

Improving Biology Performance with Workshop Groups

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This 2-year quasi-experiment evaluated the effect of peer-led workshop groups on performance of minority and majority undergraduate biology students. The workshop intervention used was modeled after a program pioneered by Treisman (1992). Majority volunteers randomly assigned to workshops ($n = 61$) performed significantly better than those assigned to the control group ($n = 60$, $p < 0.05$) without spending more time studying. Workshop minority students ($n = 25$) showed a pattern of increasing exam performance in comparison to historic control minority students ($n = 21$), who showed a decreasing pattern ($p < 0.05$). Volunteers ($n = 121$) initially reported that biology was more interesting and more important to their futures than to nonvolunteers' ($n = 435$, $p < 0.05$). Volunteers also reported higher levels of anxiety related to class performance ($p < 0.05$). The relationship of anxiety to performance was moderated by volunteer status. Performance of volunteers was negatively associated with self-reported anxiety ($r = -0.41$, $p < 0.01$). Performance of nonvolunteers was unrelated to self-reported anxiety ($r = -0.02$). Results suggest elevated anxiety related to class performance may increase willingness to participate in activities such as workshop interventions. In addition, students who volunteer for interventions such as workshops may be at increased risk of performance decrements associated with anxiety. Even so, workshop programs appear to be an effective way to promote excellence among both majority and minority students who volunteer to participate, despite the increased risk of underperformance associated with higher levels of anxiety.

KEY WORDS: group learning; biology performance; minority groups; academic achievement; stereotyped-attitudes.

INTRODUCTION

According to the National Science Board (NSB), the college years are a time of such profound attrition from the sciences that in 1987 they described this attrition as "a grave long-term threat to the Nation's scientific and technical capacity, its industrial and economic competitiveness, and the strength of its national defense" (National Science Board, Task Committee on Undergraduate Science and Engineering Education, 1987, p. 1). Further research identified the primary factors associated with students majoring in the

sciences as (a) participating in the college-preparatory track in high school; (b) taking the most demanding math and science courses; (c) being European American or Asian American; (d) being male; (e) coming from a family with high socioeconomic status; and (f) having a scientist/engineer for a parent (U.S. Congress, Office of Technology Assessment, 1988). Although the number of science and engineering degrees increased until 1996, and has remained level since then (National Science Board, 2002), concerns about the number of scientists working in the United States remain. These concerns center on the increasingly rapid changes in the areas of science and technology and the influence of technology on the economic welfare of the United States as the world's leader in high-tech exports (Doyle, 2002).

The NSB originally suggested two fronts on which to attack the problem of attrition from the

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