



# COMPS Software for Student Agreement in Computer-Mediated Group

## Problem Discussions

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### Introduction

The COMPS chat system facilitates the COMPS project by providing students with an interactive system to test their Java programming skills through group discussion. Groups chat electronically to examine programs and develop an appropriate solution, which a TA monitors and provides feedback. The COMPS system must be responsive to student conversation and has progressed to stifle unproductive behavior and meet the demands of the lab environment. In order to achieve this, we developed a unique answering system to promote student participation and interdependence within the group.

### Motivations

- Relate semester-level student enthusiasm to situational interest in the labs.
- Facilitate conversation and problem-solving to enhance student education.
- Focus on individual accountability to encourage student participation
- Promote group cooperation to produce solutions and reward group efforts
- Provide a efficient answering procedure that does not inhibit free-flowing discussion

### Future Work

#### Streamlining the lab process

- Implement a separate webpage that will allow the student to complete all relevant information for the lab
- Lowering the amount of knowledge required to learn the collaborative lab process

#### Technology:

- Machine-identification of features to feed a dashboard evaluation of the discussion.
- Real time statistical analysis of student conversation in order to monitor group and individual behaviour

### Developing the Answer System

Despite improvements to the interface, submitting answers to the problem had major shortcomings.

- TA's are required to ensure the students explain their answers. This means reading the whole conversation across several groups to fit this policy.
- Students had to submit their final answer as the last sent message. Some students would submit an answer and ignore their group.
- Students would bypass the objective of the discussion, and either run code in an IDE or ask another group for the answer.

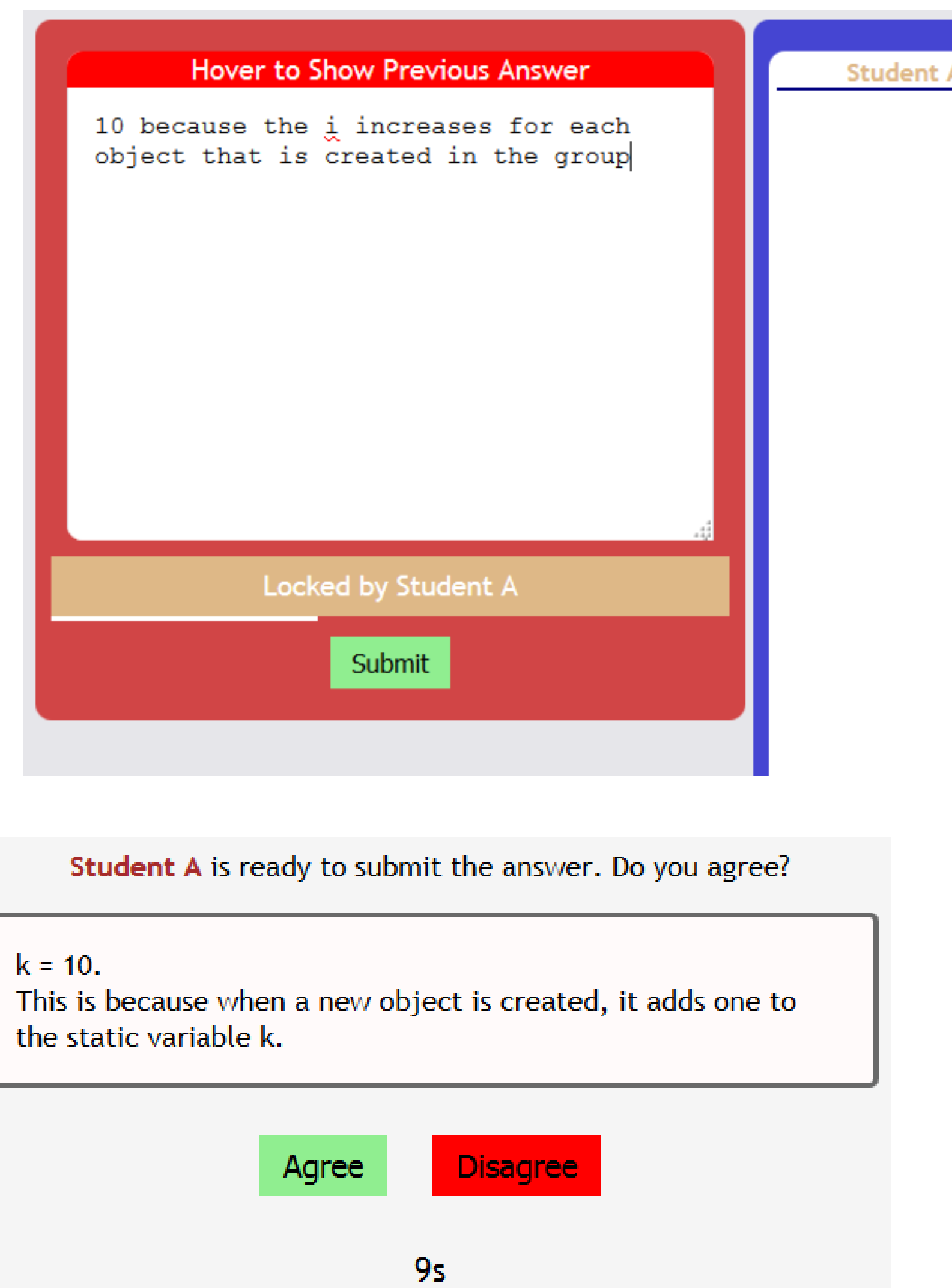
Student	Message
Student A	ok
Student A	I think its B
TA	no
Student A	C
Student B	might be D
Student A	i'm thinking D too
Student B	lets see
Student B	TA?
Student A	A and C
TA	yes
TA	that's right

