12,2023, and the search volume of ChatGPT was 184,503 lower than that of ERNIE Bot during this period.

4. Discussion

The publics' interest in ERNIE Bot started to rise from mid-August 2023, mainly due to the company's own promotional marketing. On August 31, ERNIE Bot was the first to be fully open to the whole society (China Daily, 2023). Although the full opening is at the end of the month, the early publicity about the opening warm-up may have started in mid-August or earlier, which triggered a wave of users' searches for ERNIE Bot.

It has been noted that search engine data is sensitive to temporal and spatial variation (Rosenkrantz & Prabhu, 2016). During traditional Chinese holidays as well as summer and winter

vacations, public search interest in ERNIE Bot drops to a valley. For instance, this decline is observed during the Spring Festival in February of 2023, the Tomb Sweeping day from April 4 to 6, Labor Day from April 29 to May 5, and National Day from September 30 to October 7. During these times, the Chinese public typically spends more time with relatives and friends or engages in leisure activities (Tan, Wang, Teng, & He, 2022), which helps explain the observed decline in search interest.

However, the search interest begins to rise again after the holidays. Specifically, the search index peaked after the Spring Festival to June, corresponding to the spring semester and the pre-examination period in China, which is primarily due to users resuming their daily activities after the holidays and the growing demand for artificial intelligence tools. As an intelligent education assistant, learning tool, and writing tutor, ERNIE Bot has likely gained significant attention from the public, especially students and teachers, leading to its widespread use in educational settings. The previous studies pointed out that China's test-oriented education model has largely promoted the use of efficient learning tools, as this system evaluates students mainly through test scores, making the demand for such tools urgent among both students and parents (Li, 2024). The intense competition and lack of educational resources have further increased dependence on these services. Meanwhile, as educational reforms continue to intensify, personalized learning needs have become a widely discussed issue (Underwood & Banyard, 2020; Bond et al., 2021; Viberg et al., 2022; Drachsler, & Kirschner, 2022). Generation Z students, who were born in the digital age and are accustomed to learning through applications and mobile devices, often have diverse learning styles, interests, and abilities. The traditional "one-size-fits-all" teaching approach is often unable to meet their needs (Lalchandani, 2024). It is precisely this artificial intelligence tool that meets their personalized learning needs. Therefore, the search trend of ERNIE Bot is closely related to changes in the learning status of its users.

As similar AI products, the disparity in online interest between ERNIE Bot and ChatGPT serves as a significant indicator in reflecting technical influence and user demands. Therefore, it is imperative to conduct a comparative analysis of the difference in online attention between the two. The figure 2 shows that the search index of ChatGPT reached its peak in February 2023, but then the index began to fall sharply and gradually stabilized from mid-June 2023. After August 14, 2023, the search interest in ERNIE Bot gradually increased, while the search index of the former was always lower than that of the latter, which reflects that users' curiosity about ChatGPT is gradually weakening. As a study has pointed out that ChatGPT faces high costs, low accuracy of generated content, algorithmic bias and lack of explainability (China Development Observation, 2023). Therefore, public interest may gradually weaken due to practical application difficulties and academic challenges (Wang, & Zhang, 2023). ERNIE Bot large model is a highly localized AI model that aligns better with the usage habits in Chinese environment, and it not only provides vast amounts of foundational data but also holds significant advantages in Chinese search (Lu, Zuo, Jin, Zhang, & Zhang. 2024), which attracts the public's attention and indicates that the growing market attention and expanding user base are driving increased adoption across various fields, such as education and enterprise. As a result, user needs and feedback are becoming more diverse, further shaping its applications and enhancing its functionality.

Our study has limitations. First, the young generation is likely overrepresented due to more frequent Internet use (Adelhoefer, Henry, Blankstein, et al., 2021), so it does not represent the views of all; second, we cannot exclude that the selected query terms may have been entered for other reasons, such as product testing or promotional behavior by artificial intelligence developers

themselves. But in general, search volume data is valuable for studying the population at large, since the Baidu Index can represent the views of most Chinese netizens and contains data from 32 provinces (municipalities, autonomous regions and Hongkong special administrative region) in China.

5. Conclusion

There has been an overall increase in public search interest for ERNIE Bot since August 14, 2023, peaking during the period after the following year's Spring Festival to June. Notably, the interest drops to the valley during traditional Chinese holidays, as well as summer and winter vacations. The surge in public attention towards ERNIE Bot can be attributed to the full launch of AI products and evolving educational needs among the populace. In comparison, ChatGPT, another notable large AI language model, has gradually witnessed its search interest decline below that of ERNIE Bot after August 14, 2023. This trend can be largely associated with ERNIE Bot's advantages in terms of convenience, localization, and cost-effectiveness. These factors have collectively contributed to the shifting landscape of public interest in the AI language model market.

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