

## ENHANCING TEACHING LEARNING PROCESS USING VIRTUAL AGENTS

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### ABSTRACT

Chatbot is one of the important features of Artificial Intelligence technology which is very popular nowadays and getting used for various purposes. It is being used in educational institutions also. Chatbots are usually integrated with the institution's website and used by administrative staff and students. Both of them can benefit from this technology to deliver and receive quick responses. This technology can be efficiently used by teachers and students also for academic related conversation. Chatbots can handle multiple students at once while also ensuring availability, reliability, and accessibility 24 hours a day, seven days a week. For nontechnical teachers, it is difficult to create a chatbot as per their requirements. But if it can create without writing any code, it becomes easy task and teachers can use the chatbots efficiently and effectively for their daily basis activities which will reduce their load and saves time utilized in administrative and repetitive tasks. This paper presents the necessity for the adoption of this technology, the process of its development, integration with MS Teams, and the assessment of its usefulness.

**Keywords:** chatbot, virtual agent, artificial intelligence, learning management systems, machine learning.

### Introduction

All over the world, online education has expanded its roots during the Covid19 pandemic. All corporate offices, markets, and educational institutes were closed due to lockdown. The people were facing a lot of difficulties related to their health problems and earnings. The economic growth of the countries slowed down, but still the teaching and learning process was on top priority. The educational institutes are dependent on online education. It has its advantages and disadvantages. The Covid19 pandemic forces the teachers to learn new technologies to deliver the lectures and students to get used to online education. Electronic gadgets and internet connectivity are the basic requirements of the online education model. The utilization of platforms like Google Meet and Microsoft Teams in online education is quite beneficial in the teaching and learning process. Many significant functionalities are supported by these platforms, including document storing and sharing, online meetings, screen sharing, and chat functions, among others. Many studies have been undertaken on students' learning experiences with Microsoft Teams, and students have reported minimal support from their professors and classmates, as well as low engagement in MS Teams-adopted course activities (Bezverhny et al., 2020).. Here, AI plays a key role in supporting and assisting online education by adding virtual agents or chatbots into educational establishments' learning management systems. Chatbots are conversational or interactive agents that respond to the user immediately. In today's technological environment, when communication and many other activities rely largely on online platforms, chatbots are increasingly being employed to promote student connection. The majority of students in higher education own a smartphone, which means they utilize internet applications frequently. To aid in learning, chatbot systems can be deployed as mobile web applications. Chatbots can give students standardized information such as course content, practice questions and answers, evaluation criteria, assignment due dates, advice, campus path direction, and study materials in real-time. These technologies can boost student participation and assistance while also reducing professors' administrative workload, allowing them to concentrate on curriculum creation and research (Okonkwo & Ade-Ibijola, 2021).. Information gaps can be filled with effective and frequent communication with students. When face to face student-teacher interaction is not possible, a chatbot can aid (Diachenko & Morgunov, 2019). In this paper, we proposed to add new functionality of virtual agents or chatbots in MS Teams which can help the students and teachers as well in teaching and learning.

### Literature Review

Bezverhny (2020) in his study found that the use of learning management systems can improve the effectiveness of the educational process in and of itself, but the addition of chatbots takes it to a whole new level. This will boost user involvement in the process, help it run more smoothly, and allow for more engaging learning.

Bii(2013) conducts a study to introduce the students to chatbots and found that collaboration, interaction, active learning, constructive learning, creative learning, and social learning are all benefits of their use in the classroom

ingredients necessary to enable scholars to prepare for a future that requires 21st-century competencies. Therefore it's a step in the right direction to introduce students to using chatbots in their educational procedures.

In the study conducted by Cunningham-Nelson (2019) and noted that chatbots appear to be a promising field for future educational applications. Chatbots offer the ability to personalize and streamline aspects of teaching. The two early examples demonstrate that a FAQ and a quick response are both useful. Chatbots could improve student learning and educator material delivery in a variety of ways.

