

First Impressions of Using Stack Overflow for Education in a Computer Science Bachelor Programme

Stefan Hugtenburg
S.Hugtenburg@tudelft.nl
Delft University of Technology
The Netherlands

Andy Zaidman
A.E.Zaidman@tudelft.nl
Delft University of Technology
The Netherlands

ABSTRACT

Community Question Answering (CQA) platforms like Stack Overflow enable gamified and moderated community-driven knowledge creation. We report on our experiences of introducing Stack Overflow in our Computer Science BSc programme and explore whether these platforms can (1) reduce the workload of lecturers in answering questions in large-scale classrooms, and (2) create a community of learners in the large-scale setting of ~1600 students.

ACM Reference Format:

Stefan Hugtenburg and Andy Zaidman. 2022. First Impressions of Using Stack Overflow for Education in a Computer Science Bachelor Programme. In *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education V. 2 (SIGCSE 2022)*, March 3–5, 2022, Providence, RI, USA. ACM, New York, NY, USA, 1 page. <https://doi.org/10.1145/3478432.3499046>

1 STACK OVERFLOW FOR EDUCATION

Community Question Answering (CQA) platforms enable community-driven knowledge creation [1]. The knowledge thus created can be of an enduring value to its audience, and their voting and reputation mechanisms help users identify the trustworthiness and accuracy of the content [1]. In this paper we explore how Stack Overflow¹, which is widely used by professional software engineers, can serve our educational programme. We hypothesise that a CQA platform can (1) reduce work pressure for staff, as students are stimulated to answer questions of their peers, (2) create a community of learners, as they get an opportunity to help each other out in a large-scale setting comprising some 1600 students, and (3) build an enduring knowledge base that is easy to query and to moderate.

We have piloted the use of a private Stack Overflow site for 27 courses in our three year bachelor programme in Computer Science comprising ~1600 students. We perform a quantitative and qualitative analysis for the student perspective, and compare the usage of Stack Overflow to the usage of the LMS' discussion forum. Importantly, we describe lessons learned for others interested in embedding a gamified CQA platform in their programmes.

¹<https://stackoverflow.com>

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).
SIGCSE 2022, March 3–5, 2022, Providence, RI, USA
© 2022 Copyright held by the owner/author(s).
ACM ISBN 978-1-4503-9071-2/22/03.
<https://doi.org/10.1145/3478432.3499046>

2 CONTRIBUTIONS OF THE POSTER

The poster aims to add to the conversation about using Community Question Answering platforms in educational settings. From our own investigation, we bring forward four key elements, namely:

Students ask and answer more questions. We have observed that the number of questions that students ask on Stack Overflow has increased by 64% compared to our previously used LMS, and that the percentage of student-answered questions increased by 72%. In terms of work pressure for staff, we have observed a decrease in both the absolute (-145) and relative (-60%) number of questions they had to answer.

Answers have long-term value. While difficult to answer after our pilot year, our teachers indicate that they think there is long-term value. Specifically, they marked only 7.3% of questions as irrelevant to future academic years.

Early signs of community formation. While measuring the formation of a sense of community is difficult because we lack a baseline prior to introducing Stack Overflow, anecdotal evidence points at initial signs of this community forming. Students shared that they were recognised in real life after their contributions to the CQA platform, and formed partnerships for labs due to their online interactions.

Less repeat questions. We have established through moderation of the Stack Overflow posts that the total number of duplicate questions is now less than 2%, far less than we previously observed in our LMS.

3 FUTURE PLANS

We will continue to analyse how students use Stack Overflow, also when our MSc students get access. Furthermore, we will gauge the teacher's perspective of the use of a CQA platform.

ACKNOWLEDGEMENTS. This pilot was financed by a grant acquired through the "Stimuleringsregeling Onderwijs" from The Dutch Ministry of Education, Culture and Science (OCW). We would like to thank Susanne van Aardenne and Frank Mulder for their help with the grant acquisition and all of our teaching assistants and colleagues in moderating the platform.

REFERENCES

- [1] Anderson, A., Huttenlocher, D., Kleinberg, J., Leskovec, J.: Discovering value from community activity on focused question answering sites: A case study of stack overflow. In: *Proceedings of the 18th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pp. 850–858. KDD '12, ACM (2012)