**Example:** Students guessing to bypass a question. It is very ambiguous to the TA if they understand the concept and the required explanation is **not** provided.

The Answer System addresses these issues by adding a separate Answer Window from the Chat Window, where students can develop their answer and explanation together before submitting.

Any student can contribute to the answer which promotes discussion between the group before the answer is written. Students are encouraged to talk with each other to reach a conclusion.

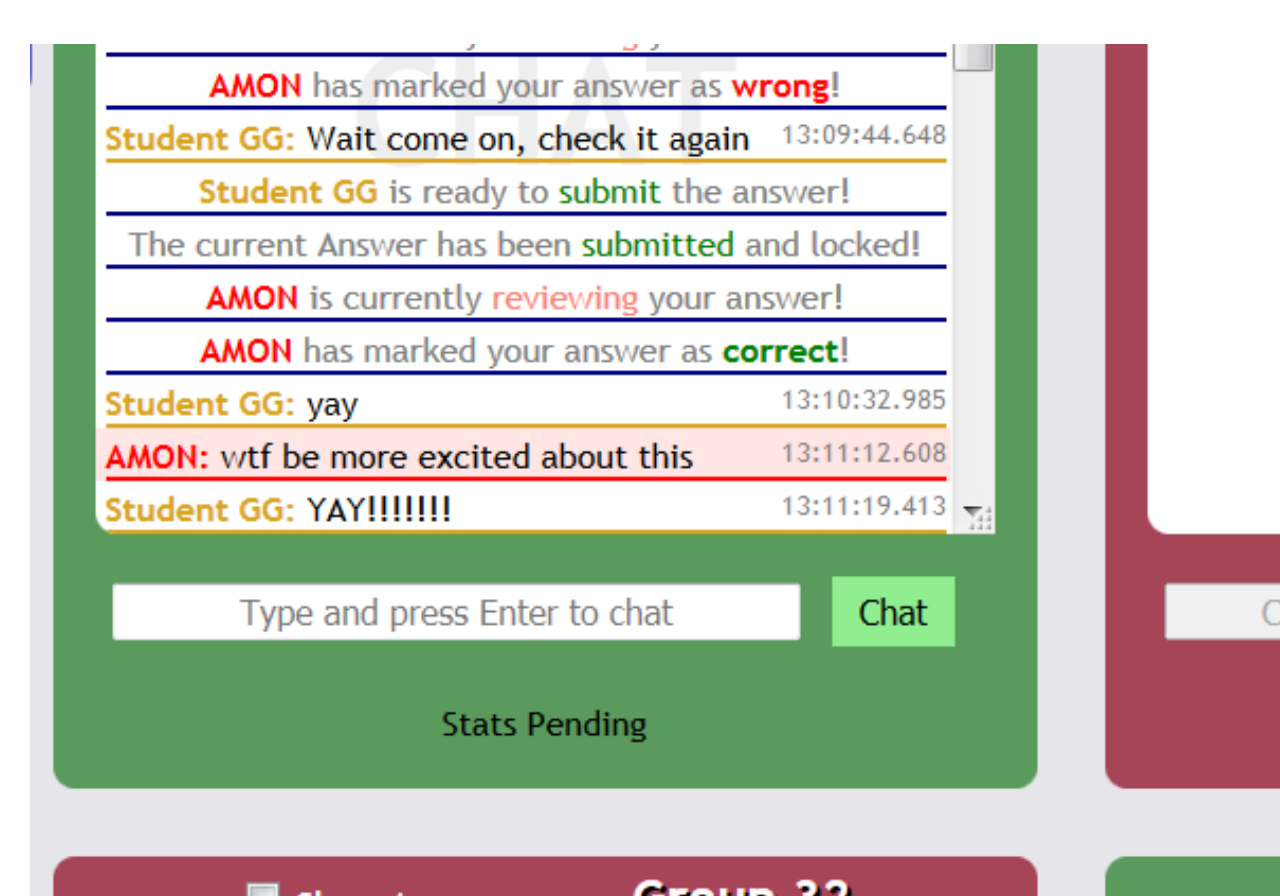
In addition, the Submit button requires all students to read and vote on the answer. This promotes accountability for each student and thus raises total participation from each group member for the group to work effectively.



