Review on Mentoring Chatbot

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Abstract

Mentoring can provide valuable support for students at critical points in their academic as well as personal life. Students need mentors to assist them in the areas where they need to improve**,** to stimulate their personal and professional growth*. In standard forms of educational mentoring, students schedule appointments with their assigned mentor, a professor who very well knows the academic curriculum and potential trajectories students goes through. However it is necessary for the college professor to perform various roles and responsibilities that are as much important as student mentoring for*
their own performance evaluation. To mitigate the issue of student mentoring, we are proposing an automation called Mentoring Chatbot using Artificial Intelligence framework. This technological solution can be beneficial not only students' mentoring but also for prioritizing effectiveness of professors' time toward other major issues and other imperative duties. According to our research, we found the following Bots that also provide approximate answers to the existing problem. One of them is Chatbot for College Student Programme Advisement. This College Student Programme Advisement chatbot can give appropriate responses to users requesting for course details and studens' views. Another available answer in the market is 'An Intelligent Career Counseling Bot'. It proposes an intelligent chatbot system for career counseling, which will help the user in selecting the right career by giving a proper response to the user's query. By analyzing these bots we concluded that there exists no system that can act as a virtual mentor and help students whenever needed. This paper presents a literature review that describes the uniqueness of this Mentoring Chatbot.

1. INTRODUCTION

In higher education, academic mentoring plays a key role in student support services. Student mentoring usually talks about providing facilities such as supporting program choice, general counseling, individual problems, and professional development. A student's evolution, confinement, and graduation can be certainly impacted by giving the college students suitable and appropriate guidance. There are various benefits of academic mentoring that includes current student's loyalty and help in future student enrollment. In the traditional academic mentoring method, the student has to schedule a session with their mentor, who is aware of the student's program and a possible track a student experiences. College Professors have many other roles and responsibilities that have to be given more priority than mentoring a student's performance. All these phenomena express the problem intensity and the issues that one can face if a suitable solution is not found. Thus, we are putting forward a technical solution as a constructive mean of reducing the issues faced in student mentoring**.**

A chatbot is "A computer program designed to simulate conversation with human users, especially over the Internet". Mentoring Chatbot using AI framework is an artificial intelligence-enabled chatbot that acts as a virtual mentor, helping students with their academic as well as personal problems to achieve the highest level of results, with the limited time and resources that they have. The appropriate technical solution can help not only the students' mentoring processes, but will also help the professors to prioritize their time towards additional important matters and responsibilities.

2. LITERATURE REVIEW

"Chun Ho Chan, Ho Lam Lee" et al (2018)[1] developed Programme Advisement chatbot for students that can provide appropriate replies to the user's doubts about course information. The development of chatbot was done in two steps. Initially in order to provide accurate course information via chatbot interface to the students, they investigated other effectual approaches. Two issues were investigated during development that comprise how

students will be able to specify their intent while interacting with chatbot and the way to present information of courses to the students. Next, they investigated more analysis and recommendation functions for building chatbot. As per students' preferences, chatbot recommended various suitable set of courses.

"Menal Dahiya" (2017)[2] explained what is chatbot, implementation of the chatbot and information about the design. This paper presented the methodology for building chatbots and their application in several domains. Also, they have explained the comparison between different chatbots. This paper presented a survey, according to which it can be infered that due to variety of techniques and methodologies used for designing chatbots, the development and enhancement of chatbot designing

increase at an uncertain rate.

"Archana Parab, Siddhesh Palkar" et al (2017) [3] proposed an intelligent chatbot system for career counseling, which will help user in selecting the right career by giving an proper response to user's query. To accept the user's input and analyze user's queries, they used algorithms of artificial intelligence for career counseling project. It provides some valid solutions to the users' queries. This bot is an intelligent system that will think like humans. Due to an appropriate knowledge base, bot provides quick answer to user. ICCB system take both voice or text as an input.

