Great Expectations: I expect to pass because I already know all this stuff

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Abstract

There is a substantial body of evidence to suggest that students are arriving at university significantly under-prepared to study mathematics, however little appears to have been done to identify students' evaluation of their own abilities in this area, or of their attitudes towards mathematics. We conducted a study recently in three first year mathematics subjects to probe students' perceived ability in several areas of mathematics as well as their expectations and attitudes. Students were also asked about their mathematics background. Surveys were conducted at both the start and end of semester to identify changes in these areas during the semester. Here we report on the results of the survey run in the first lecture at the start of semester to predominantly first semester, first year students. The three first year subjects are all low level mathematics subjects. Most students were enrolled in an industrial design, engineering or science degree.

Forty-eight percent of students enrolled in the units responded to the survey. Many of these were mathematically poorly prepared for university study. Despite this, almost all students had totally unrealistic expectations about their performance in their mathematics subject, including those who reported that their algebra, statistics, trigonometry and calculus skills were weak or non-existent. Almost all students expected to pass the subject, yet the failure rates in the three subjects were all over 30%. A majority of students expected to gain a distinction or high distinction at the commencement of the semester.

We report on several other interesting observations from this survey, including the fact that about 45% of students reported "Okay" to "Excellent" calculus skills, despite the fact that almost 60% of the students had not done any calculus at school or, one assumes, elsewhere. This brings into question how much of the terminology that we take for granted is understood by students.

Overall, students' attitudes to mathematics were very positive; "enjoy", "understand" and "like" were the three most commonly used words (these were rarely preceded by don't or not). Students also expected to gain knowledge and understanding from their mathematics subject.

Whilst interesting in themselves, these results have important implications for the provision of mathematical support at university. Support services are usually designed for students in subjects similar to those surveyed, yet it appears that very few of these students feel that they will have need of such services.