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BRIDGING THE CULTURE GAP: CHALLENGES AND LIMITATIONS OF USING CHATBOTS IN INTERCULTURAL EDUCATION

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Abstract

Chatbots are used more frequently to improve the educational process and develop intercultural competency. However, the difficulties and restrictions of employing chatbots in intercultural education are poorly understood. This study examines the potential drawbacks and difficulties of utilising chatbots in intercultural education, including the risk that they may simplify or stereotype cultural differences and the possibility of technical difficulties obstructing successful communication. This study investigates the effects of chatbots on intercultural communication in the classroom, the use of chatbots in language learning, and the best practices for designing and implementing chatbots in intercultural education through theoretical analysis of previous research and case studies. While chatbots can personalise the learning process and help the development of intercultural competency, the study discovered that they also have essential limits that need to be considered. These findings highlight the need for culturally aware chatbot interactions and continual assessment of chatbots' efficacy in intercultural education, which have significant ramifications for academics and educators. A promising area is the use of chatbots in intercultural education. To fully realise the potential of this technology, it is imperative to solve the difficulties and constraints correctly.

Keywords: chatbots, intercultural competence, education, challenges, limitations

INTRODUCTION

An increasingly common instrument for enhancing the educational experience and promoting the growth of intercultural competency is the chatbot. However, little is known about the difficulties and restrictions of employing chatbots in intercultural education, despite their expanding use in the field. This study examines the potential drawbacks and difficulties of utilising chatbots in intercultural education, including the risk that they may simplify or stereotype cultural differences and the possibility for technical difficulties to obstruct successful communication. This study investigates the effects of chatbots on intercultural communication in the classroom, the use of chatbots in language learning, and the best practises for the design and implementation of chatbots in intercultural education through

theoretical analysis of previous research and case studies.

Background and Context:

Chatbots are a growingly common tool for boosting the learning experience as a result of the increased usage of technology in education (Bahja et al., 2020; N.-Y. Kim et al., 2019; Kohnke, 2023). Computer programmes called chatbots are made to mimic human speech (Maher et al., 2020; Suhel et al., 2020). They can provide information, respond to enquiries, and offer comments, among other educational functions. The usage of chatbots in education has exploded recently, and more and more chatbot apps are being created for use in the classroom.

Additionally, chatbots can be used by teachers to manage their classrooms and assignments more effectively, saving them time and



allowing them to concentrate on giving their pupils high-quality instruction (Kohnke, 2022). There are a plethora of potential uses for chatbots in education, and the only restrictions are the faculties of educators. As chatbot technology develops, educators and students are finding new applications for them to enhance the effectiveness, fun, and enjoyment of learning.

Problem Statement:

Despite the expanding use of chatbots in education, little is known about the difficulties and restrictions associated with their usage in intercultural education. Chatbots have the ability to personalise the educational process and aid in the growth of intercultural competency, but they also have important limitations that must be taken into account. The goal of this study is to establish best practises for the design and deployment of chatbots in intercultural education as well as to analyse potential difficulties and limitations with their use.

This study will explore the impact of chatbots on intercultural education, including the potential benefits, challenges, and limitations of using this technology in an educational context. The findings of this study will be used to inform the design and implementation of chatbots in intercultural education to ensure that the technology is used effectively and efficiently to support the development of intercultural competence. The research results will provide valuable insights into best practices for using chatbots in intercultural education, helping to maximise the effectiveness of this technology in teaching and learning.

Research Questions:

The study aims to answer the following research questions:

1. What are the potential challenges and limitations of using chatbots in intercultural education?
2. How do chatbots impact intercultural communication in the classroom?

3. How can chatbots support the development of intercultural competence by using authentic, culturally-relevant materials?
4. What are the best practices for designing and implementing chatbots in intercultural education?

Significance of the Study:

The results of this study have significant ramifications for academics and educators since they emphasise the necessity of culturally-sensitive chatbot interactions and continuing testing of chatbot performance in intercultural education. This study will help explain how chatbots are used in intercultural education and provide guidance for creating and implementing chatbot-based intercultural education programmes.

The findings of this study should be used to further investigate the use of chatbots in intercultural education, and to develop more effective chatbot-based intercultural education programs. Additionally, the information gathered can be used to guide the development of culturally-sensitive chatbots that are better equipped to interact with students from different cultures. This research should be used to create best practices for designing and deploying chatbot-based intercultural education programs and to increase understanding of the effectiveness of such programs.

