Pilot implementation of an online homework system for practice and feedback on decision-making skills

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Overview

- University courses emphasize the importance of decision-making skills, yet not many opportunities exist for students to apply these skills

- Feedback is useful for students to determine what areas of the course they need to spend more time learning

- This project is an evaluation on the pilot phase of Alchemy, an online homework software with a focus on immediate feedback and the ability to reattempt problems

Experimental Method

- Developed "scenarios" (multiple-choice problems sets) for different topics of CHEM 211 (Strong and Weak Acid, UV-Visible, Equilibrium)

- Scenarios were similar in style to Choose Your Own Adventure

- Included immediate feedback for both correct and incorrect responses and reattempts

- Obtained student feedback via "Think Aloud" interviews and user-experience survey

Alchemy (Complete Scenario)
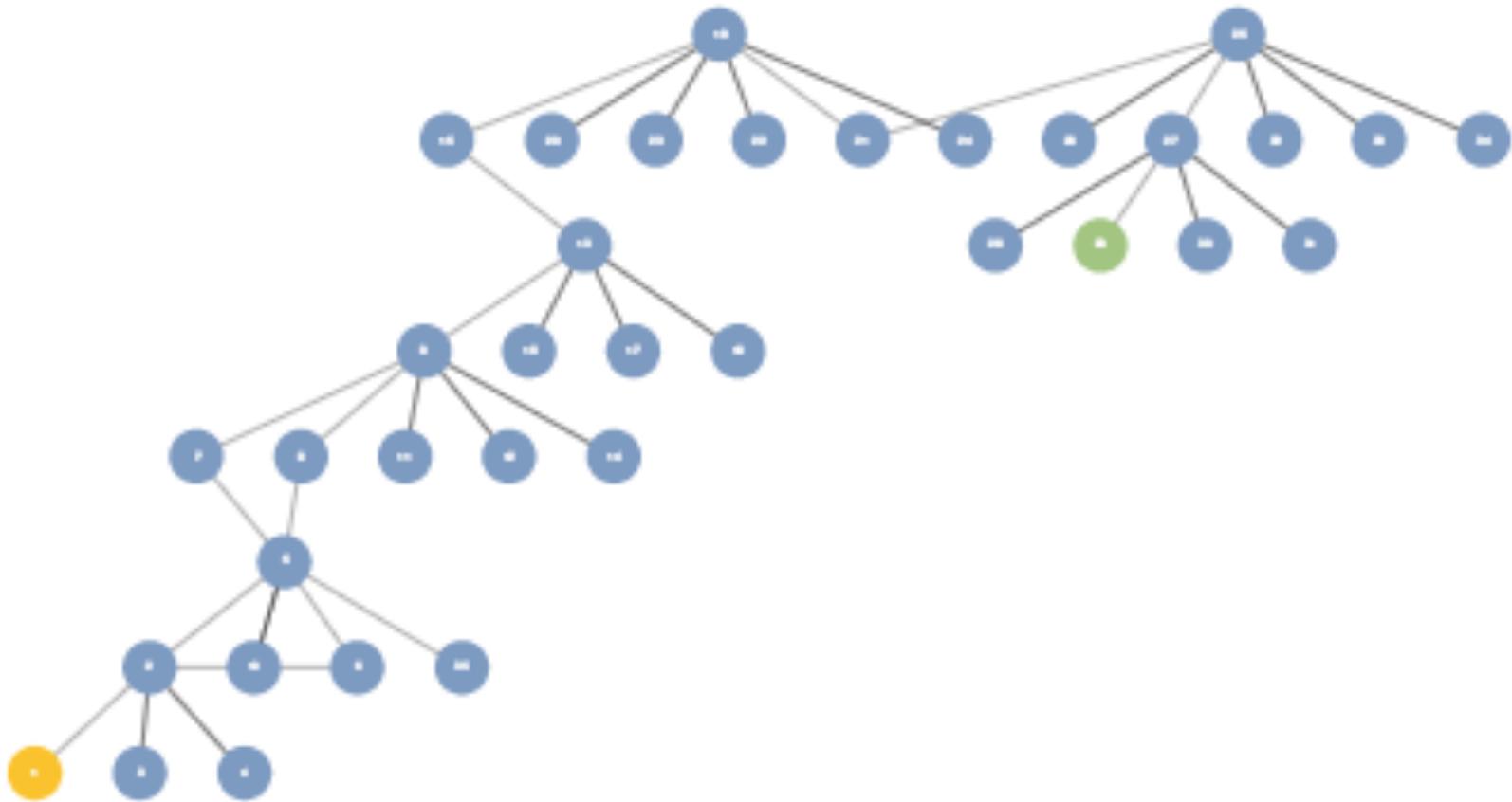
Alchemy (Individual Question)
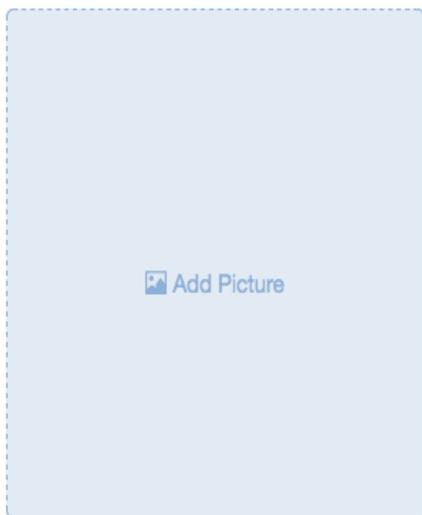
Reporting View - Class
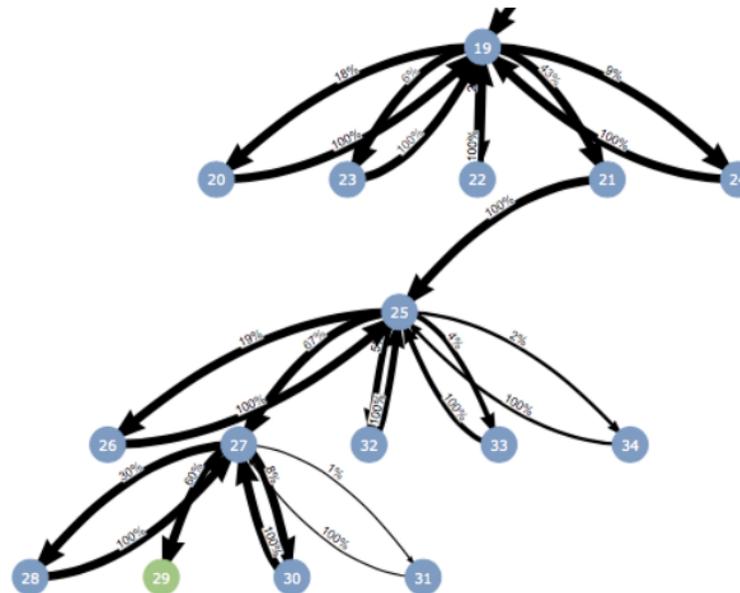
Reporting View - Student
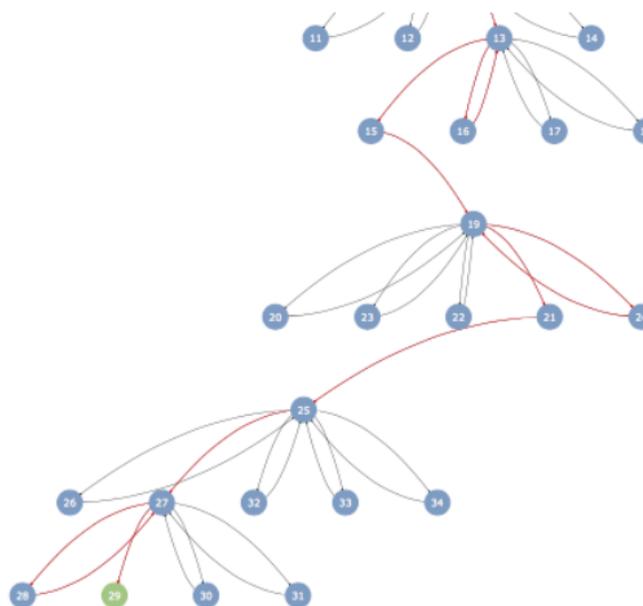
Results: Survey (91% response rate)

