

Journal of Advances in Mathematical & Computational Sciences
An International Pan-African Multidisciplinary Journal of the SMART Research Group
International Centre for IT & Development (ICITD) USA
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Deploying Artificial Intelligence in Service Delivery in Educational Institutions

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ABSTRACT

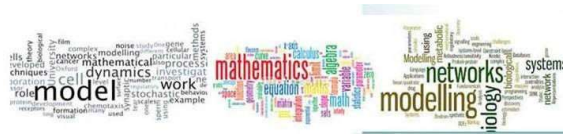
The introduction of Artificial Intelligence technology enables the integration of Chatbot systems into various aspects of education. This technology is increasingly being used for educational purposes. Chatbot technology has the potential to provide quick and personalized services to everyone in the sector, including institutional employees and students. This paper presents a systematic review of previous studies on the use of Chatbots in education.

Keywords: Deployment, Artificial Intelligence, Service Delivery, Educational Institutions

Onwodi, G. (2022): Deploying Artificial Intelligence In Service Delivery In Educational Institution. *Journal of Advances in Mathematical & Computational Science*. Vol. 10, No. 3. Pp 75-82. [dx.doi.org/10.22624/AIMS/MATHS/V10N2P6](https://doi.org/10.22624/AIMS/MATHS/V10N2P6)
Available online at www.isteam.net/mathematics-computationaljournal.

1. INTRODUCTION

The use of Artificial Intelligence (AI) in education is rapidly expanding (Roos, 2018). One of the most popular AI technologies used to support teaching and learning activities is the Chatbot system (Okonkwo & Ade-Ibijola, 2020). Chatbots are being considered as a useful technology to facilitate learning within the educational context (Clarizia et al., 2018). In this Fourth Industrial Revolution (4IR) era, educators can administer teaching either through the classroom platform or through an online platform using various technological tools such as Chatbot systems (Mendoza et al., 2020). This research looks at an online educational platform where students can learn using Chatbot technology. The use of chatbot technology in education is one of the most important approaches to enhancing and promoting a more personalized learning experience (Cunningham-Nelson et al., 2019).



Chatbots are conversational or interactive agents that provide instant response to the user (Okonkwo & Ade-Ibijola, 2020; Smutny & Schrei-berova, 2020). Chatbots are increasingly being used to improve student interaction in this current world of technology where communication and many other activities rely heavily on online platform. Most students in higher education own a smartphone, making them frequent users of internet applications. Chatbot systems can be deployed as mobile web applications to aid in learning. Chatbots can instantly provide students with standardized details, such as course contents (Cunningham-Nelson et al., 2019), practice questions and answers Sinha et al. (2020); Ranoliya et al. (2017), evaluation criteria (Benotti et al., 2017; Durall & Kapros, 2020), assignment due dates, advice (Ismail & Ade-Ibijola, 2019), campus path direction (Mabunda & Ade-Ibijola, 2019), and study materials. These systems can not only improve student engagement and support, but they can also greatly lessen lecturers' administrative workload, allowing them to focus on curriculum development and research (Cunningham-Nelson et al., 2019).

2. RELATED LITERATURE

2.1 Chatbot in Education

Although there are many ways to interact in education, such as email communication, student-to-student interaction, and student-to-lecturer interaction, none of these can facilitate individualized learning experiences that are more convenient for students. Chatbot technology can provide students with a more personalized and engaging learning environment (Benotti et al., 2017; Cunningham-Nelson et al., 2019, pp. 299–306).

Several studies have been carried out on Chatbot technology mostly on the use of Chatbot systems for educational purposes, including Chatbots used for answering students' questions (Clarizia et al., 2018, Ranoliya et al., 2017; Sinha et al., 2020), learning how to understand Computer Programming concepts (Okonkwo & Ade-Ibijola, 2020; Pham et al., 2018; Zhao et al., 2020), providing assessment of students' performance abilities (Benotti et al., 2017; Durall & Kapros, 2020), and providing administrative services (Hien et al., 2018, pp. 69–76; Rohrig & Heß, 2019). Moreover, prior research works have used literature reviews to make limited

2.2 Chatbot System

A Chatbot is an intelligent agent capable of interacting with a user to answer a series of questions and provide the appropriate response (Clarizia et al., 2018). A Computer program that mimics and processes human communication, enabling people to interact with the various Chatbot platforms, as well as the degree of creativity and usefulness of existing Chatbots.

