



INNOVATION ABSTRACTS

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Validating the Effectiveness of a Prerequisite

It was heart-wrenching to see more than 50% of our Anatomy and Physiology (A&P) students dropping out or failing. They spent hours studying, reviewing, and being tutored, but nothing helped. Students would flock into this course, filling every seat. Often our A&P classes were closed before the start of the semester. But by mid-term, many students were not able to keep up and dropped out. The students simply were not prepared.

Although A&P had been considered a beginning biology course, with no prerequisite, the course required rapid acquisition of basic biology and chemistry knowledge before proceeding with body systems. Instructors, in their desire to retain their students, spent excessive time on these beginning concepts, making the course even more difficult as the semester went on. Everyone was frustrated—students, teachers, counselors, and advisers. A&P proved to be a major stumbling block for many of our students going into health-related professions, particularly nursing.

But that has changed. It was decided that A&P should no longer be considered a beginning course; a prerequisite was needed. We created a course to prepare students from different backgrounds and at all stages of learning to enter A&P, ready to assimilate knowledge at the systems level. We called the new course Human Biology, to distinguish it from General Biology, and provided an assessment exam for students who wished to challenge this new prerequisite. Freed from the need to provide a lengthy review of basic biology and chemistry at the beginning of the course, A&P instructors can now devote more time to higher-level material.

Once the prerequisite was in place, teachers immediately noticed that students were no longer lost in A&P. Success rates were higher, and fewer students were dropping out. However, despite the apparent success, students began to complain and challenge the need for the prerequisite. We heard such comments as: "I had biology in high school"; "I completed my biology at another college"; "I had another beginning course you offered"; "This takes me too long to get through my program"; "I'm a good student, why do I need this

course?"; "Other places don't have this prerequisite"; "You never used to have this prerequisite."

We realized that it was time to address formally the question of whether the prerequisite was truly serving students and helping them succeed in A&P. To evaluate the effectiveness of the prerequisite, we decided to compare attrition rates in our A&P classes before and after the prerequisite was established. In our study we defined attrition as students withdrawing or receiving grades of D or F. We compared attrition rates among beginning biology courses.

For the past four years, all A&P students have taken the prerequisite. In order to determine if taking this prerequisite truly made a difference, we obtained the grades for all A&P students for this past year and compared them to the grades for all A&P students the year before the prerequisite was established. We also obtained the grades for all beginning biology classes for the past year.

Our results show that students now taking A&P or any of our beginning biology courses have a 65%-69% chance of earning a grade of C or better. When we compared our current A&P grade rosters to those before the prerequisite was in place, we obtained astonishing results. Only 46% earned a grade of C or better before the prerequisite was in place. These results indicate a 50% increase in success and a 42% decrease in attrition for the post-prerequisite group (see Table 1). A subset consisting of classes taught by the same three teachers for both sample years was investigated in an effort to control for teacher variability. Within this large subset (over 50% of all classes), the percentages of success and attrition were comparable to the larger group.

We asked: "Are there more students passing since we established the prerequisite?" Using a chi-square test for two independent samples in a 2x2 contingency table, we found that the difference in overall success and attrition rates was statistically significant at the .001 level of probability.

We also looked at grade distribution for the pre- and post-prerequisite groups and found a 44% reduction in withdrawals and D's, a 66% decrease in F's, a 56%



increase in B's, and a whopping 80% increase in A's!

As a result of our study, we believe that taking the Human Biology prerequisite positively affects the success rate of students taking A&P. Students have greater success, their learning environment is enhanced, and retention in their program of study is more ensured.

Now when students complain about having to take the prerequisite, teachers feel justified in assuring them that it is important; several quote the findings of our study. It is convincing to say, "We know you have a 50% greater chance of success if you take Human Biology before A&P, and we really want you to succeed."

In addition, the administration is more willing to allocate time, money, and resources to curriculum development and improvement of the prerequisite course. We believe our study can serve as a model for other college departments wishing to validate the effectiveness of any prerequisite.

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Table 1. Comparison of 16 pre- and 19 post-prerequisite A&P classes in relation to success (A, B, C grade) and attrition (D, F, withdrawal).

Year	#Students	#Success	#Attrition	%Success	%Attrition
Pre	385	177	208	46	54
Post	438	301	137	69	31

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James Tschechtelin, President; and Myrtle Donsey, Vice President; Baltimore City Community College, *Focusing on Retention: Rebuilding an Inner-City Community College.*

Keynote Speakers

Juliet Garcia, President, The University of Texas at Brownsville, *Serving a Diverse Student Population.*

George Boggs, President, Palomar College, (CA); and Immediate Past Chair, American Association of Community Colleges, *Reinventing the Community College.*

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William Moore, Jr., A.M. Aiken Regents Chair, Community College Leadership Program, The University of Texas at Austin, *The Student At-Risk in the Community College.*

Donald G. Phelps, W.K. Kellogg Regents Professor, Community College Leadership Program, The University of Texas at Austin, *A Vision for the Twenty-First Century.*

John E. Roueche, Sid W. Richardson Regents Chair, Community College Leadership Program, The University of Texas at Austin, *Improving Student Motivation.*

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Claire Weinstein, Professor, Educational Psychology, The University of Texas at Austin, *Strategic Learning/Strategic Teaching: A Model for the Twenty-First Century.*



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