The exigency of the study:

The use of chatbots in intercultural education is a promising field. However, it is essential to fully address the challenges and limitations to utilising this technology's potential. This study aims to identify these challenges and limitations and to provide practical recommendations for addressing them. It fills the gap of knowledge on this topic by providing insights into the practical implementation of chatbots in intercultural education.

The findings of this study can be used to inform the design of chatbots for intercultural education and to optimise their effectiveness



in helping learners gain intercultural competencies. Furthermore, it can provide a foundation for further research into using chatbots in intercultural education and the potential of such technology to foster global understanding. The results of this study can help educators, developers, and researchers understand how to use chatbots best to increase intercultural understanding and foster global education.

LITERATURE REVIEW

The literature review provides an overview of existing research on chatbots in education and intercultural education. It also examines the relevant literature on the challenges and limitations of using chatbots in intercultural education. The literature review is divided into two main sections: research on chatbots in education and intercultural education.

Research on Chatbots in Education:

There has been a growing interest in using chatbots in education in recent years, with several studies investigating the use of chatbots for various educational purposes, such as providing information, answering questions, and providing feedback (Bezverhny et al., 2020; Cunningham-Nelson et al., 2019; Gupta & Chen, 2022; Pérez et al., 2020; Smutny & Schreiberova, 2020). These studies have found that chatbots have the potential to enhance the learning experience and support the development of various skills, including language skills and problem-solving skills (H. Kim et al., 2022; Saengrith et al., 2022). However, there is limited research on using chatbots in intercultural education, and there is a need for further research in this area.

To better understand how chatbots can be used to support and enhance intercultural education, it is essential to investigate the various factors that may influence the effectiveness of such interventions, such as the design of the chatbot, the types of educational materials used, and the user

experience. In addition, it is essential to consider the ethical implications of using chatbots in intercultural education, such as the potential for bias and the potential impact on student learning outcomes. Therefore, it is imperative to conduct more research into using chatbots in intercultural education to ensure that these tools are used effectively and ethically.

Research on Intercultural Education:

There is a growing body of research on intercultural education, which examines the impact of culture on the learning process and the development of intercultural competence (Holliday et al., 2021; Khasanova, 2020; Savicki, 2020). Research in this area has found that intercultural education has the potential to enhance the learning experience and support the development of intercultural competence (Deardorff, 2019). However, there is limited research on using chatbots in intercultural education, and there is a need for further research in this area.

To better understand the role of chatbots in intercultural education, further research is needed on how chatbots could be used to support the development of intercultural competence, as well as how students can benefit from using these tools in their learning. Therefore, it is essential to explore how chatbots can help promote intercultural education and its goals of fostering intercultural understanding and mutual respect. This research should explore the advantages and disadvantages of using chatbots in intercultural education and the potential implications of using chatbots in the classroom.

Challenges and Limitations of Using Chatbots in Intercultural Education:

While research on chatbots in education and intercultural education has found that chatbots have the potential to enhance the learning experience, there is limited research on the challenges and limitations of using chatbots in intercultural education. Some studies have identified challenges such as the



oversimplification of cultural differences and the potential for chatbots to stereotype cultural differences. However, there is a need for further research on the challenges and limitations of using chatbots in intercultural education.

The most effective way to utilise chatbots in intercultural education is by ensuring they are programmed to represent cultural nuances and adapt to different cultural contexts accurately. Therefore, researchers need to explore ways chatbots can be programmed to accurately represent different cultures and cultural nuances to maximise their potential for use in intercultural education. It is also essential for researchers to investigate how chatbots can be used to facilitate meaningful intercultural dialogue and interactions.

This literature review shows that chatbots in education and intercultural education are emerging fields, and limited research is available. However, it has a high potential to enhance the learning experience, support the development of intercultural competence, and fill the gaps in education. However, studies highlight the challenges and limitations that must be considered in their implementation. The literature review provides a theoretical framework and the research questions that will guide this study. At the same time, it will also provide an understanding of the current state of the art and where future research should focus on.

THEORETICAL FRAMEWORK

The theoretical framework for this study is based on the impact of technology on intercultural education and the potential of chatbots in intercultural education. The theoretical framework is divided into two main sections: the impact of technology on intercultural education and the potential of chatbots in intercultural education.

Impact of Technology on Intercultural Education:

Technology has had a profound impact on education, and it has the potential to enhance the learning experience and support the development of intercultural competence (Akdere et al., 2021; Shadiev et al., 2020; Shadiev & Dang, 2022; Shadiev & Sintawati, 2020). Research in this area has found that technology-based intercultural education can potentially support the development of intercultural competence and facilitate cross-cultural exchanges and understanding. However, technology-based intercultural education also has its own challenges and limitations, and it is essential to consider these when designing and implementing technology-based intercultural education programs (Shadiev et al., 2021).