"Jordan J. Bird, Diego R. Faria" et al (2018)[4] suggested an approach where human-bot and bot-bot communication via text messaging can be learned by a chatbot software. The chatbot takes input from users and checks if it can respond to users' messages correctly on the basis of current stored knowledge, if not it is programmed to study a significant replies to text messages using pattern matching. The algorithm had a significant advancement in chatbot's performance, after adding an innovative method of message simplification to the chatbot's architecture.

"Luke Fryer, Kaori Nakao" et al (2019)[5] examined inspirational implications of chatbots along with learning techniques, for language learners. While explaining how chatbots can be more successful language learning partners, they compared the interest that students experienced while communicating with chatbot and a human partner. In this paper, they have examined a complex communication between strengths and shortcomings of existing chatbot technologies, abilities of language learners and their interest to connect with software. This study results in pointing right path to educators for using various existing chatbots available on internet.

"Fabio Clarizia, Francesco Colace" (2018)[6] suggested a chatbot as an educational support system which is a demonstration of chatbot model in education domain. In this paper, they have presented a designing of chatbot's architecture, methods and techniques used for interaction with users as well as for providing accurate responses to the students using natural language processing algorithms and ontologies of domain. Once the implementation of chatbot, they carried out an experimental campaign to determine the utility of chatbot.

"Leon Ciechanowskia, Aleksandra Przega linska" et al (2019)[7] shows the study of human-chatbot communication where human interact with different types of chatbot interfaces and how they response to these interfaces of chatbot. The research contain users' level of psycho-physiological reactions and a detailed questionnaire that can evaluate the communication and their interest to communicate with a chatbot. Major findings confirm that stronger negative effect, emotional arousal, and increased uncanny valley effect ("weirdness" or discomfort) while communicating with the chatbot which is enriched with animated avatar and sound.

"Asbjørn Følstad, Marita Skjuve" et al (2019)[8] presented four different chatbot purposes for the analysis of complex chatbot interaction methodology that may be supported by topology which will study the helpfulness of the typology. Furthermore, based on topology dimension, they analyzed 57 chatbots. They also explained the significance of topology for developers and service providers. They have presented the usefulness of topology as a guide for detailed analysis as well as a guide for interaction design of chatbot for content sorting, education, customer support and personal assistance.

"Juanan Pereira" et al (2018)[9] presented an primitive script-based communicational abilities but there are other more important dimentions: interaction, integration, testing and analysis. The paper discuss the activities arranged along these four dimensions. They reported on chatbots with three different purposes: online regular teaching, massive online teaching and health related subjects. The takeaway message is that in chatbot development there is more than Natural Language Processing. The paper states that before initiating chatbot development, developers should take into consideration various dimension that chatbot development contain.

"Heung-Yeung Shum, Xiaodong He" (2018)[10] discussed fundamental technologies in building chatbots from basic flow of chat to visual alertness to expertise, Using XiaoIc. In addition, they have shown the methodology used by XiaoIce to recognize emotions and how it engages users by chatting with proper and engage the user throughout long conversations with proper responses. They explained that social chatbots has the ability to reply to users' varied requests as well as to connect with users emotionally. The chatbot can serve users' need for interaction, fondness and social belonging.

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A thorough review of literature revealed that there are many applications of chatbot such as programme advisement chatbot, career counseling chatbot. These paper provides the consciousness for need of a Mentoring Chatbot using AI framework which is an artificial intelligence enabled chatbot that will act as a virtual mentor, helping students with their academic as well as personal problems to achieve highest level of results, with the limited time and resources that they have. Students will be able to communicate with Mentoring Chatbot as if they are having conversation with real mentor. It is very challenging to take decisions for students' queries but that will be easier with the intelligent system like a chatbot. It will be more beneficial than the traditional faculty mentors in the prospect of availability presumably because they are not as promptly available as online services and website.

