The Relationship between Remediation and Degree Completion for Engineering and Technology Students

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ABSTRACT

This study investigates whether students who initially began college as engineering or technology majors and who were required to participate in remedial mathematics and/or remedial English programs, were less likely to graduate with their bachelor’s degree in their fourth through seventh years, as compared to engineering and technology majors who were not required to participate in a remedial mathematics and/or remedial English programs. By using discrete-time survival analysis, findings suggest that remediation status does not appear to impact the time it takes to complete the requirements for a bachelor’s degree in engineering or technology.

Keywords: Engineering and Technology, Discrete-Time Survival Analysis, Remedial Programs, Time-To-Graduation, Undergraduates

INTRODUCTION

Since the 1980’s, returns on the cost of a postsecondary education have increased, thus causing a substantial growth in the number of high school graduates who attend four-year universities (Bound, Lovenheim, & Turner, 2007; Spellings, 2006; Turner, 2004). Concurrently, the average time needed to complete a Bachelor’s degree has noticeably increased (Bound et al., 2007; Turner, 2004). Although there may be a number of mitigating factors that cause this result, perhaps the most frequently cited reason is that recent high school graduates tend to be less prepared for the academic rigors of a four-year university than students of the past decades (Bound et al., 2007; Greene & Foster, 2003; Turner, 2004).

This phenomenon is occurring in large numbers in the United States, and although occurring less frequently, it is a growing problem in Europe as well (Rienties, 2008; Rienties, Tempelaar, Dijkstra, Rehm, & Gijselaers, 2008). In the United States, remedial programs are common in community colleges as well as four-year colleges and universities, and are a result of post-secondary schools’ desire to at-
tract students from low socio-economic status (Attewell, Lavin, Domina, & Levey, 2006; Brants & Struyven, 2009; Rienties, 2008). In Europe, the need is growing due to the increasing numbers of students completing their secondary education in one country and going on with their post-secondary education in another country, causing increased heterogeneity in these institutes of higher learning (Rienties, 2008; Rienties et al., 2008; Van der Wende, 2003).

According to the Spellings Commission report (2006), a “troubling number” of incoming college students “waste time mastering English and math skills that they should have learned in high school.” This apparent lack of skills in English and mathematics is often indicated in the United States by low scores on standardized tests such as the Scholastic Aptitude Test (SAT), and by students’ poor performance on placement examinations. Although most colleges and universities require that incoming students take placement examinations in order to demonstrate their proficiency in mathematics and English, many students do not do well on these assessments (Bettinger & Long, 2006; National Center for Education Statistics, 2003). The result of poor performances on such standardized measures often leads to the requirement that these students enroll in remedial mathematics and/or English courses for which they do not receive credit towards graduation. Having to participate in such courses restricts their ability to enroll in college-level courses that are required for graduation (National Center for Education Statistics, 2003). Since many programs require courses that have mathematics and/or English skills courses as prerequisites, participating in such courses will likely delay the students’ entry into the required introductory courses for their programs (National Center for Education Statistics, 2003), and subsequently delays them in earning their college degree (Bettinger & Long, 2006).

Remediation at the college level in the United States is widespread, with recent research indicating that at least 40% of all entering freshman are required to participate in at least one remedial course (Attewell et al., 2006). The National Center for Education Statistics (2003) reports that in the fall of 2000, 28% of students entering postsecondary education were enrolled in one or more remedial classes in reading, writing and/or mathematics (Parsad, Lewis, & Greene, 2003). The percentage of students who were enrolled in remedial mathematics was largest at 22%, with only 14% enrolled in writing and 11% enrolled in reading classes. Approximately 60% of institutions that offered remedial classes reported that, on average, students spent less than one year in remediation (Parsad et al., 2003).

Although remediation in the United States has existed since the seventeen hundreds (Merisotis & Phipps, 2000), it was not until the 1960’s that numerous programs were developed at colleges and universities. In Europe, however, very few remedial programs have existed until recently. The passage of the Treaty of Bologna in 1999 gave European students the ability to pursue post-secondary education in a foreign country. As each country has the freedom to determine their own educational goals and criteria for graduation (Van der Wende, 2003), students who take advantage of this opportunity are likely to have gaps in their prior knowledge (Rienties et al., 2008) and as a consequence, European institutions have begun to offer online remediation for these students.

The Spellings Commission report (2006) claims that remedial students waste time taking remedial mathematics and/or English courses, whereas other studies have found that remedial students are less likely to drop out of college once they have successfully completed these courses (Bettinger & Long, 2006). It is believed that remedial courses may increase the perseverance with which these students approach their studies. However, it has been found that remedial students take longer than non-remedial students to complete their degrees (Bettinger & Long, 2006).

Although some studies have researched the time to degree completion for mathematically underprepared versus mathematically prepared students (i.e. Lesik, 2008), differences in degree completion rates for remedial and non-remedial
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