

# Testing Programming Aptitude

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## Abstract.

An initial cognitive study of early learning of programming aimed to extract experimental test data to establish novices' understanding process has been carried out by us [1]. This empirical study was inspired by the notion that different people bring different patterns of knowledge in any new learning process, and demonstrated that how each student tackles the problem in a different way based on their mental model. The initial study suggests that success in the first stage of an introductory programming course is predictable, by noting consistency in use of the mental models which students apply to a basic programming problem even before they have had any contact with programming notation, but the consistency/inconsistency measurement was somewhat subjective. In this paper I present an objective marking method which hope will lead us to more precise and more finely-graduated predictions. This method is being trialed in at least one experiment, and we hope that by the time of the conference I will be able to describe the results.

## 1. Introduction

An initial cognitive study of early learning of programming aimed to extract experimental test data to establish novices' understanding process is described in [1]. We believe that different people bring different patterns of knowledge to any new learning process, and learning programming is not exempted from this common fact. Each student tackles the problem in a different way based on their mental model.

The study started with the hypothesis that "we are able to identify small number of groups to represent novice programmers by looking at their problem solving methods and techniques." We were looking for any sub-populations which are likely to achieve success. Our intention was to observe the mental models that students used when thinking about assignment instructions and short sequences of assignments and we hoped to be able to find out what those models are. We administered a test at the very beginning of their course before the students had begun to be taught about assignment and sequence, and then a second time to the same subjects after the topic had been taught. We correlated the results of these two administrations with each other and we found three groups: consistent using a single mental model (44%), inconsistent using































