

# Crowdsourcing in the Class

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With the emergence of technology enhanced learning, we witness paradigm shift in learning, especially when considering web-based learning environments. Benefiting from concepts introduced by Web 2.0, a student becomes more autonomous and less dependent on a teacher. She is provided with more competences since she can tag, rate, share and collaborate during learning. She becomes an active contributor rather than a passive consumer of learning content [1]. The activity of a learner is “boosted” not only in relation with a learning system, but also when considering collaboration during learning and content contribution [3]. This effectively involves a crowdsourcing process into the technology enhanced learning.

In our work we contribute to the domains of technology enhanced learning and crowdsourcing [2]. Our method assesses the information about correctness of combinations of answers and questions. It is motivated by the possible reuse of existing (but not evaluated) student-written free text answers to questions, which originated as the by-products of previous learning activities (e.g. exercises, exams) and are commonly available. The goal of the reuse scenario is to provide interactive exercise to the students with automated feedback using these questions-answer learning objects (QALOs). In it, the student is presented with the question and an answer to it (possibly correct or wrong) and has to decide about the correctness of the answer, after which he receives the feedback about the true correctness.

To enable this, we must know about the QALO correctness prior to the exercise. In case of exam questions, this information is available after teacher's evaluation. However, evaluating additional exercise (training) answers might become an extensive task. Because the automated evaluation of correctness of free text answers is not yet possible, the only option to substitute the teacher is the crowd - of students themselves.

In a simple scenario (see Figure 1), the student pulls the QALO and reviews it. After that, he sets correctness to it according to his opinion. Then he retrieves a feedback based on the previous answers of other students on this same QALO (the crowd answer). His own decision is then integrated into “crowd answer”, eventually modifying it.

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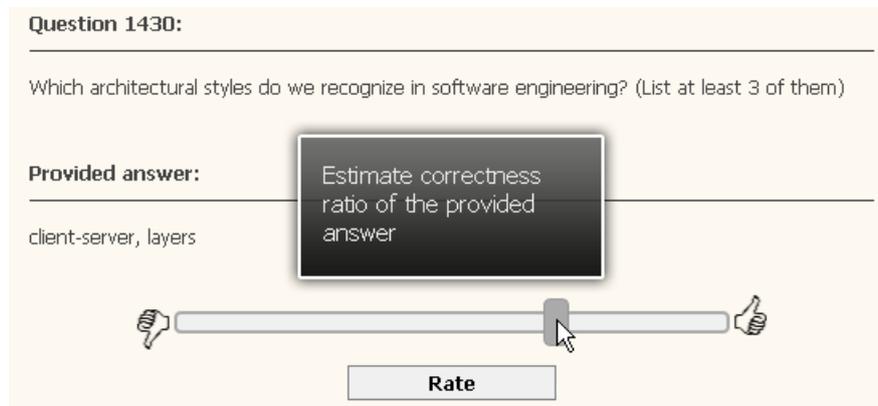


Figure 1. Interface of the exercise application, consisting of question, answer, correctness and correctness estimation slider.

We deploy the method within an existing learning framework ALEF, perform live experiments and show that using such bootstrapping crowdsourcing approach, the method is able to correctly evaluate majority of the QALOs, leaving only ambiguous or controvert answers to expert. Our aim in this work is to extend the approach:

*Student domain expertise detection and use.* We bootstrap the information about individual student level-of-expertise in the course domain and use this information for weighting student estimations to prefer more “skilled” users.

*QALO correctness estimation revision.* We extend the original user application giving the student a chance to revise his answer correctness estimate after he is confronted with the crowd feedback and the discussion. We aim to investigate, how do the students change their opinions and whether the revised crowd answer is better?

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