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PRE-SERVICE ENGLISH TEACHERS' INSIGHTS AND DEMANDS ON THE APPLICATION OF CHATBOTS IN EDUCATION

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Abstrak *- Chatbot berbasis kecerdasan buatan telah membawa perubahan signifikan dalam pembelajaran Bahasa Inggris, yang menimbulkan tantangan bagi calon guru. Namun, persepsi dan kebutuhan calon guru Bahasa Inggris terkait integrasi chatbot dalam pembelajaran masih kurang diteliti. Penelitian ini bertujuan untuk mengeksplorasi: (1) pemahaman dasar dan sikap calon guru terhadap chatbot, (2) pandangan mereka mengenai penggunaan chatbot dalam pendidikan Bahasa Inggris, (3) persepsi tentang keunggulan dan tantangan penggunaan chatbot, serta (4) kebutuhan spesifik dalam mengintegrasikan chatbot ke dalam pengajaran. Dari Juni hingga September 2023, 12 calon guru Bahasa Inggris di Tiongkok dipilih secara purposive untuk wawancara semi-terstruktur, dan analisis tematik digunakan untuk mengidentifikasi tema utama. Hasil menunjukkan sikap yang umumnya positif terhadap chatbot, meskipun pemahaman mereka terbatas. Guru menilai chatbot dapat meningkatkan keterampilan bahasa, tetapi mengkhawatirkan masalah seperti plagiarisme. Mereka menekankan peran guru manusia yang tidak tergantikan dalam aspek moral, emosional, dan pembelajaran personal, serta menginginkan dukungan berupa kebijakan, pelatihan, dan dukungan sosial. Temuan ini memberikan wawasan penting tentang pandangan calon guru terhadap integrasi chatbot dalam pembelajaran Bahasa Inggris dan menjadi acuan bagi pengembangan pendidikan guru dan chatbot secara global.*

Kata kunci: Calon guru Bahasa Inggris, Chatbot dalam pendidikan, Pembelajaran Bahasa Inggris, Persepsi guru, Pembelajaran berbasis AI.

Abstract - Artificial intelligence-powered chatbots have brought notable transformations to English language education, posing challenges for pre-service teachers. However, pre-service English teachers' perspectives and requirements regarding the integration of chatbots in teaching remain underexplored. This study aimed to investigate Chinese pre-service English teachers' (1) foundational knowledge and attitudes toward chatbots, (2) views on using chatbots in English education, (3) perceived benefits and challenges of chatbot use, and (4) specific needs for incorporating chatbots into teaching. From June to September 2023, 12 Chinese pre-service English teachers were purposefully selected for semi-structured interviews, and thematic analysis was applied to extract core themes. Results indicated generally positive attitudes toward chatbots, despite limited understanding. Teachers acknowledged the potential of chatbots to enhance language skills but raised concerns such as plagiarism. They highlighted the irreplaceable role of human teachers in moral, emotional, and personalized instruction and expressed a need for supportive policies, training, and social backing. The findings provide valuable insights into pre-service teachers' perspectives on chatbot integration in English education and offer guidance for teacher education programs and chatbot development globally.

Keywords: Pre-service English teachers, Chatbots in education, English language teaching, Teacher perceptions, AI-assisted learning.

1. INTRODUCTION

In recent years, rapid advancements in artificial intelligence (AI) technology have significantly enhanced chatbot capabilities and accelerated their integration into educational settings (Okonkwo & Ade-Ibijola, 2020; Smutny & Schreiberova, 2020). According to Innovating Pedagogy 2023 by The Open University, the use of AI tools ranks among the top

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10 innovative methods, demonstrating their potential to trigger substantial changes in educational practice over the next 5–10 years (Kukulska-Hulme et al., 2023). One practical application of AI in education is the use of chatbots in teaching and learning. Chatbots are computer programs or agents that process user inputs and provide responses through AI technology (Okonkwo & Ade-Ibijola, 2020).

In the context of English education, chatbots can provide students with personalized, interactive, and engaging learning experiences (Mohamed, 2023), and they have been shown to support the development of listening (N. Y. Kim, 2018a), reading (Liu et al., 2022), writing (Guo & Wang, 2023), and speaking skills (Hwang et al., 2022; H. Yang et al., 2022). Despite these benefits, many teachers lack the competencies needed to effectively integrate chatbots into classroom practice. Teachers serve as crucial mediators for the integration of learning technologies.

Pre-service teachers, in particular, are in a transitional phase, developing technological skills and pedagogical knowledge, and their perceptions and beliefs are likely to influence their future teaching practices (Valtonen et al., 2020; Istenic et al., 2021; T. C. Yang & Chen, 2023). While some studies have examined in-service English teachers' perceptions of chatbots in teaching and learning (Bayram & Baturay, 2022; Nguyen, 2023), research exploring pre-service teachers' perceptions and needs regarding chatbot integration in English education remains limited. This gap poses challenges for curriculum designers and teacher educators in preparing pre-service teachers to effectively use chatbot technology in the classroom.

