Collaborative Acquisition and Evaluation of Question by Learners

Maroš UNČÍK*

Slovak University of Technology
Faculty of Informatics and Information Technologies
Ilkovičova 3, 842 16 Bratislava, Slovakia
maros.un@gmail.com

Web evolution allows us enormous access to information of all kinds and applies in all spheres. But this evolution also evoked a flood of information. Finding and classifying certain information is becoming increasingly difficult. In relation with using the Web as fast and flexible tool to support education it arouses a need of approaches for simplify searching and presentation of information.

Currently many educational web-based systems publish not just a static text, they do much more. With adaptation to the individual needs of students they support learning, communication and advice. The common way to keep content up-to-date is content enrichment such as adding annotations [1]. We present a method for content enrichment. We design an approach for adding new quality and interactive content to learning materials and integrate students as active parts of learning process. This potentiates to get the quality content, which is useful for students themselves and their peers, as reviewed in [2].

The very important parts of any learning material are questions, which summarize the keys facts of the education materials. Even though there are some approaches to automatic extract relevant questions from the educational texts, the quality of extract questions is still low. Creating questions by an expert is extremely time-consuming and from the expert view it is often difficult to specify the difficulty of questions, to choose relevant questions as well as the right wording of the questions.

We add questions with collaborative aspect. Firstly, the questions are added by students, who also participate on reviewing and authoring. Secondly, their peers can answer the questions and thus is the interactivity ensured. We believe that proposed approach leads to a new and quality content and improves learning process.

As in our method the questions are added by students who are just learning particular topics, we should pay attention to their quality. It is necessary that these questions have a similar level of quality as the expert's questions. Our idea is to evaluate the quality of questions based on the explicit feedback of students in

* Supervisor: Mária Bieliková, Institute of Informatics and Software Engineering

Spring 2010 PeWe Workshop, April 18, 2010, pp. 69–70.

conjunction with actions that students do in the educational system and also on the evaluation of expert (a teacher). For this purpose we designed the model for the question rating and the model for the rating of the user ability to create questions.

The entire method is divided into four steps, which are not necessary followed in the order as shown bellow, but are closely related:

1. Adding a question.
2. Answering a question.
3. Rating the ability of the student to create questions.
4. Rating the quality of the question.

The first and second steps are short-term from user's view, the user adds or answers questions. The third and fourth steps are a long term processes and it takes time to be able to calculate final values as we need some minimal amount of questions and answers inserted for proper rating. Rating of questions derives from the explicit rating of questions by students and implicit rating of questions, based on the actions of students in the system (the user rating model).

We include also a competitive element of motivation in form of gaining points in overall assessment. Students play a simple game based on receiving reward. Students do not know the exact procedure for the allocation of points, their job is to find a tactic that brings them the greatest number of points (in principle, adding quality questions and rate questions like others).

To evaluate our approach, we have designed and implemented a software component for adding questions, which is part of educational web-based framework ALEF [3]. We provide experiments in domain of functional and logic programming. The framework is based on the concept of system FLIP [4], but adds openness, flexibility and modularity. We plan to provide experiments at this adaptive system in the real study process. The experiments will be run for one week and the students will create the questions related to educational materials for programming language Prolog.

Acknowledgement. This work was partially supported by the Cultural and Educational Grant Agency of the Slovak Republic, grant No. KEGA 028-025STU-4/2010.

References

[1] Agosti, M. Ferro, N.: A formal model of annotations of digital content. *ACM Transactions on Information Systems,* (2007).

[2] Hsiao, I.-H., Brusilovsky, P.: Modeling Peer Review in Example Annotation. In: *Proc. of 16th International Conference on Computers in Education,* Taipei, Taiwan, (2008).

[3] Šimko M., Barla M. and Bieliková M.: ALEF: A Framework for Adaptive Web-based Learning 2.0. In: *Key Competencies in the Knowledge Society at World Computer Congress 2010 [submitted]*. Brisbane, Australia (2010).

[4] Vozár, O., Bieliková, M.: Adaptive Test Question Selection for Web-based Educational System. In: *Proc. of SMAP 2008 - 3rd Int. Workshop on Semantic Media Adaptation and Personalization.* Prague, CR, (2008).