PREREQUISITE KNOWLEDGE AND SUCCESS IN HUMAN ANATOMY AND PHYSIOLOGY I

Investigating the Influence of Prior Biology and Chemistry Courses and Knowledge on Student Success in Human Anatomy and Physiology I

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Introduction

Students entering the Human Anatomy and Physiology I course at East Central College are expected to have some prior foundational biology and chemistry knowledge from their prerequisite coursework. The aims of this project were to explore the extent to which prerequisite courses prepared students for A&P, and to investigate whether prerequisite knowledge affects overall course grade.

Methods

PREREQUISITE DIAGNOSTIC EXAM

- An exam over basic biology, chemistry, and math was administered to students at the start of each semester to measure prerequisite knowledge

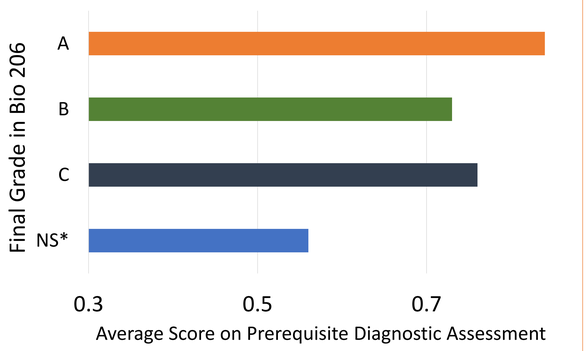
ANALYSIS OF COURSE SUCCESS DATA

- Data from prior semesters were gathered to investigate the influence of prerequisite course on student success

SURVEY OF STUDENT PERCEPTIONS

- Students were surveyed about their perception of the usefulness of their prerequisite knowledge

Figure A. Prerequisite Diagnostic Exam Score and Final Course Grade

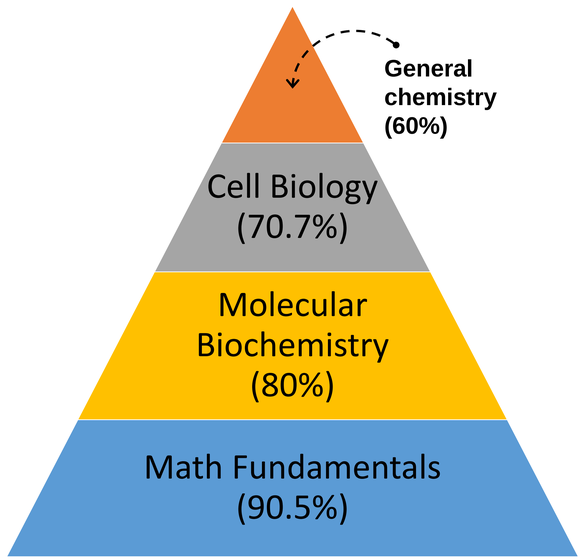


**NS – Not Successful includes grades of D, F, and W*
Counts for each grade were W:2, F:1, D:4, C:13, B: 17, A:6 (43 total)

Results on Prerequisite Diagnostic Exam

- Students scoring low on the prerequisite diagnostic exam were more likely to be unsuccessful in A&PI during the Spring 2022 semester (Figure A).
- Average scores on topics were tabulated to determine areas of overall strength and weakness (Figure B). Data are from the 43 students enrolled in A&PI in SP22.

Figure B. Ranking of Topic Areas by Mean Score on Prerequisite Diagnostic Exam



Prerequisite Course Analysis

- Course Success in Human Anatomy and Physiology I was compared to prerequisite course (Table 1). Semesters included are Fa15 – Sp19.
- Students who took their prerequisite courses at ECC had higher chances of passing A&PI than students who took biology and/or chemistry elsewhere (Figure C).

