

Go Figure! Using Quantitative Measures to Enhance Program and Student Success

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Using quantitative assessment, Montana State University–Billings substantially improved and expanded its developmental education program and learning center during the past five years. Student-centered questions drove the research efforts. By gathering, analyzing and sharing hard data, the department identified unmet student needs, discovered trends, dispelled myths about developmental education students, and added validity to the program while gaining administrative support.

Five years ago, Montana State University (MSU)–Billings reorganized its developmental education program by combining separate math and writing tutoring centers into one comprehensive learning center and creating an administrative team to oversee the learning center and the instruction of three developmental education courses: English 100, Math 101 Introductory Algebra, and Math 105 Algebra for College Students. Under the new structure, the program thrived. The total number of developmental education sections offered increased 40 percent, from 40 sections in Fall 2001 to 56 sections in Fall 2005. In addition to the main learning center, tutoring services expanded to include a learning center on the satellite College of Technology campus in Summer 2004. A partnership with the local public school district resulted in an adult education classroom opening at the College of Technology in Fall 2004. Math 085 Math Fundamentals was created and offered for the first time Fall 2005. Fall 2006 marks the beginning of a developmental education reading course, and an English 085 is being developed for Fall 2007.

In addition to expanding course offerings, the learning center expanded its services from assistance with math, writing, and reading to include tutoring in anatomy and physiology, business, psychology,

foreign languages, accounting, chemistry, physics and other specialty areas for specific majors and programs. Student visits to the main campus learning center average 600 a day. At the College of Technology, student visits to the new tutoring center reached 100 a day after just one year in existence. Both numbers are remarkable considering MSU–Billings’ total enrollment hovers around 4,000, with approximately 1,000 students at the College of Technology.

What lies behind the growth and success of MSU–Billings’ developmental education program and learning center? Quantitative assessment. Facts gleaned from this assessment form the foundation of every decision. Gathering and analyzing data enables the administrative team to identify unmet student needs, discover trends, dispel “myths” about developmental students, and add validity to the program to gain administration support.

USING QUANTITATIVE MEASURES TO IMPROVE SERVICES

In Lewis Carroll’s *Alice in Wonderland*, Alice meets the Cheshire Cat in the woods and seeks direction. After finding out Alice does not care where she goes, the Cat replies, “Then it doesn’t matter which way you walk.” But, retorts Alice, “I want to get somewhere.” “Oh, you’re sure to do that,” smiles the Cat, “if you only walk long enough” (Carroll, 1957, p. 57). Developmental education programs operate on too few resources and have too little time with students to wander through a forest, hoping to get somewhere. As Hendriksen, Yang, Love and Hall (2005) wrote, “...at a time of shrinking budgets, growing enrollments, and changing student demographics, we can no longer assume that we are meeting students’ needs” (p. 57). Using quantitative measures in decision-making not only establishes an end goal, to provide students with the best program possible to prepare them for academic success, but also helps administrators identify which paths to take to achieve those goals, even creating signposts when forks in the road appear.

Without actual figures as a foundation, decisions are nothing more than educated guesses at best and ill-conceived whims at worst. Yet, a survey by Boylan, Bliss, and Bonham (1997) found that only 25 percent of four-year universities engage in a systematic assessment of their programs. When the developmental education program at MSU–Billings reorganized five years ago, the department began gathering data to evaluate the program and make needed changes, resulting in its growth. But, how does one determine what data to gather?

Gathering Data

Deciding what data to gather, like Alice deciding which path to take, begins with knowing the desired outcome. Unlike Carroll's Alice, we know our desired destination. We want to ensure that students receive an opportunity to succeed by having their needs met through developmental education courses. Placing the student, instead of the program itself, at the center of the assessment keeps the result focused where it should be: on providing the best assistance to students. Too often research concentrates on the program or tutoring center instead of the student (Simpson, 2002). Asking questions such as, "Are students prepared for future academic success?" and, "Are the students' needs being met?" places the student at the core of the research.