To ensure the success of technology-based intercultural education, it is essential to understand and address the specific challenges and limitations of this type of education and to ensure that it is implemented in a way that maximises its potential to support the development of intercultural competence. Additionally, it is essential to recognise the importance of teacher training, support, and guidance to implement technology-based intercultural education successfully. By providing the necessary resources and support, teachers and administrators can help ensure the successful implementation of technology-based intercultural education programs and that they promote cross-cultural exchange and understanding.

Potential of Chatbots in Intercultural Education:

Chatbots are computer programs designed to simulate human conversation, and they can personalise the learning experience and support the development of intercultural competence. Research in this area has found that chatbots have the potential to enhance the learning experience and support the development of intercultural competence, particularly in language learning. However,



there is limited research on using chatbots in intercultural education, and there is a need for further research in this area.

To better understand the potential of chatbots in intercultural education, it is essential to consider the various ways in which they can be used, such as in providing personalised instruction, facilitating conversations between students of different cultures, and assessing student learning outcomes. Research should also focus on the potential for chatbots to bridge cultural differences and foster a more inclusive learning environment. It is also essential to explore the ethical implications of using chatbots in intercultural education, such as the potential for bias and the need for safeguards to protect users' privacy.

Defining Intercultural Competence:

Intercultural competence is communicating effectively and appropriately with people from different cultural backgrounds (Deardorff, 2019; Irwin, 2020). It is a complex and multi-faceted construct that includes cognitive, affective, and behavioural components. Intercultural competence is essential for effective communication and interaction in today's globalised world.

To build intercultural competence, individuals need to gain knowledge and understanding of the different cultural norms, values, and practices. They must also practice respect, empathy, and openness to new perspectives. Through this process, individuals can develop the skills and attitudes required to navigate intercultural interactions successfully and respectfully. With the right skills and attitudes, individuals can become more culturally aware and understanding, leading to more successful and positive intercultural experiences.

Best Practices for the design and Implementation of Chatbots in Intercultural Education:

Chatbots need to be designed and implemented to effectively support

intercultural education, considering cultural nuances, language capabilities and ethical aspects such as data protection and privacy. Best practices for designing and implementing chatbots in intercultural education include using authentic, culturally-relevant materials and guidelines for creating culturally-sensitive chatbot interactions.

Additionally, considerations such as language support for diverse cultures and appropriate language should be considered when designing and implementing chatbots for intercultural education. A clear understanding of the target audience and their cultural context is essential for successfully implementing chatbots for intercultural education. The use of machine learning and natural language processing techniques can also be beneficial to provide a more personalised and engaging user experience for intercultural education.

Challenges and Limitations of Using Chatbots in Intercultural Education:

Several challenges and limitations must be considered when using chatbots in intercultural education, such as the potential for chatbots to oversimplify or stereotype cultural differences and technical issues to impede effective communication. Other challenges include chatbots' insensitivity to cultural norms and values, limited language capabilities, and ethical concerns such as data protection and privacy. These challenges must be considered when designing and implementing chatbots in intercultural education to ensure they are effective and culturally sensitive.

To ensure effective and culturally sensitive implementation of chatbots in intercultural education, it is essential to consider the use of additional strategies such as human-mediated interactions, content moderation, and user training. These strategies should be tailored to the specific cultural context and adapted as needed to ensure that chatbot interactions are meaningful and respectful. By considering the challenges and limitations associated with



using chatbots in intercultural education, educators can create a thriving learning environment that is both effective and culturally sensitive.

In summary, the theoretical framework of this study provides a broad understanding of the impact of technology on intercultural education and the potential of chatbots in intercultural education. It also provides a clear definition of intercultural competence, best practices for designing and implementing chatbots in intercultural education, and the current challenges and limitations of using chatbots in intercultural education.

METHODOLOGY

The methodology section of this study describes the research design, data collection and analysis methods used to explore the potential challenges and limitations of using chatbots in intercultural education. This study uses a theoretical analysis approach, which involves a review of existing literature and case studies, to identify the challenges and limitations of using chatbots in intercultural education.

Research Design:

The research design used in this study is a theoretical analysis, which involves a review of existing literature and case studies (Singh & Miah, 2020). The theoretical analysis approach was chosen because it allows for an in-depth examination of the challenges and limitations of using chatbots in intercultural education. It does not need real classroom experiments as this is theoretical research.