Therefore, this study aims to explore pre-service English teachers' (1) basic understanding of and attitudes toward chatbots, (2) perceptions of chatbot use in English education, (3) perceived advantages and challenges of chatbots, and (4) needs for integrating chatbots into English teaching. The findings are expected to provide international insights into pre-service teachers' views and requirements regarding AI-powered tools in English education. Additionally, this study may inform the design of pre-service teacher training programs, contribute to enhancing teachers' digital literacy, and offer directions for improving chatbot functionalities to better support teaching and learning processes.

2. LITERATURE REVIEW

2.1 AI Chatbots: Definition and Features

Advances in artificial intelligence (AI) have produced large language models (LLMs) that are increasingly applied in daily life (Guo & Wang, 2023). One prominent application of LLMs is chatbots, software designed to provide instant responses to users through natural language processing (NLP) and machine learning/deep learning techniques (Okonkwo & Ade-Ibijola, 2021; Zhai & Wibowo, 2022). Key features of AI chatbots include real-time responses, large data support, and the ability to handle various inputs and outputs (Chan & Lee, 2023; Zhai & Wibowo, 2022). A well-known example is ChatGPT (Guo & Wang, 2023), which supports text, voice, and visual interactions. Its applications are broad, including article writing, marketing, summarizing literature, and educational support (Taecharungroj, 2023; George & George, 2023).

2.2 Applications of AI Chatbots in English Teaching and Learning

AI chatbots offer affordances such as ease of use, real-time interaction, and personalized experiences, supporting authentic language learning (W. Huang et al., 2022; Z. Zhang & Hong, 2023). Their use in English language teaching can be categorized into three stages:

1) Pre-Class: Providing learning resources, analyzing texts, assessing students' language proficiency, and assisting teachers in lesson planning (Hsu et al., 2021; Zhang & Hong, 2023).
2) While-Class: Facilitating language practice through simulations and role-play, answering students' questions, and enhancing motivation and engagement (Kohnke, 2022; H. Yang et al., 2022).
3) Post-Class: Delivering personalized guidance, evaluating writing tasks, offering socio-emotional support, and enabling artifact-based interactions to improve language skills and learning motivation (Huang et al., 2022; Liu et al., 2022; J. Kim et al., 2022).

2.3 Teachers' Perceptions and Needs in Using AI Chatbots

The successful adoption of educational technology depends heavily on teachers' perceptions, particularly perceived usefulness and perceived ease of use. Research shows that teachers' perceptions influence the integration of chatbots in English language teaching for both in-service and pre-service teachers (Chuah & Kabilan, 2021; J. Yang, 2022; Ulla et al., 2023). In addition to perceptions, teachers' needs regarding AI are critical. Needs analysis can be conducted using the Present Situation Analysis (PSA) model, which focuses on identifying gaps between current competencies and target skills. This analysis helps pre-service teachers enhance their ability to effectively implement AI chatbots in English classrooms.

2.4 Pre-Service Teacher Education in the AI Era

Teachers play a crucial role in integrating new technologies into curricula. However, AI anxiety stemming from learning dimensions, potential job displacement, and AI system configurations may affect the adoption of chatbots (Hopcan et al., 2023). Therefore, pre-service teacher education must equip future teachers with the necessary knowledge and skills to confidently and effectively use AI chatbots in English language instruction.

3. METHOD

2.1 Participants

The participants were purposefully selected from a provincial teacher-training university in Indonesia to minimize the influence of regional differences. A total of 12 Indonesian pre-service English teachers were recruited, with careful consideration of gender, grade level, and teaching experience.

2.2 Data Collection

Semi-structured interviews were employed to explore the perceptions and needs of pre-service English teachers regarding the integration of chatbots into English language education. The interview questions were developed based on a thorough literature review and the practical experiences of pre-service teachers. The questions were primarily open-ended and focused on seven main topics to ensure flexibility in responses.

To enhance validity, an academic colleague not involved in the study served as an external auditor and provided feedback on the interview questions. The interviews were conducted

from June to September 2023 via videoconferencing to overcome constraints of time and location. Participants were encouraged to speak freely in their native language, Indonesian.

A pilot interview was conducted with one participant to test the clarity of the interview questions, the online platform, and the timing of the session. Based on the pilot, several questions were refined to ensure participants' comprehension aligned with the intended meaning. Each formal interview lasted approximately 50 minutes.

