

Preparing First-Time CS Student Teaching Assistants

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ABSTRACT

Undergraduate Student Teaching Assistants (TAs) are an important help, especially in large undergraduate courses. They act as role models and as agents between students and teachers. They also help guide the students' learning process by supervising groups and grading homework. We prepare new undergraduate TAs by training their diagnostic and didactic skills.

CCS CONCEPTS

• **Social and professional topics** → **Computer science education**;

KEYWORDS

student TAs, training, teaching

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1 PROBLEM STATEMENT

Our undergraduate student TAs are often only a few semesters ahead of the students they supervise and support. Their weekly exercise groups usually contain 15-35 students. The TAs are expected to assist students in understanding and applying the topics of the associated lecture by working on sample problems, as well as grading the weekly homework submissions. Although the handing in of homework is not strictly monitored, most lectures in our first year of study require a minimum number of homework points to be achieved in order to be eligible for taking part in the final exam.

Our TAs are supposed to empower the students to achieve the exercise goals with as little direct advice as possible. The goal is that most students should find their own solution, assisted where needed by the TAs, but without simply receiving the solution or a step-wise explanation. The degree of support depends on the current student's state of progress and understanding, and can range from encouragement up to solution-oriented hints. Thus, TAs need to ask the right questions to determine the level of support needed.

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2 COMPONENTS OF THE TA TRAININGS

Our TAs receive a training roughly similar to the one outlined in [1] before their first group meeting, which depending on the concrete lecture takes between four and 16 hours, the latter split over two full days. Typically, there are also weekly meetings between the TAs and the lecturers or their assistants, where the upcoming exercise sheet and current issues are discussed.

The training prepares TAs for their job by a set of different activities, including brief presentations, think-pair-share activities, role-playing and individual work. The training covers basic topics, such as reflecting on what characterises great or weak TAs, how to structure the exercise session, understanding group communication, furthering teamwork, and approaches for grading homework. Emphasis is placed on three central aspects: preparing for the first exercise session, providing sensible and respectful feedback to questions and homework submissions, and using the Moodle platform.

Additional topics include embracing diversity, a role-play where the TA's attention is claimed by one persistent student while the remainder of the group simultaneously struggles with the task, and how to properly address cases of suspected academic dishonesty.

We also perform work shadowing and discuss the visited session to enable the TAs to further improve their teaching skills.

3 EVALUATION

Since summer 2014, about 400 student TAs have been trained. Both the TA trainings and the TA-led exercises are evaluated each term on a 1-5 scale, with 1 being the best possible grade. The trainings themselves have consistently received an average rating between 1 and 2 from the attending TAs.

Since we started the trainings, the satisfaction of our students with the TAs has improved noticeably. This is also reflected in the evaluation of the TA-led exercises by the exercise attendees, which has improved from a 1.97 grade (without TA training) to a 1.39 grade (with TA training), which is a highly significant improvement.

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- [1] Jeffrey Forbes, David J. Malan, Heather Pon-Barry, Stuart Reges, and Mehran Sahami. 2017. Scaling Introductory Courses Using Undergraduate Teaching Assistants. In *Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education (SIGCSE '17)*. ACM, New York, NY, USA, 657-658. <https://doi.org/10.1145/3017680.3017694>