

Using Student Perceptions of Laboratory Work to Understand Learning and Attrition in Programming Courses

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Description of the session

One of the most common problems faced by instructors in introductory programming courses is the high rate of student attrition. Laboratory experiences are often used to try to reduce this problem because they facilitate active learning, provide hands-on programming experiences and encourage teacher-student interaction [1][2][3]. Even when instructors include laboratory sessions to foster inquiry-based learning, it is not unusual to have 50% of the students drop out of the course before it is completed. This project is an attempt to understand some of the factors that cause such high rates of attrition.

Students in the introductory computer courses (C++ Programming I and II) serve as the sample for this study. Each week students are engaged in laboratory work, primarily designed to provide hands-on experience for the material being presented in the class in that week. A typical laboratory assignment starts with a student either writing a computer program in its entirety or completing a partially written program. The students then perform a series of experiments and answer related questions. These programming projects are completed in the computer lab under the supervision and guidance of the instructor and teaching assistants. Each semester students complete about 13-15 lab assignments.

At three different points during the course of the semester students are asked to rate the effectiveness of the lab experiences based on various criteria such as understanding the programming concepts, improvements of grades on homework and quizzes, motivation, interest, and other perceived benefits. A series of chi-square analysis would be done to show the changes of attitudes over the period of a semester. Research findings will be discussed at the presentation.

References:

- [1] Penny, J. P., Ashton P. J., Laboratory-style teaching of computer science, *ACM SIGCSE Bulletin*, 22 (1), p.192-196, February 1990.
- [2] Sanchis, L. A., Computer laboratories for the theory of computing, *Proceedings of the sixth annual CCSC northeastern conference on computing in small colleges*, 262-269, 2001, Middlebury, VT.
- [3] Walker, G. N., Experimentation in the computer programming lab, *ACM SIGCSE Bulletin*, 36 (4), 69-72, December 2004.