3. CHATBOT IN EDUCATION DESIGN AND ARCHITECTURE

3.1. Planning

The applications of Chatbot technology in education is on the rise. Studies have proposed, developed, and applied Chatbot systems in education (Augello et al., 2016; Clarizia et al., 2018; Okonkwo & Ade-Ibijola, 2020). It is therefore imperative to provide the reader with a wide range of knowledge on the applications of Chatbot in education including the state of art of the Chatbot technology in education, various aspect of educational domain where the technology has been applied, advantages of using Chatbots in education, and the challenges that faces Chatbot technology implementation in education.

3.2 Information source

Needed relevant literature on the topic under study from appropriate articles, so the following digital databases were searched:

1. IEEE Digital Library
2. ScienceDirect
3. SpringerLink
4. Scopus
5. Taylor and Francis
6. ERIC

3.3. Search procedure

to be appropriate for the search based include SLRs and other related research on Chatbot applications in education. These keywords are: Chatbots in education, Chatbot for teaching, and Chatbot for learning, Conversational agents, and Intelligent systems. Manual and automatic search approaches were applied. With manual approach, we search references of related papers and automatic search was used to search the digital libraries of the selected databases (IEEE, Scopus, Springer- Link, ScienceDirect, Taylor and Francis, and ERIC) for all articles related to the topic under study.

3.4. Conducting the review

3.4.1. Search syntax

The search could be based on the title, abstract, and keywords (TITLE- ABS- KEY). The defined search words were combined in various ways to search for the appropriate articles in the selected databases. The search follows the order of AND and OR operators' processes. In AND operator, all search syntax or keywords must be present while in the OR operator, either of the search syntax must be present. The review sought to locate all related papers, Journal articles, and Conference proceedings published in English between. The same search syntax could be used to search all the databases and these syntax or keywords are as follows: (Chatbot* OR Conversational Agent*) AND (education* OR teaching OR learning OR student* OR school*)

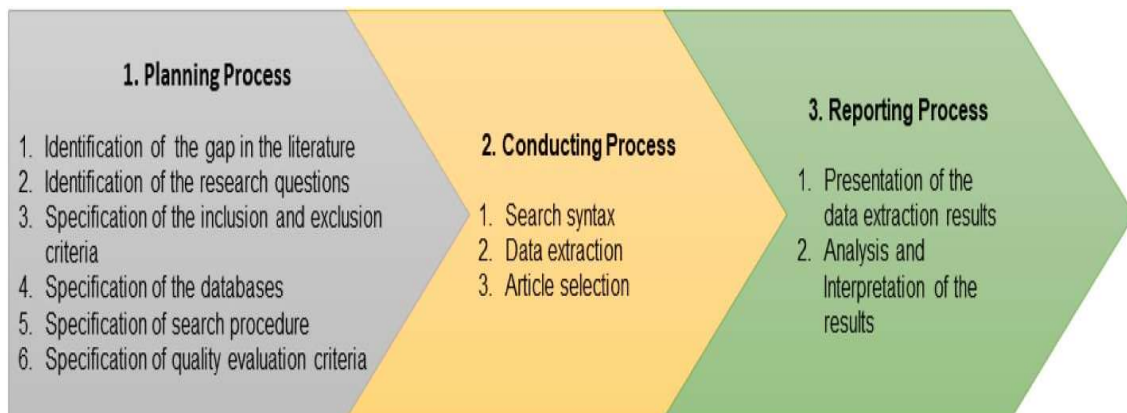


Fig. 2. Research Processes (Source: Authors-compilation).



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