Using student-centered questions to guide the assessment moves data collection beyond the traditional measures. Historically, studies have measured course completion rates, college retention rates, and grade point averages (Boylan & Saxon, n.d.). However, those measures only capture part of a larger picture. Data collection needs to take a longitudinal look at the student and ask: What can we do to meet student needs before they enter the program, what can we do to help students succeed while they are in the program, and how can we tell if the students have succeeded after they have left the program?

To determine the answer to the first two questions, MSU-Billings relies heavily on the COMPASS placement exam to gather scores in math, writing, and reading during new student orientations, which begin in the spring and continue throughout the summer. In addition to placement scores, we collect information about students' academic standing before, during and after their developmental education experience. To determine if student needs are being met and if students are being prepared while enrolled in the developmental education courses, we collect diagnostic exam scores, gain scores (improvement from pre-developmental education to post-developmental education), midterm grades and final grades. Collecting course withdrawal information and the effects of retention efforts, such as contacting all students who did not attend the first two weeks of class, sending letters to students failing or in danger of failing at midterm, and contacting students who can no longer possibly pass a class prior to the withdrawal deadline, provides information about student retention.

A student's performance after completing developmental education

courses measures a program's true effectiveness. Post-developmental education course grades; future academic standing, such as probation, suspension, and honor roll; graduation rates; and student honors and awards help answer the final question: Are students succeeding after they leave the program? At many universities and colleges, a statistician or student database already holds much of the information needed for analysis. If such resources are not available, databases and spreadsheets can be created using standard software packages, such as Excel®.

Analyzing Data

“Number-crunching” remains the first step in analyzing data after it is collected. Calculating percentages, such as the percentage of students withdrawing or receiving Ds and Fs, reveals what happened in a particular course during a particular term. However, data analysis needs to address the “why” as well. As Simpson (2002) states, the “why” question digs at the reason, the underlying cause that can be changed to improve student success. For example, examining the percentage of students not successfully completing a course leads to the question, “Why are these students not succeeding?” Administrators, educators, and researchers can then begin to look for information that can answer the deeper question. For example, did those students not succeed because of lack of ability or poor attendance? What were those students' placement scores? What was their attendance behavior: Did they attend class regularly; did they stop attending after midterm? One analysis leads to another, creating a pathway that can lead to changes.

Enhancing Program and Student Success

Collecting data and endeavoring to answer the “why” questions while analyzing the data improves the program by identifying unmet student needs and justifying program changes. At MSU–Billings, the combination of questions asked and data gathered led to a close scrutiny of placement scores. Were the placement scores appropriate for our population? Analyzing pre- and post-developmental education placement scores and course completion data showed that certain portions of students were not successfully completing the courses. As a result, we adjusted the placement scores and created additional courses.

Specifically, in both math and English, the lowest-scoring students were not passing the developmental English 100 or Math 101. We compared placement exam scores to course grades and found a correlation existed.

Not surprisingly, the higher the placement score, the better the grade. However, we found a certain placement score below which virtually no students passed the courses. Also, to better serve the students, we created a partnership with the school district and opened a satellite adult education classroom on the College of Technology campus. Advisors directed students scoring below a 23 on the writing portion of the COMPASS placement exam to adult education to improve their skills before attempting English 100. On the math side, advisors directed students scoring less than a 35 on the pre-algebra portion of the COMPASS exam to adult education. Thus, the very low-performing students could increase their skills for free with adult education before attempting the developmental education courses and improve their capacity for success in those courses. In addition, we created a Math 085 course to instruct students scoring between 36 and 100 in pre-algebra or 0 to 15 in algebra to better prepare them for success in the Math 101 course. We also increased the placement score to enter Math 105 from a 21 to a 27 COMPASS algebra score, effectively placing more students in Math 101. Students scoring between 21 and 27 proved more likely to fail Math 105 without completing Math 101 first. They were not yet prepared for the coursework. After adjusting the math COMPASS entrance scores, the standard deviation of improvement in the math classes decreased, meaning more students were experiencing the same amount of improvement.

An examination of student gain scores revealed the need for a lower level English course, English 085. The standard deviation was much greater for English 100 than the revised math courses. Students in English 100 were not consistently improving their performance. Why? Without English 085, students scoring a 23 on the writing portion enrolled in the same English 100 classes as students scoring an 86 (an 87 is required for entrance to a non-developmental education English 150 course). Instruction geared to preparing students for English 150 left many lower-performing students behind. Struggling students needed more basic grammar and sentence structure instruction, while the majority of the class engaged in writing essays in specific formats. Work began on developing an English 085 course to meet those students' needs.