3. PROPOSED METHODOLOGY

Mentoring chatbot will be developed using an open source Conventional AI framework. The Chatbot will first receive input from the student. Here NLU component will take this input, understand the intent of the user and find the entities. The input will then be matched with the Bot Database. The second component will generate the reply message for the chatbot. It takes the output and applies AI models to generate a reply. Based on this, a weekly report will be generated which will be sent to the respective mentor for evaluation. Moreover, mentors will be able to view questions that the chatbot was unable to answer efficiently, and then they will personally contact the individual student to provide a more precise or thorough solution to the query. The proposed methodology Figure 1 is:

- The Chatbot will accept the input from the students in form of text. The inputs may include queries about academic stress or personal problems.

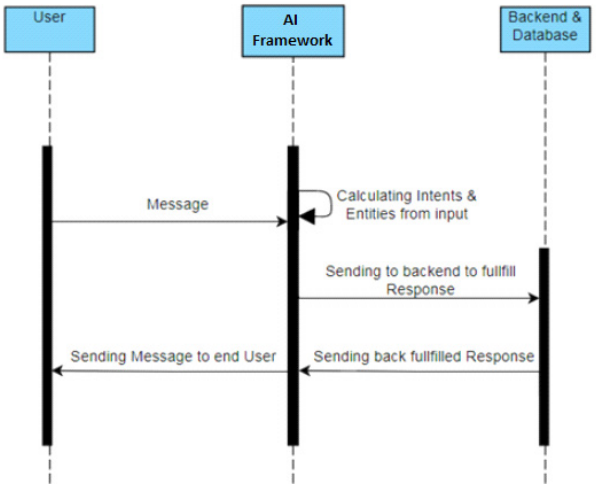

Figure 1: Sequence Diagram

- The input from student will be processed according to Bot database.
- One of methods will be used in this application is to match the pattern (using pattern-matching algorithm). The bot would match the input sentence from the user with the database of the framework.
- Then according to database, Chatbot will suggest appropriate solution for student's problem and help them achieve goals.
- According to student's chat history, the Chatbot will create a weekly progress report of student which will enable their mentor to do the analysis of problems as well as improvement of student

3.1. ADVANTAGES

The AI Mentoring Chatbot to be presented for resolving the problem regarding academic mentoring. Since mentoring is compulsorily practiced in all schools and colleges, this Mentoring Chatbot will be very well anticipated in the market.

The AI Mentoring Chatbot can help students to make decisions and offer different aspects of information and recommendations. Bots are basically virtual robots and can attend more than one students 24/7. Our Mentoring Chatbot will provide official information as well as faculty opinions.

4. SCOPE

The AI Mentoring Chatbot can be referred as 'Virtual Mentor', is a elementary type of artificial intelligence software that can imitate human conversation particularly a teacher or mentor. The AI Mentoring Chatbot can be examined and enhanced which will be used in a variety of domains such as learning, corporation, training sessions, distant learning programs, offices, etc. Mentoring Chatbot can be used in the field of education as a paramount tool since AI (Artificial Intelligence) is a vast area of study and the technologies are developing enormously in this field.

The FUTURE SCOPE may include addition of the voice recognition system so as to extend the Mentoring Chatbot system with voice command acceptance system.

5. CONCLUSION

Mentoring is considered as prime component of student support. An academic mentor, who is typically a faculty member, can be viewed as essential factor in improving student engagement.

The AI Mentoring Chatbot could be an innovative and a much-needed tool for both – mentors and students, which is available anytime and every time at any place with a guarantee of privacy. It will be better than the traditional faculty mentors in the prospect of availability presumably because they are not as promptly available as online services

and website. AI Mentoring Chatbot will have an innate appeal to students who might be reluctant to pay a visit to the mentors. With this technology, every student can own a virtual mentor in their own hands without much of an effort.

This further helps by allowing the students to talk their minds out without being uncomfortable. It will help students to overcome stress, depression & anxiety by answering to many of their doubts and problems for which they tend to turn to a faculty mentor. It will act as coach & help change one's behavior which include motivating students and helping them to cope up with academic issues. It will decrease the time a mentor spends in maintaining the documentation.

The development of AI Mentoring Chatbot would be an important endeavor to accomplish such an unique mode of comprehensive student mentoring. The student mentoring services will be provided by the Mentoring Chatbot, mentors and counselors along with each of their uniqueness.

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