HAZARDOUS CONDITIONS AHEAD: ROADWAYS TO ACADEMIC SUCCESS ARE RIDDLED WITH POTHOLES, SINKHOLES, AND SHARP TURNS

Center for Institutional Effectiveness
October 6, 2004

All roads to the baccalaureate degree are paved with challenging required coursework. Many who start their collegiate journeys on these demanding roadways fail to complete them successfully. Despite our best efforts to be supportive by expanding driver education programs (Orientation, KSU 1101, etc.), establishing service stations along the way (CAPS, math lab, writing lab, peer counseling, etc.) or traveling together in groups and caravans (CLASS, discipline-oriented learning communities, cohorts, study groups, etc.), completing the journey (academic success) remains elusive for many. Perhaps we are overlooking the most basic and formidable challenge of all -- the hazardous condition of the roadways themselves. Roads riddled with deep potholes, expansive sinkholes and sharp turns (killer courses, wide-ranging difficulty levels among course sections, tough A's, easy A's, etc.) may be impossible for many students to traverse successfully, regardless of the preparation and support they receive for the journey. Straightening, leveling, and repairing the roadways that students must travel could be a powerful and productive strategy for improving learning outcomes and academic success at KSU.

Passing required courses with at least a grade of "C" is fundamental, and in most instances, essential for students to succeed academically and complete a degree program at KSU. Students encounter many obstacles to such academic success, some of which are clearly beyond the realm of the university's influence. Other obstacles, however, are set and controlled largely by the university and its faculty. Chief among those are the academic demands of required coursework. Despite the many ways that the demands of coursework can be managed and controlled by the university and its faculty, courses vary widely in their levels of difficulty and challenge. Some courses are much more demanding and difficult to pass than others. Surprisingly, some sections of the same course are many times more demanding and difficult to complete successfully than other sections.

A comprehensive strategy for improving student success, especially in the early years of the college experience, must include a fundamental awareness of the different levels of academic challenge that exist among required and common lower division courses. The following analysis of final grades earned in General Education, Learning Support and KSU 1101 courses for Fall 2003 and Spring 2004 is intended to raise our awareness about these existing challenges to the academic success of KSU students. This analysis should elicit questions about the effectiveness of what we are doing, or not doing, to assist freshmen and sophomores in overcoming the academic challenges of their college coursework successfully. It has implications for critical and constructive reviews of the upper division roadways to degree completion, as well.

Which are the "Killer" Courses in General Education at KSU?

Courses that are exceptionally challenging to many students and are very difficult to pass are commonly referred to as "killer" courses. Such courses often have an especially negative impact on and can "kill" a student's grade point average, HOPE scholarship eligibility, enthusiasm for collegiate studies, interest in remaining in college, and self-confidence as a college student. Often these are not only difficult courses to pass, they are also courses in which it is very tough to earn the top grade of "A."

Frankly, any course of study that a student does not pass with a final grade of "C" or better could be regarded as a "killer" course by that student. By that definition, 26% (one out of ever four) of the registrations in KSU's General Education and Learning Support courses in 2003-04 were "killer" experiences that resulted in the discouraging outcomes of a "D," "F," "WF" or "W" final grade. Stated differently, out of about 50,000 course registrations in General Education last year, roughly 13,000 ended in a very disappointing, unproductive, and unsatisfactory manner for our students. As Table 1 indicates, no corner of the General Education curriculum was immune to such disappointing results. However, it is also quite clear from the numbers in Table 1 that some courses of study in General Education were much more challenging than others to the academic success of KSU students. Some clearly appeared to be "killer" courses for many students.

Calculus Sequence Tops the List of KSU's Killer Courses in General Education

The data in Table 1 confirm that courses of study in calculus-oriented mathematics were notably more challenging and difficult to pass than any other course of study in the General Education program at KSU. Almost half of the students who enrolled in the applied calculus course for business majors and nearly half who enrolled in the precalculus and first calculus course for science and technology programs failed to earn a final grade of "C" or better in those courses. In contrast, only one-fourth of the total number of students enrolled in all General Education courses were similarly unsuccessful. Furthermore, many of the degree programs that build upon the fundamentals of the calculus (business, biology, computer science, information systems, etc.) are among the most popular at KSU. Consequently, the negative impact of such unsatisfactory course completions was extensive and equated to nearly 2,000 unsuccessful course attempts in 2003-2004. Calculus-oriented mathematics appears to be a highly frustrating obstacle to the academic success of many prospective business, science, and technology majors early in their academic experience at KSU.

