DESIGN THINKING IN PROGRAMMING LABS

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Abstract

Design thinking is a method for creative thinking and fostering idea development. Design thinking is usually used for solving “wicked” problems which are considered to be highly ambiguous or complex with many knowns and unknowns. We think that students who start learning programming see programming projects highly complex with many unknowns. We try to use design thinking in introductory programming during the lab sessions.

Teaching introductory programming course is a hassle both for students and teachers. Easing students’ struggles in solving programming projects by design-thinking steps makes a better learning environment.

Each week students attend lab session fifty minutes long, when they are given a project problem to solve. The labs are developed as a learning-by-doing. Students are divided into groups of two students. Each group thinks about the problem for five minutes and then the group reports findings about the setting of the problem and approaches to the solution. In the next step, the group defines more details about the problem and suggests their approach or unknowns. Eventually, the group makes a prototype for the problem and proceeds to the testing phase. This phase results in a new set of findings and questions. Usually the phase is followed by the ideate phase of design thinking and another partial/final solution or prototype. Phases are repeated from the define phase or ideate phase up to the testing phase until the solution to the problem is reached.

During the process of following design-thinking phases students and instructor become vividly aware about the obstacles and different ways of thinking. They follow findings about learning events (errors, controls, tests) during lab sessions. Instructors learn that translating design thinking into actions can work well on individual and group level. The experience builds a foundation for a new didactic approach for the programming course.

Keywords: Computer Science Education, Design Thinking.