### Improving the Instructor Experience

Prior to these changes, TA's had to monitor students using the same page as the students do.

We were able to improve the COMPS system by allowing the instructor to view multiple chat rooms at once.

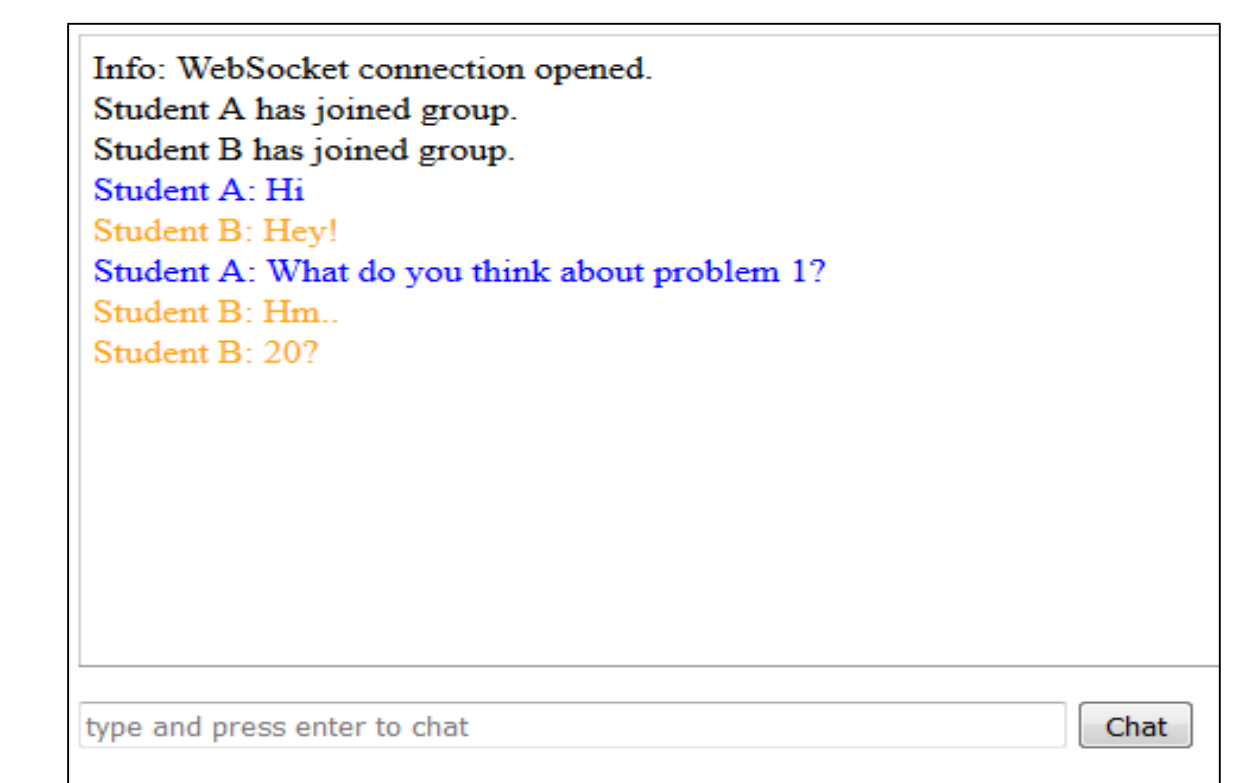


The COMPS system is adding and improving multiple features to give the instructor a better overview of the student group as they chat.