Table 1

DIFFERENCES IN THE VOLUME OF DISAPPOINTING FINAL GRADES ACROSS THE COURSES OF STUDY IN GENERAL EDUCATION AND LEARNING SUPPORT AT KSU IN 2003-2004

Courses of Study in General Education and Learning Support	D, F, WF, W Grades Awarded	
	Percent	Number
Calculus-oriented Mathematics	44%	1,932
Introductory Chemistry	36%	762
Introductory Economics	32%	1,255
Foreign Languages (1002 level)	32%	255
Philosophical Thinking	31%	381
Introductory Physics	30%	159
Math Modeling & Statistics	27%	1,240
Interdisciplinary Science	27%	1,217
American Government	27%	1,012
World & US History	24%	1,182
Arts Appreciation	21%	687
Social Issues	20%	512
English Composition & Literature	17%	1,598
Communication Fundamentals	14%	175
Freshman Seminar	13%	157
Learning Support in Algebra	17%	186
Learning Support in Writing & Reading	12%	42
GRAND TOTAL IN GENERAL EDUCATION & LEARNING SUPPORT	**26%**	**12,752**

*Lab sections in the sciences are not included. Data Source: Grade Distribution drill down tool at ir.kennesaw.edu

All Math Courses in General Education Are Not Among the Most Challenging

As is indicated in Table 1, mathematical modeling and statistics, which form the alternative mathematics sequence to the calculus-oriented courses in General Education, pose substantially less of an obstacle for student success than the calculus. The proportion of students who do not earn at least a "C" in mathematical modeling and statistics was 27% in 2003-04, which is close to the KSU norm of 26% for all General Education courses combined.

That was not true twenty years ago when KSU's course in College Algebra was, like the calculus, a major obstacle that many students could not negotiate successfully. After receiving more than 10 years of NSF and FIPSE funding for R&D on alternative approaches for effectively teaching college algebra, the Mathematics Department shifted from a reliance on the traditional college algebra course to a progressive mathematical modeling course for teaching algebra in an applied perspective for KSU's General Education program. Research evaluating the effectiveness of the two approaches to teaching algebra revealed that students experienced comparable gains in knowledge and use of algebraic concepts, but were more satisfied with the usefulness of what was learned and were less averse to taking more courses in mathematics after completing the course in Mathematical Modeling.

Science Majors Are Hit Doubly Hard by Chemistry and Calculus

In addition to encountering the challenge of the calculus, a little more than a third (36%) of all students who registered for one of the introductory chemistry courses that are required for majors in the sciences failed to earn a final grade of "C" or better. A little over 750 students experienced that discouraging outcome in 2003-04. As is indicated in Table 1, these introductory chemistry courses are substantially more difficult to pass than most other courses in the General Education program at KSU and are second only to the calculus-oriented courses as the most challenging to pass.

Ironically, students who pursue majors in the sciences in college were probably more interested and better prepared in mathematics and science in high school than most of their contemporaries. However, their lack of success in KSU's college calculus and chemistry courses is substantially greater than the norm for most other KSU students who pursue the interdisciplinary science sequence or the mathematical modeling/statistics options in General Education.

All KSU Students Encounter an Above Average Challenge in Economics

Regardless of the option selected, nearly a third (32%) of the students who registered for the required introductory economics course in General Education failed to earn a final grade of "C" or better. Over 1,250 students experienced that discouraging outcome in 2003-04, making this course of study the third most challenging to pass on KSU's list of required courses in General Education.

