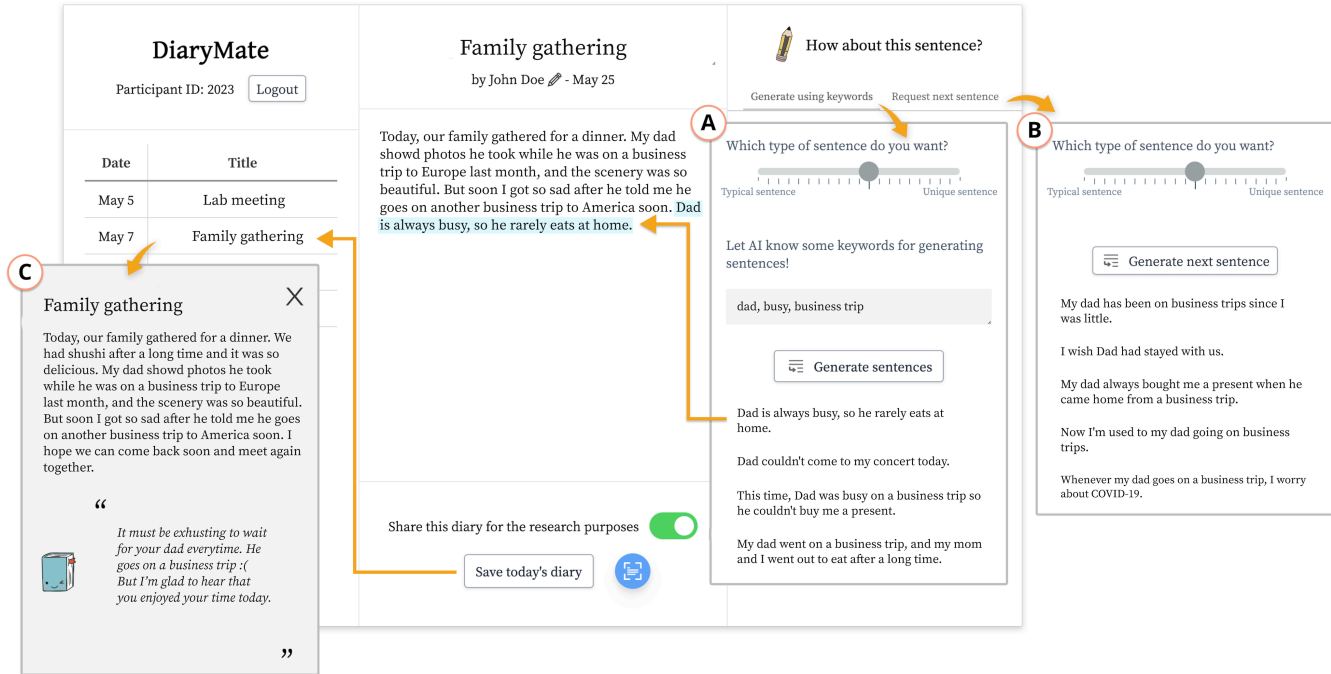# DiaryMate: Exploring the Roles of Large Language Models in Facilitating AI-mediated Journaling

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Figure 1: Keyscreen of DiaryMate. (a) Once users enter keywords into the text field, the system uses them as material and suggests up to five sentences. (b) The system also suggests up to five sentences based on the existing diary content, which can be appended to the existing diary. Once the user finishes writing the diary into the system, it is saved and shown in the table where (c) they can review it by clicking the entry

ABSTRACT

In this position paper, we report our ongoing research examining the use of large language models (LLMs) in promoting mental well-being through journaling. While journaling can be beneficial for expressing personal thoughts and emotions, it can be challenging for individuals who struggle to articulate their internal states into words. LLMs have the potential to assist with this by translating users' ambiguous thoughts and experience into writing. However, using LLMs in journaling can also have drawbacks, such as neglecting the personal context of users and reducing users' initiative in writing. To explore the opportunities and challenges of using LLMs in journaling, we conducted a field deployment study using Diary-Mate. The participants used the diverse sentences generated by the LLM to reflect on their past experiences from multiple perspectives and saw it as an empathetic partner. However, they gave excessive credibility to the LLM's generated sentences, often prioritizing its emotional expressions over their own. Based on the findings, we highlight the importance of considering the risks and benefits of using such technology in supporting personal reflection and emotional expression.

1 INTRODUCTION

A journal is a form of writing that continuously records an individual's past events, thoughts, and feelings. What sets a journal apart from other writing styles is that the person who writes the journal is the only reader. This characteristic makes journals a place where writers can express worries, thoughts, and feelings freely, without being judged by others [17, 18]. Studies have shown that journaling can provide further benefits to writers. Some empirical literature support that mental wellness and quality of life were improved when journaling [1, 13, 14, 19].

However, writing about one's past feelings and thoughts can be a complex process because people differ in their ability to understand, identify, and express their emotions [15]. For some individuals, including those undergoing psychotherapy, constructing a meaningful narrative that helps them understand their past and present life concerns can be a challenging aspect of the writing process [4]. Moreover, individuals may struggle with knowing how to begin sentences, maintaining a regular journaling schedule, and organizing their thoughts [17]. These challenges can make it difficult for people to start journaling and reap its potential benefits.