To establish rapport, the researchers began each session with self-introductions and expressed gratitude for participants' involvement. Prior to the interview, informed consent was obtained, and participants were informed of their rights. To protect confidentiality, pseudonyms were used when reporting findings. All interviews were recorded to allow accurate transcription and analysis.

2.3 Data Analysis

The analysis followed standard qualitative research procedures. Audio recordings were transcribed into text, and each transcript was labeled for systematic examination. The researchers carefully read the transcripts, highlighted key sections, and refined the data to ensure clarity and alignment with the interview questions.

Primary themes were identified by summarizing and grouping similar data into broader categories. The codes were then refined, integrated, and organized into a coherent framework for reporting.

Six main categories emerged from the data to address the research questions:

1) Basic understanding, experience, and attitudes
2) Impact of chatbots on English teaching and learning
3) Advantages and challenges of integrating chatbots
4) Sources of knowledge and skills related to chatbots
5) External support needs
6) Future professional development needs

Within these categories, 17 themes were identified. For example, the first category, "Basic understanding, experience, and attitudes," included two themes: "Pre-service teachers' understanding and experience with chatbots" (Theme 1) and "Attitudes toward chatbot use and human-bot collaboration" (Theme 2). Each theme was further divided into sub-themes. For Theme 1, the sub-themes were "Chatbots' popularity," "Chatbots' variety," "Pre-service teachers' understanding," and "Frequency of chatbot use" (See Supplemental Information for a full summary of emergent themes).

4. RESULT AND DISCUSSION

4.1 Result

4.1.1 Perceptions Regarding Chatbots in English Teaching and Learning Basic Understanding, Experience, and Attitudes

Unsurprisingly, chatbots have gained notable popularity among the participants. All participants acknowledged being aware of chatbots, reflecting their widespread recognition. When asked to list common chatbots encountered in daily life, nearly all participants

mentioned ChatGPT as the primary example. Some also cited voice assistants on mobile devices, such as Siri (iPhone) and Little Yi (Huawei), illustrating the diversity of chatbots across different platforms and applications. P12 elaborated:

> *"First, there's ChatGPT; it has different versions like 3.0, 3.5, and 4.0. Also, Siri is an Apple mobile phone with a chatbot. Similarly, there may be domestic chatbots, like Baidu developed one called ERNIE Bot, Little Yi and so on. AI chatbots are now on our mobile phones, for example, some apps can also carry AI chatbots, for example, WeChat public subscription accounts seem to have an AI oral chat study room… There are also some oral English chatbots on some apps."*

Participants demonstrated a basic understanding of chatbots' functions, often highlighting their information-gathering capabilities. For instance, P4 described:

> *"Take ChatGPT as an example. I know ChatGPT can help collect information. First, you raise a question to it, and then it will help you collect various resources online, and then help you organize. Therefore, I think the function of chatbots is to collect data first, and then organize and arrange these data to form a logical answer, and then present it."*

However, several misunderstandings were evident, primarily in the form of incomplete or outdated knowledge. Incomplete understanding was the most frequent issue: many participants described general applications of chatbots but lacked clarity on their mechanisms. P8 commented:

> *"First of all, it is a language model trained with an algorithm, which can generate natural language text and communicate according to the information of related problems provided by me. I think one of its biggest characteristics is that it uses a lot of data training, including textbooks on the Internet. But it has a disadvantage, that is, it is easier to identify, and sometimes the answer is not right."*

Conversely, delayed understanding reflected participants' conceptions lagging behind current technological advancements. For example, some participants did not recognize that modern chatbots have empathetic tones, human-like voices, and artificial visual representations:

> *"Chatbots may not convey the emotions as people, and it can be seen from the lines. The words are not so special and rich, that is, not as close as a real person when communicating with you." (P3)*
> *"In terms of spoken language, I think it is possible to design some images for chatbots, and it is best that users can design these images themselves. In this way, whether we are speaking or listening, we will have a stronger sense of presence, and it feels like we are really chatting with people." (P6)*

Some participants also expressed concerns about chatbots' efficiency and accuracy, echoing findings from Limna et al. (2023). P9 remarked:

> "*For example, when I chat with it in oral communication, it may not be able to grasp the key point I want to express at once, and the focus will be one-sided. And it may not be able to accurately identify the central meaning of what I am saying."*

Regarding frequency of use, participants' engagement with chatbots varied by grade and teaching experience. For instance, P8, a senior pre-service teacher, reported frequent use for lesson preparation, while P9, a freshman, primarily used chatbots for homework and self-learning. P11, though having used ChatGPT only once, did so to generate a writing sample for teaching purposes, highlighting early awareness of its pedagogical potential.