Tamayo (2020) found in his study that by their very nature, chatbot models like EconBot have problems that must be addressed. It does not, for example, allow students to customize their learning beyond the available feedback options. It also makes it impossible for us to provide contextualized responses. Limitations that could be overcome with proper programming from the start, carried out by experts. It appears that a department dedicated to technological development, working in collaboration with teachers who are experts in the design and execution of such tools, is required. It appears that a department devoted to technological advancement, working in collaboration with teachers who are experts in the design and execution of such tools, is required.

In the study conducted by Mekni (2020), it was found that integrating the Minnesota State Chatbot system with a Learning Management System could be intriguing (LMS). Faculty use a learning management system (LMS) to provide curriculum, track student involvement, and evaluate student performance. Students can also utilize it to review course materials, policies, deliver tasks, and checkmarks. This chatbot system would be useful to help identify a set of at-risk indicators, including consistently late assignments, technology challenges, lack of login activity, and more.

Brindha (2019) conducted a study and found that digital assistants are required in education to manage statistics and analytics of educational databases, which include student activity monitoring, result analysis, student and faculty profiles, academic calendar events, and so on. When the digital assistant is launched, it will be a lot easier and more efficient

Clarizia (2018) found in his study that A real-world case study on the creation of a chatbot for students taking Fundamentals of Computer Science and Computer Networks courses was conducted. The problems with the experimental crusade are acceptable and show the effectiveness of this tactic.

Hien(2018) found in his study that chatbots increase customer satisfaction by shortening response times, being accessible around-the-clock, handling many conversations at once, automating repetitive tasks, and supporting multiple languages.

Kasthuri & Balaji (2021) found that the chatbot can improve the practical performance of e learner without human interference by correctly answering the questions asked by the students. Kowsher (2019) conducted a study and found that it is challenging work to create an accurate knowledge base chatbot. The chatbot was implemented for conversation with the users using pattern matching algorithm which improve its performance measure by learning from the interaction

Neto & Justiniano (2019) said that it is crucial that it be more focused on knowledge construction than teaching and learning procedures. It is important to keep in mind that the creation of the educational chatbots necessitates the involvement and preparation of educators for a cutting-edge pedagogical strategy that permits its appropriation, bringing artificial intelligence (AI) closer to the educational practice.

Heryandi (2020) found that it is difficult to assist students in the early stages for assessing their level of knowledge and discover any gaps in their learning. Teachers can give their students a variety of opportunities to share their comments, such as during conversations, short questions for group projects, feedback for both incorrect and correct answers in MCQs, and forum discussions.

### Objective of the Study

1. To study the working of virtual agents.
2. To study and understand the working of chatbots.
3. To create and integrate the chatbot with MS-Teams using virtual agents for education purposes.

### Virtual Agent

A Chatbot is a software (machine) that converse with a user (human): it is a virtual assistant which answers user questions with correct responses. A virtual agent also called an intelligent virtual agent chatbot) is a software

program that uses scripted rules and, increasingly, artificial intelligence applications to provide automated service or guidance to humans. Virtual agents are generally used to answer routine customer queries, fulfill standard requests, and/or handle simple problems in their customer service operations by organizations. For example, virtual agents are often used for initial customer interactions with call centers or click-to-chat features on websites.

Several businesses also use virtual agents to handle requests from staff members. For instance, virtual agents are frequently used within the IT department to deliver desktop help services, such as employee requests for password resets. They can also be used in businesses to instruct staff members on how to carry out activities or procedures or to answer questions about the organization's ERP systems. There are many chatbots with a higher relevance in education, research, and many others.

### **Motivation**

In Today's era of technology, most of the ways of communication and related activities are online platforms. Students who are using online learning may need to contact their teacher which is not possible as per comfort. If this process gets automated and chatbot could be used, students could be provided with answers to their generalized queries, such as various schedules, question paper template, evaluation criteria, practice questions and answers, and some doubts related to the respective subjects.