Data Collection:

The data for this study were collected from a review of existing literature and case studies, which were identified through a systematic search of academic databases such as JSTOR, EBSCOhost, ProQuest and Google Scholar. Keywords such as "chatbots in education", "intercultural education", "challenges", "limitations" and "best practices" were used to

identify relevant literature and case studies. The data collected includes articles, research studies, and reports published in English and the field of education technology.

Data Analysis:

The data collected were analysed using a thematic analysis approach (Alhojailan & Ibrahim, 2012). Thematic analysis is a method for identifying patterns or themes within a dataset, and it involves coding and categorising data according to relevant themes. The data were analysed to identify the potential challenges and limitations of using chatbots in intercultural education and to identify best practices for the design and implementation of chatbots in intercultural education.

Ethical Considerations:

This study has complied with academic ethical principles of respect for persons, beneficence, and non-maleficence. To protect participant privacy, no personal data was collected. No data will be shared or published in any form that would enable others to identify any participant.

This study employed a theoretical analysis approach which allows for an in-depth examination of the challenges and limitations of using chatbots in intercultural education. The data were collected through a systematic search of academic databases and analysed using a thematic analysis approach. This methodology allows for an understanding of the challenges and limitations of using chatbots in intercultural education, and it is a valid method for this type of theoretical research.

RESULTS AND ANALYSIS

This section presents the results of the data analysis and provides an in-depth examination of the challenges and limitations of using chatbots in intercultural education. It also discusses the implications of the findings and identifies best practices for designing and



implementing chatbots in intercultural education.

Challenges in Chatbot Design:

One of the main challenges of using chatbots in intercultural education is creating chatbots that can effectively communicate and interact with people from different cultural backgrounds. For example, chatbot interactions that may be appropriate in one culture may be viewed as inappropriate or offensive in another culture. This can lead to confusion and frustration for users and impede effective communication.

To address this issue, it is essential to ensure that chatbot designers are aware of cultural sensitivities and have access to cultural resources to create chatbots that can interact effectively with people from any culture. Additionally, the chatbot's language should be adapted to fit the culture of the intended user, including dialects and terms specific to that culture. Furthermore, users should be able to customise their chatbot interactions to meet their needs and preferences. This could include options for users to select their language or cultural preferences for their chatbot interactions.

Limitations in Language Capabilities:

Another challenge of using chatbots in intercultural education is the limited language capabilities of many chatbots. Many chatbots can only communicate in a single language, which can limit their effectiveness in intercultural education. Even in the case of multilingual chatbots, there is often a lack of fluency in specific languages or cultures, leading to a difficulty understanding or responding appropriately.

This can be particularly problematic when dealing with more complex topics related to culture, such as history or politics, as the chatbot may not have the necessary language capabilities to provide accurate and appropriate responses. In order to ensure that chatbots can communicate across cultures effectively, they must be equipped with

accurate and up-to-date knowledge of the language and culture of their target audiences. As such, chatbot developers must take the time to properly research and develop language capabilities for their chatbots to ensure they can effectively communicate across cultures.

Oversimplification of Cultural Differences:

Another challenge of using chatbots in intercultural education is the potential for chatbots to oversimplify or stereotype cultural differences. For example, a chatbot that provides information about a particular culture may only present a limited and stereotypical view of that culture, which can lead to misunderstandings and misconceptions.

It is important to note that cultural diversity is much more complex than a chatbot can accurately represent. Thus it is essential to provide additional resources and information to users to give them a more comprehensive understanding of the culture. By doing so, users can gain a better and more nuanced understanding of cultural differences and the complexities of intercultural dialogue. Furthermore, it is also essential to create chatbot content that is culturally sensitive and respectful in order to avoid any potential for offence.

Technical Challenges:

Another challenge of using chatbots in intercultural education is the potential for technical issues to impede effective communication. Technical difficulties such as connection issues or chatbot malfunction can disrupt communication and impede learning (Fryer et al., 2019). This can be particularly challenging in intercultural education, where effective communication is essential for building cross-cultural understanding.

It is important to be aware of these potential issues and have a plan to address them to ensure a successful learning experience. Having a backup plan in case of technical issues can prove to be invaluable in any



intercultural education setting. Having a plan to troubleshoot technical issues and contingency plans in place will help to ensure that any disruptions to communication and learning are minimised. Therefore, it is important to be prepared to address technical issues quickly and effectively to ensure a positive learning experience.

Ethical Challenges:

The use of chatbots in intercultural education also raises several ethical issues. For example, chatbots collect and process personal data, which raises concerns about data protection and privacy. Additionally, chatbots may perpetuate stereotypes or bias, which can harm marginalised groups. To ensure that chatbots are used ethically in intercultural education, it is important to consider these issues and design chatbot interactions that are culturally sensitive and protect user privacy.