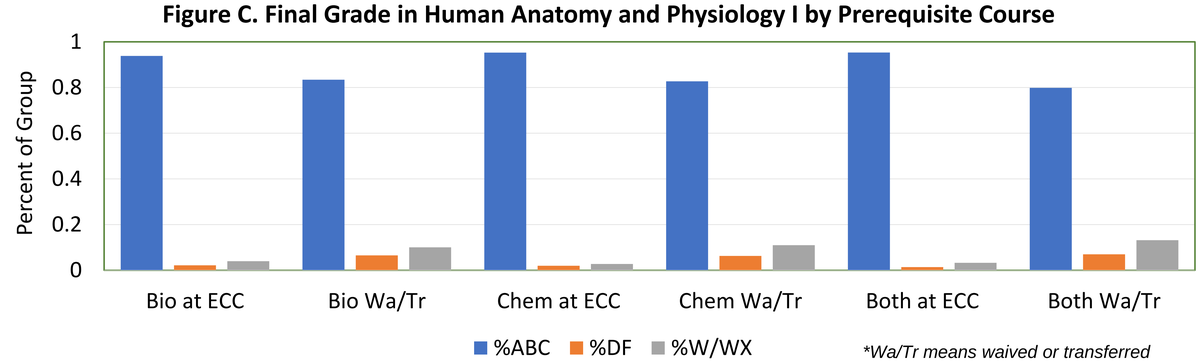
Table 1. Final Grade in Human Anatomy and Physiology I by Prerequisite Course

Prerequisite Course(s)	A/B/C	D/F	W/WX	Count
Biology at ECC	94%	2%	4%	276
Biology Waived or Transferred	83%	7%	10%	169
Chemistry at ECC	95%	2%	3%	254
Chemistry Waived or Transferred	83%	6%	11%	191
Both at ECC	95%	1%	3%	214
Both Waived or Transferred	80%	7%	13%	129

A NOTE ABOUT WAIVERS/TRANSFERS

Our records made it difficult to reliably separate waivers from transfers, so they were pooled. Most students in this category met prerequisite requirements by taking 1 year of chemistry or 2 years of biology in high school.

Figure C. Final Grade in Human Anatomy and Physiology I by Prerequisite Course



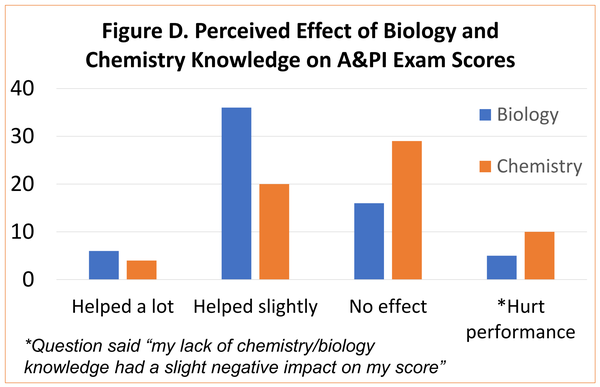
**Wa/Tr means waived or transferred*

Student Perceptions

After each lecture exam in the Spring 2022 semester, students were asked how their chemistry and biology knowledge affected their performance on the exam.

- Students generally perceived their prior chemistry or biology knowledge had little or no effect.
- Perceived effect of biology is higher than chemistry.
- Students never chose the option of large negative impact.

Figure D. Perceived Effect of Biology and Chemistry Knowledge on A&PI Exam Scores



**Question said "my lack of chemistry/biology knowledge had a slight negative impact on my score"*

Conclusions

- Students who start the A&PI course with a low knowledge of chemistry and biology seem to be at greater risk of failure or withdrawal.

  → Provide additional guidance and supplementary coursework

- Students who waive biology and/or chemistry prerequisites based upon high school coursework seem to be at greater risk of failure or withdrawal.

  → Incentivize participation in tutoring services and study groups

- The success of students who take prereqs at ECC implies there is some benefit to prereq knowledge, but this could also be due to age or college experience.
- Students perceive that prerequisite knowledge has little or no effect on their performance in A&PI.

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