Although there are various means to communicate in education, including email, student-to-student engagement, and student-teacher communication, none of them can help students feel confident in themselves. Students may benefit from a personalized and appealing learning environment thanks to chatbot technology. In the context of education, chatbots are viewed as a beneficial technological tool to support learning. Chatbot technology has the potential to provide fast and personalized services to everyone in the industry, including institutional staff and students.

A chatbot is an interactive agent because the user receives an instant response. Chatbot not only helps students using it for the above-mentioned purposes but also helps the faculty in administrative work which is quite time-consuming (Okonkwo & Ade-Ibijola, 2021).

While pursuing online education students learn many courses in a semester. For each course, a separate Team has been created and used by the respective course instructor. It has been noticed that the students asked similar types of doubts repetitively like exam dates, assignment submission dates, queries related to the course contents, etc. These student queries vary from course to course and need to be handled separately by respective course instructors. This problem motivates us to build a separate chatbot for each course using MS-Teams virtual agent.

Microsoft Power Virtual Agent is a no-code tool. It provides a graphical interface platform to build intelligent assistants. The technology used in virtual agents efficiently manages conversations using natural language processing and machine learning. The user need not have any programming skills. So, it is convenient for non-technical instructors as it is easy to implement which can reduce their administrative workload remarkably.

### **ChatBots Implementation Via Ms-Power Virtual Agent**

The queries related to all courses cannot be handled by a single chatbot, so it is required to have a separate chatbot for each course which is possible by adding MS-Power Virtual Agent in MS-Teams. The MS-Power Virtual Agent helps to create as many chatbots without putting much effort into coding. A specific Team needs to be selected for which chatbot is to be built. The MS-Power Virtual Agent enables the creation of a chatbot in a specific language that can be selected from the given set of options. As per the requirement set of predicted queries of students and their answers can be added and deleted easily at any point in time.

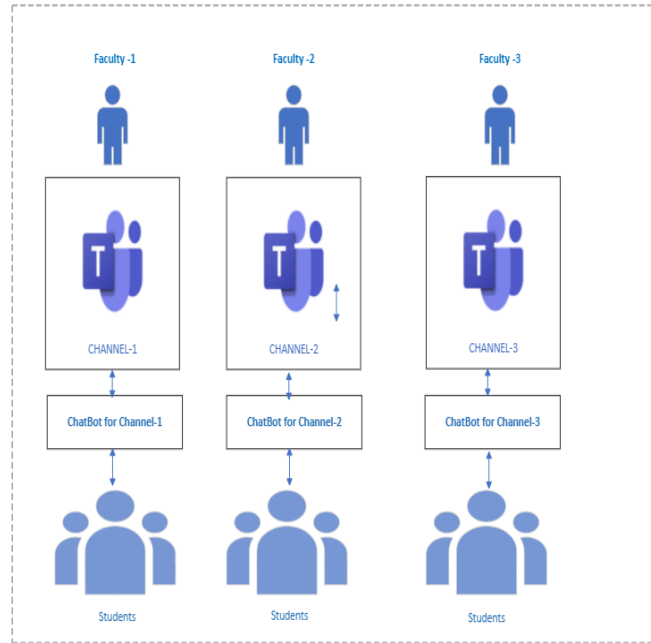


Figure 1: Chatbot Implementation Model (Source: Compiled by Researcher)

This approach has been implemented by building a chatbot for one subject named “Artificial Intelligence and Machine Learning” which is a part of a student’s curriculum. Following are some screenshots of the implemented chatbot.