Figure 1. Helpfulness of Tasks and Feedback
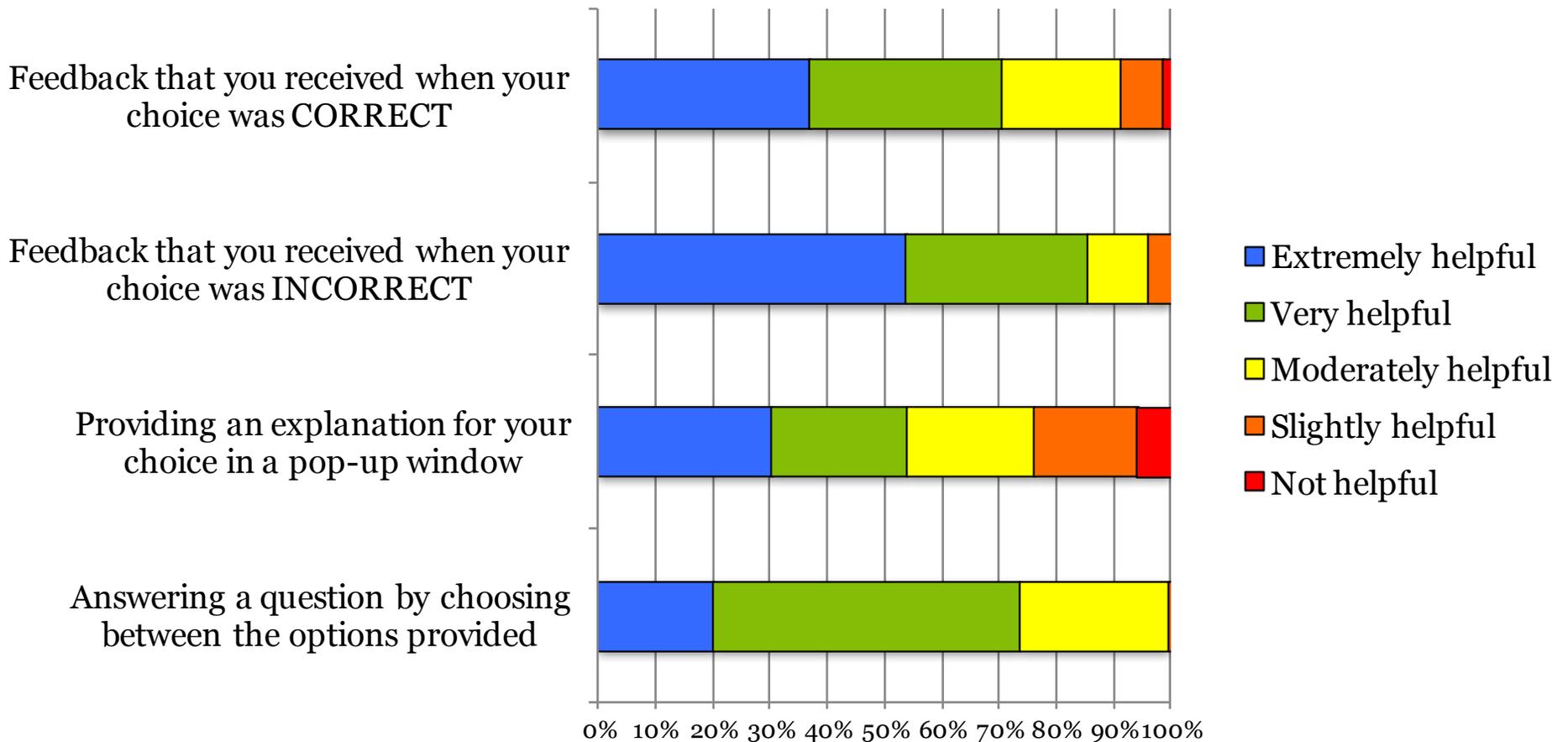
Results: Guessing Frequency

