


Chapter 5

Opportunities and Challenges in Educational Chatbots

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ABSTRACT

The rapid technological developments have revolutionised approaches toward learning. The adoption of eLearning technologies such as chatbots has been increasing in the past few years, as there are various opportunities that can be identified to integrate educational chatbots with online learning process. For example, chatbots in education can provide various services such as personal tutoring, personal support, assessment and evaluation, etc. Issues in remote learning—such as real-time assistance, feedback, and support—can be addressed by deploying educational chatbots. Yet, there are various challenges associated with chatbot technologies in education, e.g., novelty effect, cognitive load, the readiness of students and teachers, etc. This study reviews the various opportunities and challenges associated with educational chatbots in learning. These findings would help future researchers and designers to identify the core functionality and design aspects of educational chatbots, and also aids future research by the recommendations of research propositions.

INTRODUCTION

Chatbots are software applications, which are used for automating conversations

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or interactions through messaging platforms. The conversations can be modeled through text or speech or a combination of both with a human agent. The main purpose of chatbots or conversational agents is to reduce human interventions to minimize costs by providing automated conversations to address the queries of users in different fields. Chatbot (ELIZA) was first created in 1966 at MIT to mimic human conversation for engaging patients in psychotherapy clinical treatment (Shawar & Atwell, 2007). Eliza was designed using keyword spotting and pattern matching algorithm for selecting the appropriate responses from a pre-defined set, in response to the inputs from the patients. Since then, more advanced chatbots were developed such as Parry, Alice for facilitating human-like conversations in various contexts (Yadav et al., 2019). With the advances in artificial intelligence (AI) and machine learning (ML) technologies, the use of chatbots has gained momentum, especially in the commercial sector. Chatbots are used for various purposes, such as facilitating healthcare education (Yadav et al., 2019), managing team events (Slack, 2022), weather updates (Kik, 2022), customer service (Chatbotguide, 2022), etc.

Nowdays, chatbots can be identified among all digital platforms and social media applications. In addition, conversational applications such as Google Home, and Amazon Alexa are specifically designed not only to address any queries raised by the users but also to perform various tasks such as switching on fans/lights, playing music, and searching for information from the internet. Facebook, for instance, launched its bot development platform for developers in 2016, which recorded over 30,000 chatbot applications within a year of launch (Lunden, 2016), and currently recorded over 300,000 chatbots (Hutchinson, 2019). Due to their socialization feature, chatbots come with the added advantage of making their presence in various contexts and come with various opportunities. For instance, the Mitsuku chatbot in China has got popular which is designed to entertain users by telling stories, jokes, or by playing songs (Mims, 2014). Similarly, the Microsoft Xiaoice chatbot has gained popularity for its unique feature of entertaining users according to their mood cues (Hornigold, 2019).

Chatbot technology is rapidly developing in line with the technologies that can support chatbots. Firstly, the underlying technologies of chatbots, which include AI, ML, and natural language processing. Chatbots can be divided into two categories. In the first category, chatbots function on a pre-set script, where users can respond by selecting the buttons, instead of voice/texts. These types of chatbots are easy to implement, and can still have a major impact on service delivery. The second category of chatbots are intelligent bots that can learn over time and uses advanced technologies such as AI, ML, and NLP. Integrating these technologies can have various advantages such as AI-enables can sell leads to boost revenue, as they automatically take customers through the sales funnel based on their needs and mood; delight them with a new high-tech experience; reduce customer support

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