A Question-Answering Environment for eLearning Tutors

Joaquim Moré
Computational Linguist in the Office of Learning Technologies
Open University of Catalonia (UOC)
Av. Tibidabo 39-15, 08035 Barcelona. Spain
jmore@uoc.edu
+34 93 2532300

Salvador Climent
Lecturer in the Department of Languages and Cultures at UOC
scliment@uoc.edu

Marta Coll-Florit
Lecturer in the Department of Languages and Cultures at UOC
mcollfl@uoc.edu

José Manuel Rivera
Product Manager in the Office Of Learning Technologies at UOC
jrivera@uoc.edu

Abstract—In this paper we present a tool, which is being developed at the Learning Technologies Department of the Open University of Catalonia (UOC), to help tutors to answer questions e-mailed by their students in eLearning environments. The tool displays multilingual contexts taken from course materials, forums, Wikipedia and scholar papers in the Internet that may help the tutor to answer the students properly. The system (Doraemon) allows tutors to update their knowledge and value the contribution of students in life-long-learning.

Keywords—Question-Answering systems, Tutor, Students, Search-Engines, eLearning

I. MOTIVATION

The UOC (www.uoc.edu) is a leading Spanish virtual University currently offering 33 university degrees, 10 Master's degrees 1 Ph.D. program, and several dozens of other courses. Communication between students, professors and tutors is completely performed via email or forums within a virtual campus and a system of virtual classrooms. Courses are taught in Spanish and/or Catalan.

Question-Answering systems (QAS) for tutors are generally aimed to help them when overwhelmed with students' questions and unable to give a timely response. The systems often reply the question automatically ([1], [2], [3], [4]) but there are difficult aspects for a human-being emulator. One of these aspects is question-identification in a message where the question is not only declared explicitly but implicitly, with deviations from formal and normative expression (e.g. typos). Another problem concerns questions about matters that are related to the academic subject but they are not explained in the course materials. In this case, the answers cannot be straightforwardly retrieved from a Question-Answer database or an annotated corpus ([1], [2], [4]). A way to overcome this drawback is to retrieve answers from Social Media Content ([5]) but, having into account the possible weird answers that can be found there, the system should learn to discriminate between good and bad answers, which is still too highly demanding for a state-of-the-art QAS.
Apart from these problems, which make tutors feel reluctant to trust automatic QAS, these systems do not take into account a process we have noticed in UOC's tutors messaging. Many times the questions trigger the tutors to search for information and learn new things, thus updating their knowledge. Many questions arise from student's reflections on exercises or teaching materials, so the tutor may be challenged to find a proper answer for an aspect he/she is not fully confident in, she has not considered before or, plainly, she did not know. This fosters a 'learn from your pupils' learning process, which becomes evident when the tutor reads in the forum a good answer to the question provided by one of the students.

In this paper we present a semiautomatic tutor-assistant environment that searches for useful contexts where a proper answer can be found. The system speeds up the searching time, allows teachers to update their knowledge, and helps to value the pupils' contribution in the acquisition of information both by teachers and students.

II. WORKFLOW

The workflow of the system consists of three stages. The first one is the presentation of a tag cloud of the relevant concepts referred to in the student's e-mail. The tutor selects the concepts he wants to focus on in order to find a suitable context for an answer. After ticking the concepts of the tag cloud, which are mainly in Catalan, the system searches for multilingual contexts of the concepts in the following environments:

1. Messages in forums posted in previous discussions: The question may have been formulated in previous discussions, and a student or another tutor may have posted a good answer.
2. UOC's learning materials: the system queries a search-engine developed at the UOC in order to find contexts from UOC's learning materials where the concepts selected by the tutor coappear.
3. Wikipedia: Links to Wikipedia entries in Catalan and English where the concepts selected by the user are explained.
4. Online academic papers: The system queries the Delicious' search-engine in order to find papers in Catalan and English whose tags intersect with those selected by the tutor. The system also queries the CiteULike search engine (http://www.citeulike.org/), a free online service that organizes academic publications, and retrieves articles by the same method. So the system displays Delicious and CiteULike results pages with links to articles that deal with the concepts selected.

Other free online academic services can be added to the system if tutors think they are convenient to get good contexts when searching for an answer.

III. EVALUATION

Preliminary evaluation rounds have shown that the environment is perceived by tutors as a very valuable help. Subjects are asked to assess the usefulness of the contexts displayed by the system by ranging from 'very useful' to 'it is a waste of time' answer boxes. We will also measure how pupils' answers retrieved from forums and context snippets from Wikipedia, Delicious and Citeulike search-engines contribute to the tutor's performance. We are currently running a more detailed evaluation process involving both tutors in practice and eventual tutors – since we guess either group might show relevant differences in the reception of the system. The final results of the evaluation will be presented in the Conference.

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REFERENCES