An analysis of the completion rates and retention efforts revealed the need to direct extra attention to one particular group of students: those attempting multiple times to pass a course. Students enrolled in courses

for the second or third time seemed to be more resistant to intervention efforts than were those attempting the course for the first time. For example, a lower percentage of multiple-attempt students responded to midterm warnings than those enrolled in the class for the first time. The multiple-attempt students were more likely to receive a failing grade even though they had been through the course before. The data also revealed that early intervention worked best. The earliest interventions succeeded more often than subsequent efforts. Combining those two pieces of information led us to add personal phone calls and “hall visits” with multiple-attempt students early in the semester instead of just sending the standard letters.

Another example of using quantitative assessment to identify and meet student needs started with a student-centered “how” question. How were students with low reading scores performing? The university had collected COMPASS reading scores but had not analyzed the data. Statistical calculations revealed a positive correlation between reading score and GPA. In addition, by comparing reading scores to retention data, such as persistence semester to semester, GPA, and academic standing, we found students who scored below an 80 on the COMPASS reading exam were significantly more likely to experience academic failure after the first year than students who scored above an 80. Because we had the objective data, the university’s administration approved the implementation of a reading course designed to help students improve their college reading ability and performance. We had more than a “hunch” and more than instructors’ anecdotal comments about their students’ poor reading abilities to justify the expense of a new course.

Sharing Data

After gathering and analyzing data, the last step in using quantitative assessment to enhance program and student success is to share the data. Share the information with instructors, tutors, and administrators. Help them see the importance and success of developmental education. Dispel myths by sharing the information with other academic departments, especially those who matriculate with the program. Build support by sharing the information with other support services: advising, housing, campus security, financial aid, and other student programs. The advising staff, for example, appreciates the tracking of multiple-attempt students. Housing and financial aid personnel display particular interest in students’ attendance patterns.

Furthermore, the importance of using quantitative assessment to gain administrative support cannot be overstated. When the battle begins to rage between departments for funding, when universities stretch to increase retention efforts, when dollars and jobs are on the line, departments built on a bedrock of quantitative assessment can withstand the buffeting squalls and torrents. When certain university factions declared MSU–Billings’ developmental education department was not adequately preparing students for subsequent classes, we dashed that misconception by rolling out the numbers: 52 percent of students with a previous developmental education math course achieved a C or better in subsequent math courses compared to 48 percent of students in the same courses who had not taken a developmental education math course. In addition, 55 percent of students with a previous developmental education English course achieved a C or better in the non-developmental education college composition class compared to 45 percent of students without a developmental education English course.

Hard facts dispelled other myths. Opponents said developmental education students could succeed at the developmental education level, but they could not survive through graduation. Again, because we had been gathering and analyzing data, we could show that 18 percent of the bachelor and post-bachelor May 2005 graduates had completed at least one developmental education course. The number rose to 21 percent when the master degree candidates were removed. In fact, not only did these students survive, they thrived. For the May 2005 commencement exercises, 57 percent of students nominated for student awards had enrolled in at least one developmental education course during their academic careers; furthermore, 26 percent of the students who earned individual awards had enrolled in at least one developmental education course. The 2005-2006 vice president of the student senate began his academic career as a developmental education student, and the 2006 student senator for the College of Technology previously completed developmental education math and English courses. The data showed that developmental education students survive, thrive and benefit the university community when provided with the necessary foundation.

CONCLUSION

Having the data builds credibility. Using the data builds a better program and improves student success. The high ranking achieved by

the Academic Support Center on a recent campus-wide Noel-Levitz student satisfaction survey highlighted the program's success. During a recent accreditation committee meeting, the committee chair noted the quality of the quantitative assessment conducted by the developmental education department and urged other departments to follow suit. Carefully gathering, analyzing and sharing data paves a program's path through the somewhat dense and often tangled developmental education forest of identifying and serving diverse student needs. As we say, "If the numbers are right, you can't go wrong."

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