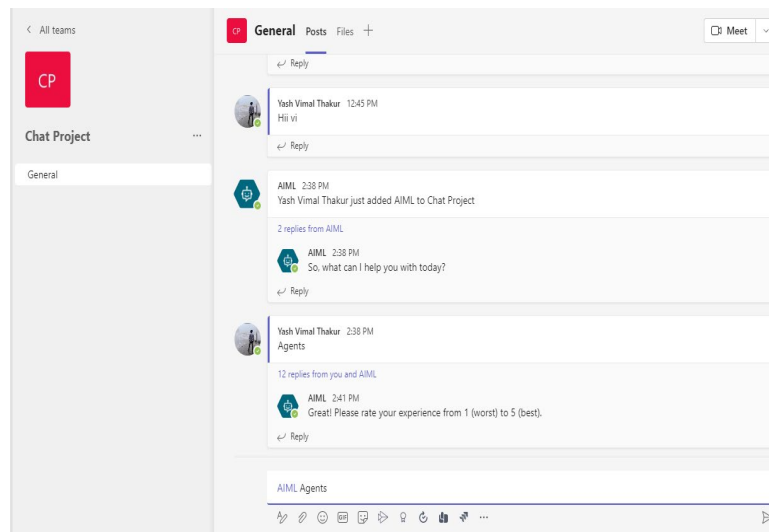


Figure 2 Created Chatbot for AIML (Source: Compiled by Researcher)

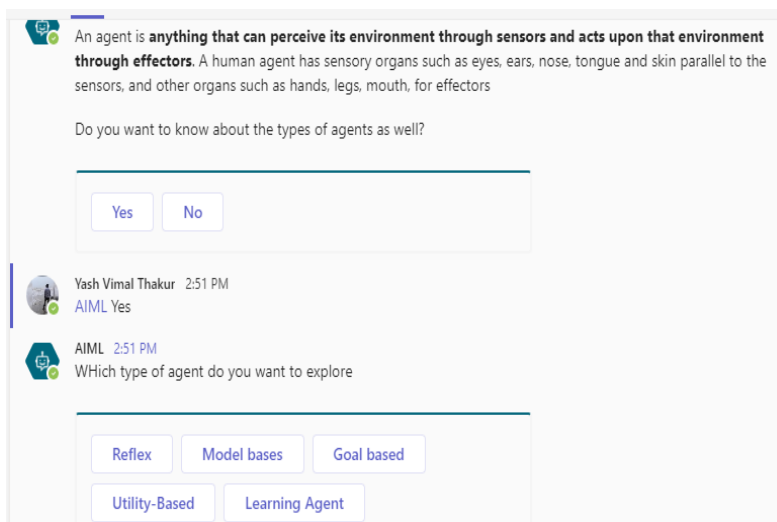


Figure 3 Student asking Query (Source: Compiled by Researcher)

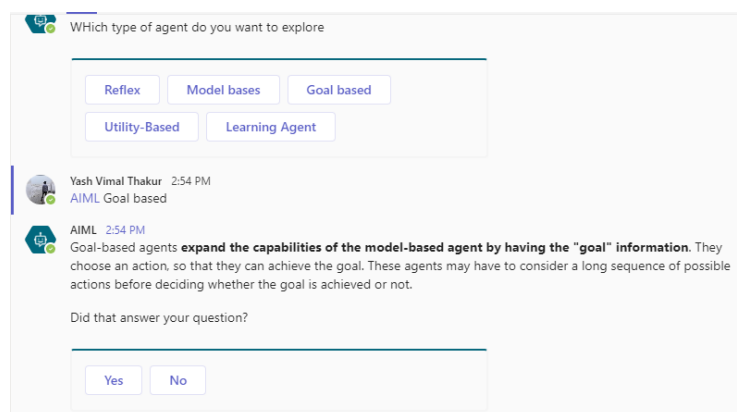


Figure 4 Chatbot giving response to student(Source: Compiled by Researcher)

## Conclusion

This approach proposed integration of chatbot via MS-Power virtual agents with MS-Teams making the task of professors and students easy. The students can get a quick response to their queries and at the same time, professors can easily rely on chatbots for some repetitive tasks which can increase their efficiency. It helps in the continuous learning process of students due to ease of access, accessibility, and relevance of information even during their vacations. Chatbots provide a user-friendly environment for the students to get the right information at the right time. The chatbots can be implemented effortlessly via MS-Power virtual agents by the professors as per their requirements.

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