

How Do Students Seek Help and How Do TAs Respond? Investigating Help-Seeking Strategies in CS1 Office Hours

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ABSTRACT

In introductory computer science courses (CS1), students who are programming for the first time will inevitably need help in order to overcome programming challenges. To accommodate large course sizes, most CS1 courses provide this help in the form of office hour sessions led by undergraduate teaching assistants (TAs). However, we have little understanding of how students go about seeking help during office hours, and what help they receive in return. In this poster, we present current findings from a grounded theory analysis of eight different CS1 office hours observations, and 16 interviews with the students and TAs who participated in them.

CCS CONCEPTS

• **Social and professional topics** → CS1.

KEYWORDS

help-seeking, office hours, teaching assistants

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1 INTRODUCTION AND BACKGROUND

In introductory computer science courses at the university level (CS1), students who are programming for the first time will inevitably encounter challenges, and need help. When educators provide students with help, they can enable students to overcome problems that they would otherwise struggle to solve on their own. To do this, many large CS1 courses in the US leverage the scalability of office hours sessions led by undergraduate teaching assistants (TAs) to provide students with opportunities to receive help.

Providing students with an opportunity to receive help through office hours, however, does not ensure that the help that they receive will result in desired learning outcomes. Research in the learning sciences shows that how well students *help-seek* influences how well they develop mastery of course knowledge and skills [1].

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Current computing education literature has not yet described the types of strategies that students use when asking for help, such as the types of questions they ask over the course of an office hours session. To address this gap, we investigated CS1 office hours to better understand the help-seeking strategies that students use and what strategies TAs use in response.

2 METHOD AND RESULTS

We observed and recorded virtual CS1 office hours at a medium-sized private university in the midwestern United States. After each observation, we conducted interviews with each participating student and TA. In total, we observed eight office hour sessions across four participating TAs and eight participating students.

Our data analysis was conducted using a grounded theory approach [2] that followed a process most grounded theory researchers propose: starting with descriptive, *open codes*, using those to build towards more abstract, *axial codes*, and then exploring the relationships between the ideas in our codes to reach a *core concept*.

Through our analysis, we developed a framework for classifying and interpreting the various strategies that students and TAs use during office hours sessions. The framework is divided into two main parts: first, problem-based strategies; second, knowledge-based strategies. Problem-based strategies encapsulate strategies that students and TAs use to find common ground on the immediate problem that a given student is facing, while knowledge-based strategies encapsulate strategies that students and TAs use to address the underlying knowledge and skills that a given student needs in order to solve their problem. Afterwards, we revisited the observations, and found that students and TAs primarily used problem-based strategies over knowledge-based strategies. Furthermore, we found that students and TAs used a limited number of strategies in each observation. Based on these findings, we believe that students and TAs are ineffective in addressing the underlying learning needs that lead students to ask for help in the first place.

3 FUTURE WORK

Currently, we are exploring designs for supporting an effective help-seeking process during office hours sessions. We hypothesize that our strategy framework can be used to help guide students and TAs towards better strategies for identifying and addressing the particular learning needs of students during office hours sessions.

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