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Chapter VII

Working with Students in Math, Technology, and Sciences for Better Success: One Faculty Member's Experiences

Shirish Shah, Towson University, USA

Tracy Miller, Towson University, USA

Abstract

One teacher, one mentor, one department…these can make a difference in the success of anyone learning difficult material. This chapter highlights formal academic settings and workplace situations, explaining what one teacher, one company or one department has done to be pro-active in serving its learners.

Introduction

Students majoring in mathematics, computer information technology and the sciences tend to be retained at lower rates than students in other majors (Seymour & Hewitt, 1997). Reasons might include the fact that courses in these disciplines take more time than other courses, and also students might feel disaffected and switch to another major.

Often students, particularly women or students who are from racial minorities, believe they lack the skills necessary to succeed, which is sometimes valid (Allen, 1999). This chapter will focus on successful techniques of planning, advising and mentoring that one faculty member has used in several computer science programs, science programs and in private industry (Bernstein, 1997). We will discuss how he managed his classroom as well as how he worked with the agencies requiring the outcomes.

College students comprise the bulk of the students involved in this study. Dr. Shah also has worked with students in government and industry who needed to learn technical or scientific information. Students from Towson University, the College of Notre Dame of Maryland and Villa Julie College were involved in this study. Towson University is a comprehensive university, Notre Dame is a private, women's parochial college and Villa Julie is a private, co-educational institution, all in or near Baltimore, Maryland.

The same methods that have proved effective to help disadvantaged scholars also help the atypical, occasional student. This chapter shows the steps to success in difficult courses (although science, mathematics and computer science are discussed here) and demonstrates, both anecdotally and by statistical comparisons, the results. The chapter is organized in several sections that overview the steps involved in working with math- or science-phobes. The last section concludes the chapter by discussing the evaluation.

Step 1. Assessing the Level of Knowledge

Before teaching anything, a good teacher must know where to begin. Most colleges now mandate placement testing in verbal and math skills to determine