

Enhancing C++ Programming Skills through Collaborative Peer Feedback

Marina Svičević

*University of Kragujevac, Faculty of Science, Radoja Domanovića 12, 34000 Kragujevac, Serbia
e-mail: marina.svicevic@pmf.kg.ac.rs*

Aleksandar Milenković

*University of Kragujevac, Faculty of Science, Radoja Domanovića 12, 34000 Kragujevac, Serbia
e-mail: aleksandar.milenkovic@pmf.kg.ac.rs*

Miloš Pavković

*Singidunum University, Danijelova 32, 11000 Belgrade, Serbia
e-mail: mpavkovic@singidunum.ac.rs*

Abstract. Student collaboration is increasingly emphasized in modernized informatics curricula to achieve competency-based learning outcomes. This evolution challenges the traditional individualistic approach in education and requires a revision of assessment practices and feedback to ensure constructive alignment. Considering that project collaboration is particularly emphasized in the field of informatics, significantly affecting later work in industry, it is crucial for students to become familiar with collaborative work during their studies and learn to give and to respond suggestions adequately.

In this study, students initially worked individually on various projects applying basic object-oriented programming concepts in C++. Following this, they were divided into groups of three, where each member reviewed and provided feedback on two projects, encouraging a collaborative learning environment. This setting has proven to provide valuable formative feedback on professional behavior and programming skills in C++, while also presenting the challenge of understanding "foreign code".

Even though 64% of students were new to commenting on other's work and providing suggestions, a remarkable 88% of them later made corrections to their work based on the received feedback. Providing formative peer feedback early and often supports the growth of crucial competencies in informatics education, like self-regulated learning essential for teamwork.

Keywords: peer feedback; object-oriented programming; education; foreign code analysis.

References

- [1] **E. Panadero, M. Alqassab** An empirical review of anonymity effects in peer assessment, peer feedback, peer review, peer evaluation and peer grading. *Assessment & Evaluation in Higher Education*, 2019.
- [2] **J. Warren, S. Rixner, J. Greiner, S. Wong**. Facilitating human interaction in an online programming course. *In Proceedings of the 45th ACM Technical Symposium on Computer Science Education*, 2014, pp. 665–670.
- [3] **Y. Wang, H. Li, Y. Feng, Y. Jiang, Y. Liu**. Assessment of programming language learning based on peer code review model: Implementation and experience report. *Computers & Education*, 2012, 412-422.
- [4] **H. Hämäläinen, V. Hyyrynen, J. Ikonen, J. Porras**. Applying peer-review for programming assignments. *International Journal on Information Technologies & Security*, 2011, 1, pp. 3-17.