

Quantitative Results from a Study of Professional Dispositions

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ABSTRACT

In Fall 2021, a preliminary study was conducted to gain insight into students' perceptions of the importance of professional dispositions to their computing courses and career. Students filled out a pre-survey, post-assignment reflection exercises, and a post-survey. We found that 1) students rated dispositions as being maximally important for the course and their career on the pre- and post-surveys; 2) students rated dispositions not relevant to the course lower than those that were relevant; and 3) students rated their application of dispositions in course assignments lower than they had rated the importance of the dispositions for success in the course in the pre-survey.

Overview of Study and Findings

Professional dispositions are cultivated behaviors desirable in the workplace, such as *persistence* and *adaptability*. Fostering them should be part of every computing educator's goal. In Fall 2021, a pilot study was conducted to assess students' perceptions of the importance of dispositions. At the start of the semester, students filled out a pre-survey in which they rated the importance of five dispositions (*adaptable*, *collaborative*, *persistent*, *responsible*, and *self-directed*) for success in the computing course and their career. After four course assignments, they filled out reflection exercises in which they rated the level to which they had applied these five dispositions and described an instance of applying each disposition. At the end of the semester, they filled out a post-survey that mirrored the pre-survey. In all the surveys, students were provided definitions of the dispositions. We report quantitative findings of the study conducted in two undergraduate institutions: in an upper-level Principles of Programming Languages course in one institution and the introductory Computer Science I course in the other.

Programming Languages: Students ($N = 16$) rated all but *collaborative* as very important for both career and course on both pre- and post-surveys. The median response was 9 or 10 (out of maximum 10). The pre-post difference was statistically significant for both career ($p = 0.02$) and course ($p = 0.03$) only for *adaptability*. For both career and course, the post-survey response was significantly lower than the pre-survey response, i.e., students rated *adaptability* as less important at the end of the course. An explanation is that students did not find that being *adaptable*, defined as adjusting to changes, was necessary for success in the course.

Computer Science I: Students ($N = 35$) rated every disposition except *collaborative* as being maximally important (median 9 or 10) for their career and slightly less so for the course. On *persistent* and *responsible* dispositions, in the pre-survey, no difference was found in students' ratings of importance to their career versus course. In the post-survey, students rated them significantly less important for the course than their career. Students also significantly decreased their rating of the importance of *responsible* for the course from pre-survey to post-survey. An explanation is that after filling out four reflection exercises, students were better attuned to realistically evaluating the importance of dispositions.

In both the courses, on every disposition other than *self-directed*, and after most assignments, students rated their application of dispositions in course assignments statistically significantly lower than they had rated the importance of the dispositions for the course in the pre-survey. So, students admitted applying dispositions less than the importance of the dispositions for success in the course. This is encouraging because acknowledgment of a problem is the first step towards its solution.

A replication study is currently ongoing. In the study, students are being asked to rate how much they identify with specific behaviors associated with the dispositions rather than the dispositions themselves. We expect that this will address the issue of students rating all the dispositions as being maximally important, since behaviors are relatable and may not trigger idealistic responses.

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