Bridging the Experience Chasm in Computer Science: An Inter-term Bootcamp Approach

Mark S. Kim, B.S.[1]
Hannah Simon[2]
Shasta Ihorn, Ph.D.[3]
Anagha Kulkarni, Ph.D.[4]

Introduction

Students majoring in computer science often have little to no computing experience before entering college and this can affect students' confidence and performance throughout their education (Alvarado et al. 2018). To mitigate this obstacle, we attempt to boost students' confidence, reduce learning loss, and provide foundational support by offering a four day online winter term bootcamp as a bridge between their introductory and intermediate computer science courses. This is a qualitative study examining the experiences of Computer Science students that participated.

Methods

- Participants: P = 21 first year students majoring in Computer Science and entering their second semester at SFSU.
- Time: T = 20 hours of a combination of lecture, group exercises, and exercise review.
- Surveys: Students responded to a daily open-ended survey administered via Google Forms about the efficacy, enjoyment, and learning outcomes of each day.
- Analysis:
  - As proposed by Braun and Clarke (2006), we conducted a **thematic analysis** of the student survey responses.
  - Instructor's notes and observations were paired with the thematic analysis to determine any disparities between student experience and instructor's observations.

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First year, continuing Computer Science students report that "going over solutions and having explanations about them" was the most beneficial activity for learning and review.

Please direct any questions or suggestions to: mkim22@mail.sfsu.edu

Results

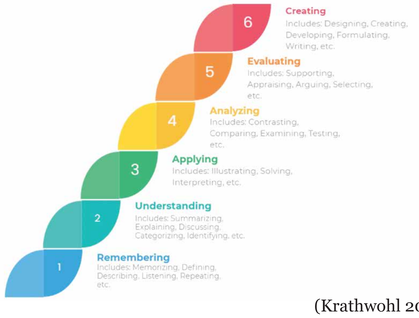
Student self-reporting:

- Lectures and review of previous semester material were both helpful and enjoyable except for subjects that they were confident in (which varied significantly between students).
- Lab-like in-class exercises were both helpful and enjoyable, but more enjoyable than helpful.
- Explaining and examining exercise solutions was found to be the **most beneficial activity**.
- Opinions on group work was largely split, with some enjoying it and others finding it as the least helpful part of each session.
- The 5 hr sessions were too long and did not have enough breaks.
- Most difficult subjects were Arrays, Methods, and Loops

Instructor's Observations:

- Students were enthusiastic about reviewing solutions to the exercises.
- Most students did not interact within the group breakout rooms.
- There was a wide range of expertise within the cohort.
- Despite some students reporting review of some subjects as being unhelpful, it was obvious that their understanding of many of those subjects were still underdeveloped.

Revised Bloom's Taxonomy



(Krathwohl 2002)

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[1] Graduate Student, Data Science and Artificial Intelligence M.S. Program, Department of Computer Science, SFSU
[2] Undergraduate Student, Psychology B.S. Program, Department of Psychology, SFSU
[3] Assistant Professor, Department of Psychology, SFSU
[4] Associate Professor, Department of Computer Science, SFSU

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