


Harnessing Conversational AI in Higher Education: The Education Buddy - An Innovative Intervention for International Students Facing Study Difficulties

AI-Assisted Learning for International Students


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Abstract: As Germany anticipates a demographic shift necessitating reliance on foreign professionals, the integration of international students becomes critical. Despite being a preferred non-English speaking study destination, the country's academic environment – encompassing course materials, lectures, and organizational aspects – is predominantly German. This poses a significant language barrier for the 440,000 foreign students currently studying in Germany, potentially impeding their academic success and future professional integration. To mitigate this, we introduce the Education Buddy, a Conversational Agent (CA) designed to assist international students in navigating their studies. The Education Buddy emerges as a potentially effective tool for facilitating the successful participation of international students within the German academic system.

Keywords: Education Buddy, Conversational Agent, Digital Learning, Coach, Integration

1 Introduction

Undertaking higher education in a foreign country can be a daunting challenge, especially for international students. In Germany, there are currently 440,000 international students [ER22], and at the same time, there is a shortage of skilled workers [HA23]. In response to the shortage of skilled labor, the German Council of Economic Experts proposes that an annual influx of 1.5 million immigrants is necessary [TA23]. The country actively seeks to attract international students and professionals to contribute to its workforce and combat the skills gap [HA23]. By encouraging the integration of these students into the German job market after graduation, Germany aims to harness their knowledge and skills to bolster its industries and economic growth. However, international students, who are often not native German speakers, face several challenges in their studies [Pi18]. The German academic exchange service clusters the study difficulties of international students into nine parts: Discrepancy between

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expectations and reality, institutional heterogeneity, language problems, lack of preparation for studies and daily life, study financing, career prospects for students, administrative processes like residence permit, stress, and other emotional strains.

The Education Buddy primarily focuses on the scope of resolving the problem of students' inadequate preparation for their academic studies. The current concept for providing educational coaching to students with study difficulties in Germany relies solely on lecturers. However, this approach is not effective, particularly in large departments where there are capacity issues. This shortage of coaching can lead to lower success rates and dropouts which is a permanent issue for the society [GR2023]. Uniquely, the Education Buddy marries the human coaching approach with an Conversational Agent (CA) assistance, such a hybrid coaching approach has not been previously realized in higher education and is a scalable education technology solution. The novel approach of this idea is the hybrid collaborative coaching, in which support is provided by either a human or a CA, depending on the issue of the international student. A continuous handover takes place between the two entities, depending on which type of coaching is currently beneficial.

Our research proposes the creation and implementation of a hybrid CA system. The core objective of the project is to enrich educational coaching for international students by integrating digital elements. It is essential to identify which aspects of educational coaching can be effectively supplemented by digital offerings. Furthermore, the role of the Education Buddy in relation to lecturers needs to be defined.

For this purpose, we pose the research question:

In the realm of higher education for international students facing study difficulties because of inadequate preparation and insufficient prior knowledge, what design principles should be employed to optimize the support provided by conversational agents, in which specific tasks can they offer assistance to support traditional lecturers and how the CA will be integrated into the existing support services?

2 Theoretical Background

The latest developments in AI have opened new interactive opportunities for the support and interaction with the user [Wi22]. The advanced capabilities of AI have been instrumental in extending user support across a progressively broadening range of applications [Wi22]. Until nowadays the capabilities of such a CA as coach were limited, however due to the newest developments CA coaches can match human coaches in adult education [Te22]. CA are AI-powered software programs designed to simulate human-like conversations and interactions [GCM13]. These digital assistants provide personalized advice, support, and guidance to users in the education context [Wi20]. Their purpose extends beyond answering queries to facilitating a learning process, tailoring their interactions based on users' individual needs, preferences, and progress

over time [Wi20].

The Education Buddy is a CA designed to provide personalized assistance to international students with a lack of preparation for studies. The CA serves as the first point of contact allowing lecturers to focus on complex knowledge issues necessitating their attention. The technical design of the Education Buddy is anchored in the use of Large Language Models, particularly Natural Language Processing (NLP) techniques and transformer-based architectures like GPT.

Interaction with stakeholders is crucial in the successful implementation. The collaboration begins by engaging these stakeholders in discussions to understand their perspective and insights, thus ensuring the system is designed to meet the needs of all parties involved. The International Office would play a vital role in the integration and promotion of the Education Buddy. Student advisors would be integral in providing content and context for the Education Buddy. Exam offices would be crucial partners in supplying the CA with up-to-date information which students may struggle and need support.

3 Implications and Conclusions

In our quest for designing the Education Buddy, we endeavour to employ the Design Science Research approach [He04]. Our primary objective is to glean practical implications related to the requirements of international students and the utilization of the Buddy at German universities. In terms of practice, the Education Buddy could change the way support is provided to international students. It could significantly improve student outcomes and wellbeing, contributing to a more inclusive and supportive educational environment. On a theoretical level, our research aims to delve deeper into how conversational agents can contribute to the elevation of accessibility and inclusivity of the processes and procedures in the higher education domain. The project could contribute to our understanding of AI in education, particularly in the context of international student support. In conclusion, the development and research of the Education Buddy represents an exciting, promising venture in the field of educational technology.

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