Attitudes toward chatbots were overwhelmingly positive. Almost all participants (N = 11) expressed strong support for integrating chatbots into English teaching and learning, consistent with Tlili et al. (2023). Nevertheless, all participants rejected the idea of chatbots substituting human teachers, citing essential human traits such as moral education, diverse teaching methods, and emotional support:

> Moral Education: *"Chatbot has no educational function, and it is difficult to guide students with the correct values." (P2)*
>
> Teaching Methods: *"The role of human teachers is not only to pass on knowledge but also to enlighten students on problem-solving. Chatbots can only tell students the answer." (P3)*
>
> Emotional Support: *"Chatbots are unable to empathize with people or detect students' psychological changes through their micro-expressions." (P4)*

Participants also emphasized the necessity of human-bot collaboration, proposing feasible division of labor and application scenarios:

> Division of labor: *Chatbots can handle mechanical tasks (e.g., data collection), while humans manage experiential and creative tasks. (P1)*
>
> Process sequencing: *Chatbots provide essential information first, with human teachers adjusting instruction based on student needs. (P4)*
>
> Training needs: *"I will learn more about chatbot theory. I hope schools provide training, and students and parents understand human-bot collaboration." (P11)*

4.1.2 Impact of Chatbots on English Teaching and Learning

Participants highlighted the potential impact of chatbots across seven English skills: listening, speaking, reading, writing, vocabulary, grammar, and comprehensive skills. Key findings include:

1) Listening and Speaking: Chatbots can improve conversational skills and reduce shyness (N = 8), consistent with N. Y. Kim (2018a) and Muhammad et al. (2020).
2) Reading: Chatbots assist in selecting reading materials and improving comprehension, supporting Liu et al. (2022).
3) Writing: Chatbots provide resources for pre-writing and post-writing polishing (N = 10), though some participants raised concerns about dependence (N = 3) and logical constraints (N = 2), despite evidence of chatbots training students' logic (R. Zhang et al., 2023).
4) Vocabulary and Grammar: Chatbots can enhance learning, but some participants questioned the effectiveness of engaging presentation.

Overall, participants identified several advantages: accurate feedback, instant responses, personalized instruction, and a robust knowledge base (Ait Baha et al., 2023; Kuhail et al., 2023). Challenges included inappropriate feedback, pronunciation defects, student dependence, limited critical thinking, and potential lack of interest. This summary provides a clear picture of pre-service teachers' perceptions, experience, and attitudes toward chatbots, along with their insights into the potential benefits and challenges of integrating chatbots in English teaching and learning.

5. CONCLUSION

This study explored pre-service English teachers' perceptions of and needs in integrating chatbots into English teaching and learning. The findings align with previous research highlighting the potential of LLM-based tools, especially chatbots, to enhance teaching efficiency and facilitate human-bot collaboration. These results provide a foundation for discussing strategies to better implement chatbot-supported English instruction.

From the perspective of perceptions, participants showed limited and delayed understanding of chatbots, primarily acquiring knowledge and skills from online sources. Their usage frequency varied by grade level. While they expressed positive attitudes toward chatbots, they strongly believed that these tools could not replace human teachers and envisioned a future of human-bot collaboration in teaching. Regarding needs, six external supports were identified: policy, equipment, financial, practice, training, and social awareness. Additionally, participants anticipated the future development of chatbots in six key areas.

Two key implications emerge from these findings. First, raising awareness and enhancing pre-service teachers' knowledge about chatbots is essential. Given that participants mainly relied on the Internet, formal training is necessary. Training should cover chatbot nature, functions, applications, and limitations within the TPACK framework, emphasizing: TK (knowledge of various chatbots and working principles), TCK (choosing chatbots for teaching oral English), and TPACK (using chatbots in project-based learning activities, e.g., students researching an English festival, creating presentations, and presenting using digital tools). Ethical considerations, human-bot collaboration, teaching scenarios, and emergency handling should also be included to support effective integration. Moreover, external supports—including policy, equipment, financial, practice, and social awareness—should be strengthened to increase teachers' confidence in using chatbots.

Second, as AI technology evolves rapidly, chatbots must continue to improve to meet the changing needs of English teaching. Future developments should focus on enhancing language processing, oral output, humanistic care, cross-platform support, VR integration, and creating diverse specialized chatbots. Continuous investment in research and development is essential to expand their functionality and practical applications in education.

This study focused on pre-service English teachers' perceptions and needs regarding chatbot integration, offering insights into teacher education and AI-based tools in English teaching. However, limitations exist. First, the findings were based on qualitative interviews with a small sample. Future research could use mixed methods with larger samples to capture a more comprehensive view. Second, the study was cross-sectional. Given the rapid advancement of chatbot technology, longitudinal studies tracking teachers' evolving understanding would provide deeper insights.

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