To this end, developing and implementing ethical guidelines for using chatbots in intercultural education can help ensure that they are used safely and responsibly. Moreover, it is essential to continually monitor chatbot interactions in order to identify and address any ethical issues that may arise. Furthermore, providing training and resources to educators and students on the ethical implications of using chatbots can help safeguard against any misuse or abuse of the technology. It is also important to maintain a clear understanding of the limitations of chatbot technology, so that their use is not overstated or exaggerated in order to avoid any unrealistic expectations or promises.

Best Practices for Chatbot Design:

In order to effectively support intercultural education, chatbots need to be designed and implemented with consideration of cultural nuances, language capabilities and ethical aspects. The literature review shows some best practices such as using authentic, culturally-relevant materials and creating culturally-sensitive chatbot interactions. These best practices can help to ensure that

chatbots are effective and appropriate for intercultural education.

To further optimise the chatbot design, it is also important to plan for continuous monitoring, evaluation and improvement of the chatbot's performance to ensure that it is delivering the best possible outcomes for intercultural education. To ensure the success of a chatbot in supporting intercultural education, it is important to have a well-defined strategy that considers the best practices for chatbot design, as well as continuous monitoring, evaluation and improvement. Once the chatbot is implemented, it is important to assess its effectiveness in meeting the goals of intercultural education and make necessary adjustments as needed. By following these best practices and incorporating a robust strategy for monitoring and evaluation, organisations can ensure that their chatbots are successful in supporting intercultural education.

Best practices for language learning:

In the field of language learning, chatbots can be designed to provide personalised feedback and interact with learners in a way that mimics real-life interactions. This can help learners practice their language skills and improve their fluency. Chatbots can also provide language learning materials such as exercises, quizzes and videos, which can help learners to improve their language skills (Huang et al., 2022; Kohnke, 2022; Ruan et al., 2019).

Additionally, language learning chatbots can use artificial intelligence to track and analyse learner progress and make suggestions for improvement based on the learner's individual needs. With the help of language learning chatbots, learners can have access to personalised and targeted language learning resources, allowing them to progress more quickly and effectively, and reach their language goals. By leveraging the range of language learning resources provided by chatbots, learners can gain the confidence and skills to communicate fluently in the language



of their choice. By utilising language learning chatbots, learners can gain the necessary skills to become proficient in their chosen language.

Challenges and Limitations in Educational settings:

Chatbots have the potential to provide personalised learning experiences, which can be particularly beneficial in intercultural education, where learners come from diverse backgrounds and have different needs. However, chatbots are not a silver bullet and are not appropriate for all educational contexts. For example, if a class is too large, the chatbot can not provide the same level of personalisation as a human teacher can.

In addition, chatbots may be unable to respond to complex questions in the same manner that a human could. Thus, it is essential to consider the educational setting's learning objectives and context before deciding to use a chatbot. An essential factor to consider when deciding to use a chatbot is the technical infrastructure and resources available, as well as the instructor's level of expertise. Furthermore, it is important to assess the readiness of the students to use a chatbot, as well as the potential for them to be overwhelmed by the technology and its capabilities.

In summary, this study found that chatbots have the potential to positively impact intercultural communication in the classroom, and support language learning through the use of authentic, culturally-relevant materials. However, it also identified a number of challenges and limitations to the use of chatbots in intercultural education, including the difficulty of creating chatbots that can effectively communicate and interact with people from different cultural backgrounds, limitations in language capabilities, oversimplification of cultural differences, technical challenges, and ethical concerns. The study also highlights best practices for the design and implementation of chatbots in intercultural education, which can help overcome these challenges and limitations.

CONCLUSION

This study has examined the potential challenges and limitations of using chatbots in intercultural education, and it has identified best practices for the design and implementation of chatbots in intercultural education. The study found that chatbots have the potential to positively impact intercultural communication in the classroom, and support language learning through the use of authentic, culturally-relevant materials. However, it also identified a number of challenges and limitations to the use of chatbots in intercultural education, including the difficulty of creating chatbots that can effectively communicate and interact with people from different cultural backgrounds, limitations in language capabilities, oversimplification of cultural differences, technical challenges, and ethical concerns.

This research provides an important contribution to the field of educational technology by highlighting the importance of considering intercultural competence and best practices for chatbot design and implementation when using chatbots in intercultural education. This study also encourages future research to investigate the use of chatbots in intercultural education, to investigate further on the challenges, limitations and best practices, and to investigate the potential of chatbots to support the development of intercultural competence.

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