Impact of Infusing Interactive and Collaborative Learning in Teaching Introductory Programming in a Dynamic Class

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ABSTRACT

In this era of smart devices, new technologies, gadgets, apps, and numerous systems and services available over online, teaching an introductory programming course by traditional lecture method faces challenges to draw student's attention; especially in their freshman year. In this work, we discuss our experience in teaching an introductory CS course by infusing both interactive and collaborative learning in pedagogy so that students can learn using interactive platforms, tools, technologies, systems, and services as available to them and collaboration within and among groups. For interactive learning, students used an interactive programming environment (e.g. repl.it classroom) as well as online eBooks. We designed several in-class exercises, assignments, small lab-based projects with example codes and expected outputs, and unit tests by using built-in unit tests library. We also, in the middle of semester, introduced collaborative learning through teamwork on well-defined projects during the learning time and submitted at the end. The collaborations include use of basic task management tools and multi-player tool of repl.it that the students can critic, supplement, improve peer works and learn. To evaluate the impact of this infusion, a pre- and post-survey were conducted on student cohort in two different semesters. The initial evaluation of the survey results and performances (final project and final grades) show evidence to conclude that the proposed pedagogical approach increased student motivation and engagement and facilitated learning to entry-level computer science students.

CCS CONCEPTS

- **Education** → Interactive learning environments
- **Computing Education** → Computer education programs → Computer science education → CS1

KEYWORDS

Introductory programming, visual learning, interactive learning, eBook, collaborative learning, interactive programming.

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