Recent research in the field of human-computer interaction (HCI) has found that large language models (LLMs) can help improve people's writing abilities by encouraging them to use a more diverse vocabulary and by assisting in the translation of ambiguous thoughts and ideas [3, 5, 10]. Previous studies have also demonstrated that interacting with a language model can help individuals disclose themselves for mental well-being [11, 12].

Nevertheless, it is important to note that applying LLMs to journaling requires careful consideration. This is because LLMs operate based on large-scale data and probability, meaning their output may not reflect an individual's personal experiences or emotions. For example, in a journal, where understanding the writer's context is essential, LLM may provide assistance that might not align with the writer's situation. Moreover, LLM may reduce a user's sense of agency [2] in the journal writing process and affect the perception of the journal (e.g., ownership [2, 10]). Given that little is known about how LLMs could be perceived in the journal writing context, exploring its use and value in it was considered necessary. Particularly in journal writing, where writing is personal and may affect depending on the environment, we believe it is crucial to let participants understand and explore the utility and capability of LLM technology in their life. Here, in this study, we mainly focused on the potential of technology probe (TP) approach in collecting data on how users embrace technology in their daily lives [8].

To this end, we developed DiaryMate, which allows users to write a journal using LLM. Our TP study was designed to investigate how users form a perception towards LLM and appropriate LLM in the context of journaling. DiaryMate is a writing assistant that supports users' journal-writing processes. Whenever users need assistance from the LLM, they can send a sentence generation request by several pre-defined keywords (See figure 1-(A)) or without specific inputs except texts they have already generated in the text field (See figure 1-(B)). Our system is aimed at users in Korea. Therefore, we chose to use HyperCLOVA [9], an LLM deployed in the Korean language, consisting of 82B parameters and trained on 560B Korean tokens to accommodate various few-shot learning tasks in Korean. We intend to use DiaryMate to explore how people embrace and perceive recent LLM technologies in journal writing. Through a 10-day deployment study, we collected data on how participants used DiaryMate and their perceptions and experiences.

2 FINDING AND DISCUSSION

In this section, we summarize the major themes of finding from a field deployment study, exploring how assistance from LLM can impact users in their journal writing practice.

Using LLM to revisit past feelings and thoughts from diverse perspectives: Overall, our participants rated the wide variety of sentences generated by the LLM as useful and interesting in their journaling. In a creative writing context (e.g., novel or story), such characteristics of LLM are used as an ideation tool that helps add new characters and scenes to the story or to change the mood [10, 20]. Our study identified the potential that diverse sentences from the LLM could support exploring human writers' thoughts and emotions in the journaling context. For example, in DiaryMate, participants usually wrote down their past experiences with inner feelings and emotions that are difficult to understand and articulate clearly. In such writing, they used sentences from the LLM to re-visit their past feelings and thoughts from diverse perspectives that LLM suggested.

Giving excessive credibility and meaning to LLM outputs: Our participants considered the LLM-generated sentences to be meaningful, as if they were looking into lived experiences and thoughts of other people. In addition, some participants used the output of the LLM as a reference point to reflect on their emotions. We wondered why people treat that way such LLM-generated sentences that might not fully represent the writer's personal contexts or feelings. One possible answer was that participants' existing knowledge of AI influenced their perception of the output from LLM [16]. Most participants knew the basic concept that AI operates on large datasets people generate. Based on this notion, participants believed that sentences from LLMs were practically the similar as the writings and expressions of real people. This perception became the basis for acceptance of LLM-generated sentences in their journaling processes.

Obtaining empathy and comfort while writing using the LLM: In our study, many participants perceived LLM as a co-writing entity that reads and responds to their writing. They expressed ambivalent wishes that while they want their journal to remain private, simultaneously, they want someone to read and respond to them. From this viewpoint, users rated DiaryMate as a system in which participants could freely write their thoughts in their private space while having someone (LLM) read the writing and provide responses, which is analogous to the earlier work which suggested that writing with a virtual agent can support people to express more about themselves [12]. LLM especially provide meaningful assistance because they are machines, not humans, and people may be reluctant to tell another person about their vulnerabilities by worrying about harming their reputation [6].

Biased towards feelings and emotions suggested by LLM: However, we also confirmed that LLM could negatively affect autonomy [2] in the writing process and users' perception of their journals. In our study, we identified the possibility that users could easily follow the algorithm's output rather than their judgment, especially when expressing emotions and feelings that are difficult to discern and describe objectively [7]. As a result, some participants reported that their written journals diverged from their initial intentions and plans, with some saying that they had unwittingly chosen LLM's suggestions or expressions. This user behavior is

similar to the findings from AI-based reflection work in that people override their inner-state evaluation and trust the output of AI algorithms [7].

3 CONCLUSION

In this position paper, we have addressed the opportunities and challenges of utilizing LLMs to support users' journal writing. Our findings have shown that using LLMs in journaling requires careful consideration and further exploration to ensure that the benefits of the technology can be realized without compromising the personal and emotional nature of the journaling experience.

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