Figure 2. Guessing Frequency

Legend:
- Never
- Rarely
- Some of the time
- Most of the time

6% — 21% — 59% — 14%
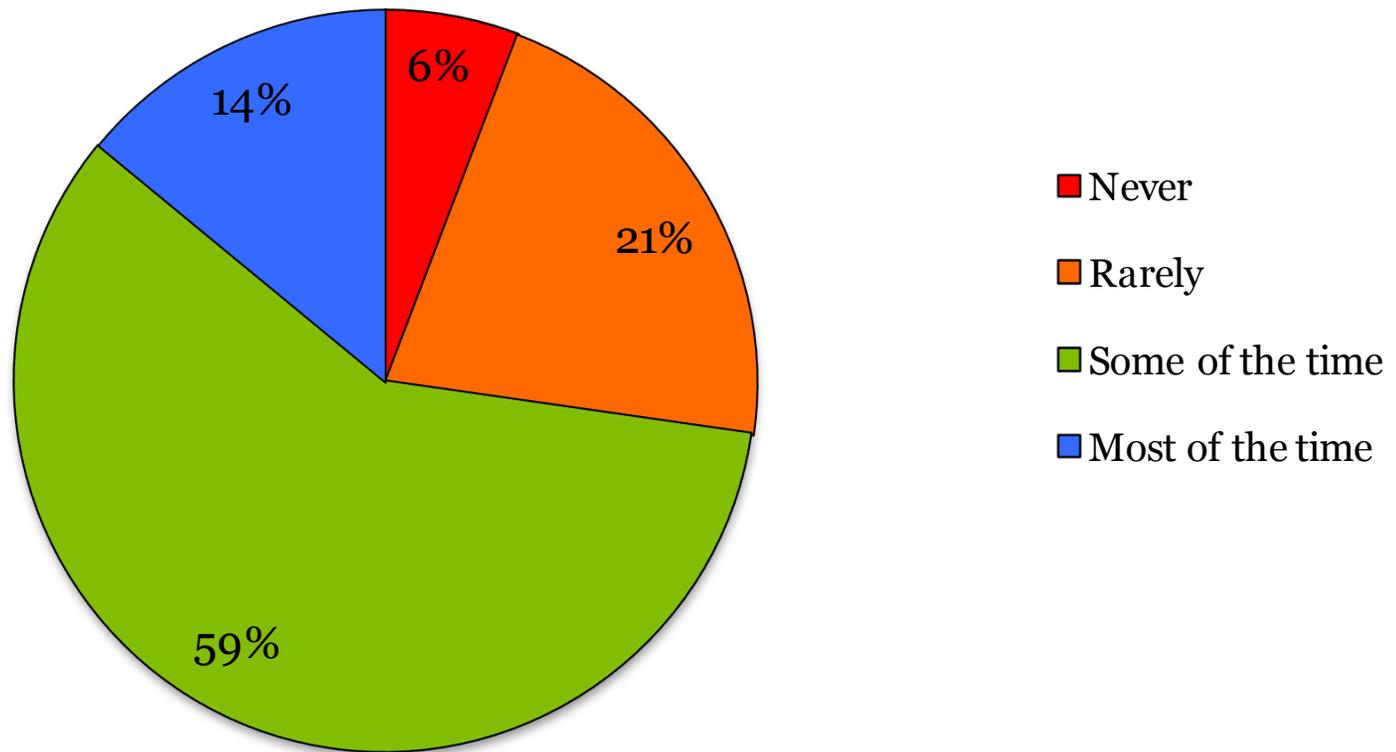
Summary

- Immediate feedback for both correct and incorrect responses was helpful for students

- Most students found Alchemy to be a useful tool for conceptual understanding and exam preparation

- Correlation between mixed consensus on use of justification box and guessing frequency

Future Research Questions

- What types of feedback are most beneficial to student learning?

- Does requiring students to justify their choices increase learning benefits?

- Can regular use of the Alchemy software increase students' reasonifng ability?

Acknowledgements

- Dr. Jane Maxwell

- Dr. Russ Algar

- UBC Computer Science (CS 319) students who built the Alchemy software

- CHEM 211 students who participated in interviews and survey