Towards A Chatterbot To Help Students In Distance Learning

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The challenge of schools and universities facing the incorporation of information technology was influenced by leaving the idea of knowledge monopoly and assuming that educational actions start from a collaborative work between professionals and students, in this manner the teacher is a mediator of relationships, content, and communications [1].
While technologies have been incorporated into classrooms and have become somewhat ubiquitous, programs and universities have incorporated technologies into their content delivery methods, making their materials accessible primarily to students themselves through LMS - Learning Management Systems - and later, to the general public, through television, radio and the Internet, breaking geographical barriers and increasingly and irreversibly implementing distance learning [2].
Contrary to what is imagined, distance education has been used in the university educational process since the 19th century, but the advancement and constant technological renewal allowed the distance education to gain new guise through computerized methods and active teaching methodologies [3], [4].

Distance learning enables the customization of the educational process by creating an immersive and inclusive environment in which students' specific needs can be met. In this modality, the student has access to education independent of the geographical distance, restrictive physical health conditions, labor obligations and even social seclusion [4], [5].
Ambiguously, technological advances have allowed access to information and the accelerated development and spread of distance learning, requiring teachers to play the role of facilitator, mediator, and stimulator of collective interaction [6], since teacher availability, given the student's temporal freedom to engage in classes or activities, it is not total [7].
The system consists of two subsystems linked to a Knowledge Base. The Chat, here named Chat Subsystem, is responsible for interpreting, translating, classifying, and responding to the message sent by the user.
Methodology

Response processing is performed on 3 levels. At the first level, the system will search a set of AIML files for predefined answers to the user's question. AIML files hold answers to well-defined and trained questions, such as greeting conversations. If satisfactory answers to the question are found in this step, the system responds to the user based on the messages found.

If there are no valid answers to the question, a second level of search is performed, whereby the message (or question) is broken down and keywords are extracted to assist in the context identification process. These keywords allow it to compose the structure of a search tree and then serve as the basis for an in-depth search. At this level, the system can answer more complex questions.

In cases in which the system is unable to answer the question through the methodologies employed in the previous levels, a third level is executed. In the latter methodology, the system uses a classification algorithm to determine possible answers by determining a degree of confidence that can range from 0 to 1, allowing the system to identify, through a predefined limit, acceptable answers to the question.
Training

At the first level of training, the system will hierarchically organize the content laid out in the document, separating its tags in descending order, then allowing the creation of search trees. The keywords, in turn, will be identified and classified for storage in the Knowledge Base.

After the search trees are created, the knowledge of the uploaded file is shown to the teacher for validation and latter storage in the Knowledge Base. The teacher will also be able to submit support materials that will help the students and which will be incorporated into the answer given by the system.
Results

The Chatbot implementation took into consideration usability issues as well as the widespread construction for messenger systems. Robot responses for greetings messages incorporate some varieties of emoticons, as well as a slight delay, justified by the message "Eduardo is typing ...".
Results

The Learning Subsystem was implemented so that it is possible for the teacher, during the submission process, to understand the process of classification and organization of content in search trees, as well as to validate its classification through a graphical representation.
Results

By analyzing the usage data of the Learning Subsystem and the Chat Subsystem, it is possible to compose a variety of indicators that will allow the teacher to incorporate content into the system, as well as to evaluate topics that generate a lot of doubts.
Conclusion

This paper demonstrates the implementation of an educational Chatterbot system that can answer students' doubts, as well as incorporate content by reading and classifying texts from preformatted files. The use of chatterbots is a viable and first-aid alternative, allowing institutions to strengthen the student's relationship with knowledge, even in the absence of the teacher. The application of such tools allows for higher availability of student services.

Artificial intelligence tools are highly applicable when incorporated into Chatterbots as they allow for easy knowledge management and rapid incorporation of content. The Chatterbot presented, besides including AI tools, also presents a usage report tool in which teachers can determine missing topics, incorporate support materials, as well as monitor automatically the teaching-learning process.
References


Thanks

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