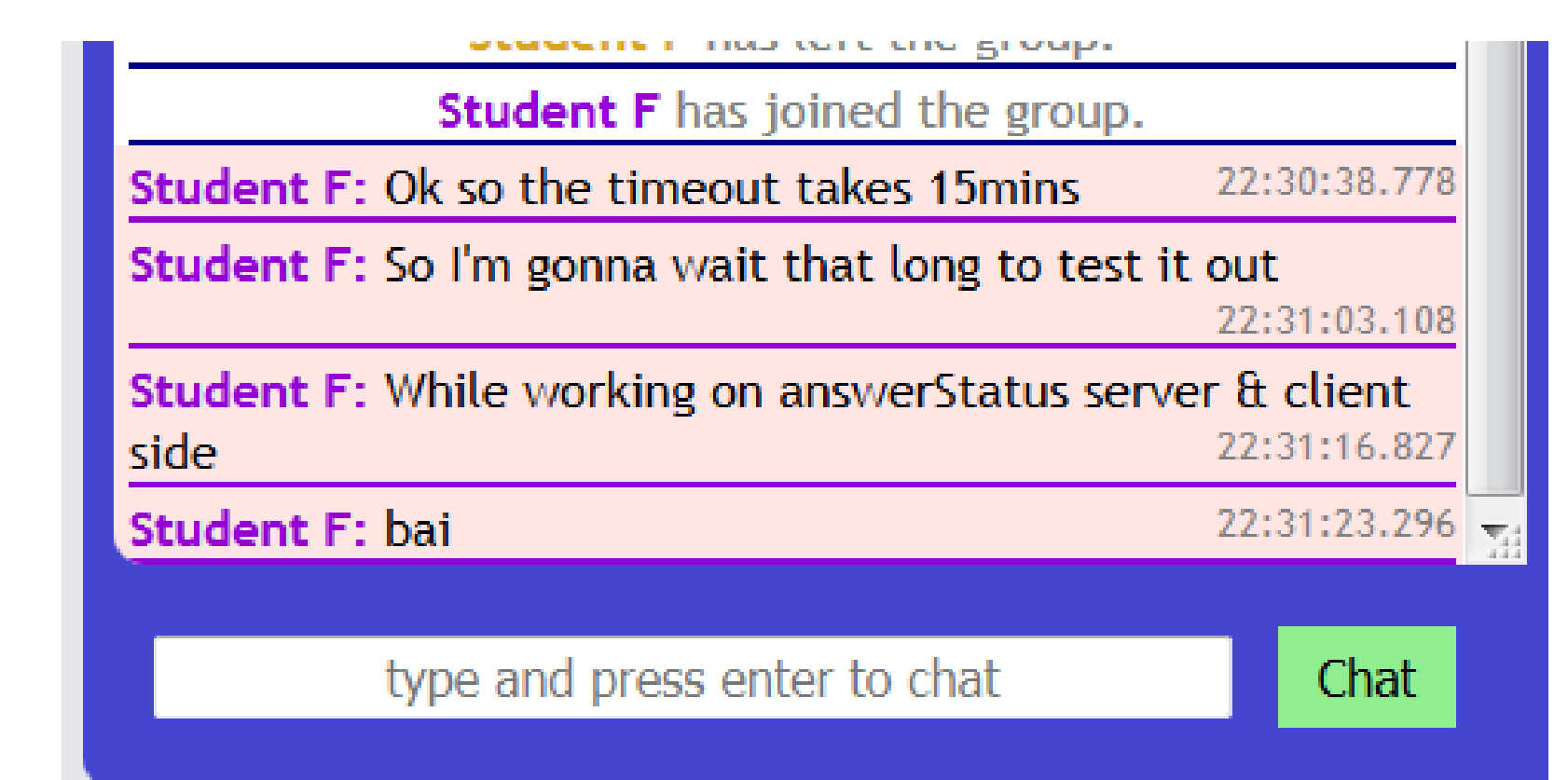
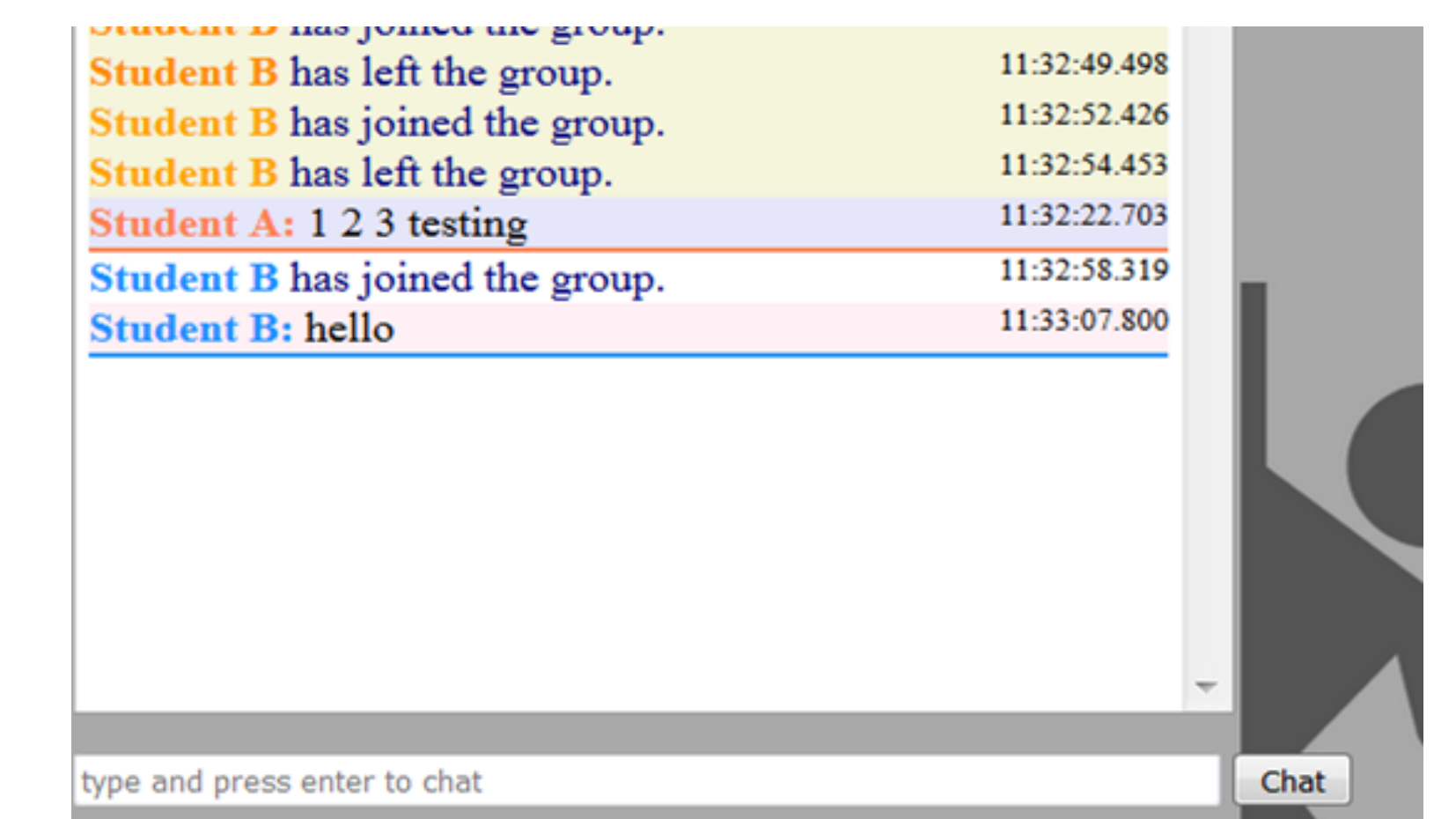
An experimental system tested during one of the lab sessions tracks student statistics in real-time, giving the instructor quantitative information to better monitor the student's progress. The stats included typing & sent messages compared to the total for that group, which could identify students that were high contributors at a glance, and other students that contributed less and were non-participatory.

User	Typing	Chat	Participation
Student B	4	1	10%
Student A	85	3	89%
Total	89	4	∞

### Progression of the Chat Interface



The initial version of COMPS used a very simple chat interface that relied on students cooperation to submit answers correctly. Fully colored sentences turned out to be difficult to read for both students and TA's and made the overall conversation difficult to track.



The interface and font were modernized and colors emphasis was reduced. In addition, certain messages are highlighted based on their type and content to give student conversation greater clarity for both student and teachers.

### Result

The rewritten COMPS system has been applied to 5 different lab sessions over 2 semesters and two universities which resulted in 51 discussions of 3 students each. The Answer System has been utilized in two of these lab sessions during October 2016. Results are pending on the system but students and TA's are currently using the system effectively.

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