Relevant Contributors to Student Success in a Non-Introductory course with a Highly Diverse Student demographic.

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Abstract: Questions and concerns are often raised about effective teaching and learning in a non-introductory course with a very diverse student demographic. This is especially true in the School of Informatics and Computing, where we can, and do, offer a variety of courses that can include Computer Science majors, Informatics majors, and other undergraduate majors from literally any program on the IUB campus. This study seeks to examine whether eventual student success in these diversely-populated course can be attributed to one or more identifiable factors. Is past student success an indicator of success in these courses? Are there other courses taken previously that successful students have all completed? Will examination of the data reveal interesting or unexpected contributing factors to success? Seeking out such predictors or indicators is the purpose of this study.

Project Description:

1. **Purpose:** I teach a number of A290/A590 classes that are in the Computer Science program. All of them focus on specific programming and related skills. All of them are open to Computer Science undergraduates (for credit toward the degree), Informatics Undergraduates (as electives), and to the general IU undergraduate population (as electives). This is a very diverse student population and I would like to use the available data to see if there are any indicators for the success of the students in these courses. I want to investigate whether "successful students" continue to be "successful students," i.e., students who perform well overall also perform well in these courses. Depending on what the data reveals, I would like to investigate other related questions:
    a. Is success related to the student's program?
    b. Is success related to the students class rank in school, i.e., sophomore, junior, senior?
    c. Is success related to having some other, previously taken, course in common, regardless of the student's program? This could include listed but unenforced pre-requisites.
    d. Does success in these courses provide any indicators of the students ultimate success, i.e., graduation?
2. **Impact:** Depending on what this research reveals, we may find that such diversely populated classes do not present any particular challenge to student success. Rather, it may be other factors over which the program, School, or University could make stronger recommendations or exert greater control.
3. **Anticipated Outcomes:** If the data provides evidence supporting specific relationships for success, then the potential outcomes could include:
    a. Evidence that students who complete the preferred, but unenforced, pre-requisites for these courses are more likely to succeed, thereby providing tangible evidence in support of the claim that such prerequisites to indeed contribute to student success.
    b. In addition if this methodology proves successful, it could be applied in other course within the Computer Science and/or Informatics curriculums where similar pre-requisites are listed.
4. **Research Methodology:** I will certainly require guidance in this area, it terms of the available data, how it can be retrieved, and the most effective ways to compare it. I think the Tableau software briefly introduced at the presentation about this program could greatly benefit my research. This would almost certainly require that I work closely with BAR (Bloomington Assessment and Research) from the very start of my work, so I acquire a clear grasp of what is possible with this tool and the data it can be used to analyze and present.

    Based on the examples I have seen, I would anticipate gathering data about as many past students in all of these courses as is available, and then beginning by comparing some basic data points, such as:
    a. Program: Computer Science, Informatics, IU undergraduate (could be further refined)
    b. Student Standing: sophomore, junior, senior
    c. Overall student success via overall GPA and program GPA.
    d. Student success in this/these courses. For the record, the courses in question are:

i. A290/C291/A590: System Programming with C and Unix.
ii. A290/A590: Windows Application Interface Design and Programming with Visual Studio and C#.
iii. A290/A590: Website Interface Design and Programming with Visual Studio, C# and ASP.
iv. A290/A590: Android Application Interface Design and Programming with Eclipse and Java.
v. A290/A590: Introduction to SQL (Structured Query Language).

e. Previous courses in common, especially pre-requisites that were taken and student outcomes in those courses.

I would then need to analyze these data points, and any others that suggest themselves as I am gathering information, so as to map these onto the overall data regarding student success in their program and in the final goal of graduation.

5. **Measure of Success:** I think the initial measure of success will have to be very basic. First, the successful gathering of the relevant data and its' analysis will be a milestone. Second, the discovery or revelation of any patterns or correlations of any sort between the specific data points and overall student success. In this regard, being able to establish either some linkage or correlation or being able to establish no linkage or correlation would have be to be considered a success. At this point, no such substantiated conclusions of this sort exist, to my knowledge, so this is an important potential outcome of this research. If successful, it is possible that one or more testable predictions about future student success linked to completing suggested prerequisites could arise from this research.
6. **Prior Research:** While I have done no formal research on this topic, I have been gathering data in all of these courses in the form of various student "interviews," pre and post course surveys, and other feedback. I would also be interested in investigating whether this data could be used together with the analytic data to make additional predictions about classroom techniques and strategies and their impact on student success. It is my goal with this research to investigate whether any of the conclusions I have drawn from this other data are, in fact, further justified by examining this institutional data using these more formal methods.