

Effective Teaching Coding Standards in Programming Courses

Xiaosong Li

Christine Prasad

Paul Kearney

School of Computing and Information Technology
Unitec Institute of Technology
Auckland, New Zealand
xli@unitec.ac.nz

Coding standards are a set of industry-recognized best practices that provide a variety of guidelines for developing software code. There is evidence to suggest that compliance to coding standards in software development can enhance team communication, reduce errors and improve code quality. Complying with given coding standards is, thus, a vital professional skill required by the software industry; one that ought to be actively developed within tertiary programming courses. The available literature suggests that although most of the software companies have coding standards, individual developers tend not to adhere to them, due to a variety of misperceptions about coding standards, and that in order to ensure compliance to coding standards in industry, a formal implementation process is usually followed.

Most of the programming courses provide coding standards and require students to follow. Usually, one programming language, for example Java, has one common set of coding standards. In a programming course including this language, only a small set of common coding standards have been set forth. The purpose is to introduce students to a representative set of coding standards that are typical in professional programming and to help students develop good style as a habit, which is necessary to successfully complete large programs. Sometimes one programming course has its own coding standards. Sometimes, several programming courses share one set of coding standards. Our teaching is basically following the similar approach. Our observation is that students are reluctant to apply given coding standards.

There are very few reports on how students have achieved in applying coding standards and

what strategies there are to help students attain success. There are some reports on how to implement coding standards in industry. Usually this is a process whereby the developer checks and modifies code by following formal style standards, the standards are enforced during code reviews and design reviews, and the progress data is collected and analyzed last. We propose to do some experiments and practice this process.

A collaborative study is being carried out to find out whether there is a need for a process for implementing coding standards within our programming courses and what suitable teaching strategies can be used for coding standards. The first stage of this study involves using a questionnaire survey to get students' perception of coding standards from three different undergraduate programming courses ranging from level five to seven. The second stage of this study involves using a questionnaire survey to get teaching staffs' perception on how to teach coding standards. We are looking for the answers to the following questions:

- How coding standards are taught?
- Is there any common way to implement coding standards in a programming course?
- How do we assess on coding standards learning?
- Programming has been changed in last several decades. Has the way of teaching coding standards changed in the same time period?
- What subset of coding standards is suitable for teaching? How to determine that?

The results of this study will provide us with a platform to develop suitable teaching strategies for coding standards within our programming courses. This will be useful both to educators of programming courses and also to students who will become future software developers.