Courses Involving Learning of a New Language Are Also Among the Most Challenging to Pass

Nearly a third of the students who attempted to complete the 1002 level of a foreign language also failed to earn a "C" or better in 2003-04. Because FL 1002 is one of three electives for satisfying one of the General Education requirements, the number of students negatively affected totaled only 250 in 2003-04. From a related perspective, all

four of the most challenging courses of study in General Education involved "learning a new language." It could be argued that the calculus is a particularly challenging language to learn as are the quantitative and symbolic languages of study in chemistry and economics.

Courses Where the Risk of Not Passing is Less

If the norm for not earning a "C" or better in General Education is close to 26% of all registrants, then there were several courses of study where the risk of not passing was substantially below that norm. Those courses of study are listed in the bottom third of Table 1 and include arts appreciation, social issues, English, communication, the freshman seminar, and learning support. In 2003-04, fewer than 200 students experienced the disappointment of not passing courses in human communication, the freshman seminar, or learning support with a "C" or better. In contrast, ten times more students did not pass the calculus-oriented courses. (See Table 1.)

A Substantial Lack of Academic Success at the Norm

The proportions of students who did not earn a grade of "C" or better in their General Education courses of math modeling/statistics, interdisciplinary science, government, and history were close to the norm of 26%. Nevertheless, over 4,500 students did not meet the challenge of those courses successfully in 2003-04. When the 1,600 students who failed to earn a passing grade in English are added in, nearly half of the grand total of unsuccessful outcomes in 2003-04 were accounted for by these five core areas of study in General Education.

Astonishing Differences in Academic Challenge Exist Among Sections of the Same Course

Regardless of whether the courses were among the most challenging to pass in the General Education program or the least challenging, different sections of the same course ranged widely in their proportions of D, F, WF, or W grades in 2003-04. Most courses had one or more "killer" sections. The range of passing rates among course sections was often astonishing. For example, in Elementary Applied Calculus which is one of the most difficult courses to pass, the proportion of disappointing final grades extended from a low of one out of every ten students in one section to a high of nine out of every ten students in another section. In ENGL 1101, which is among the least challenging courses to pass, "killer" sections existed as well. For that course, disappointing final grades ranged from a low of none in one section to a high of eight out of every ten students in another section. These data underscore the presence of "killer" course experiences in all corners of the General Education curriculum. (See Table 2.)

Table 2

RANGE OF DIFFERENCES IN THE VOLUME OF DISAPPOINTING FINAL GRADES AMONG THE SECTIONS OF SELECTED GENERAL EDUCATION COURSES AT KSU IN 2003-2004

Selected Course in 1003-2004	D,F,WF,W Section Grades Highest %	Lowest %
Selected Courses Among the Most Challenging to Pass in General Education		
MATH 1106 Elementary Applied Calculus	89%	11%
MATH 1113 Precalculus	78%	13%
MATH 1190 Calculus	67%	17%
CHEM 1211 General Chemistry	56%	22%
CHEM 1212 General Chemistry II	50%	30%
CHEM 1151 Survey of Chemistry I	74%	20%
CHEM 1152 Survey of Chemistry II	47%	24%
ECON 1100 Global Economics	40%	0%
ECON 2100 Principles of Microeconomics	44%	14%
Selected Courses Among the Least Challenging to Pass in General Education		
KSU 1101 Freshman Seminar	43%	0%
COM 1109 Human Communication	38%	0%
ENGL 1101 Composition I	79%	0%
ENGL 1102 Composition II	58%	0%
ENGL 2110 World Literature	44%	3%

* Lab courses in the sciences not included. Data Source: Grade Distribution drill down tool at ir.kennesaw.edu

Which are the "Easy A" and "Tough A" Courses in General Education?

The proportion of lower division students who earned an "A" in a General Education or Learning Support course ranged broadly in 2003-04 from a low of 12% in ECON 2100 Microeconomics to a high of 61% in KSU 1101 Freshman Seminar. At one end of that continuum, there were almost a dozen courses where the most frequent passing grade awarded was an "A." At the other end, there were almost a dozen courses where the least frequent passing grade awarded was an "A." Several (but not all) of the former are likely to be called "Easy A" courses and several of the latter will probably be known as "Tough A" courses in KSU's General Education program. (See Table 3.)

Table 3

GENERAL EDUCATION COURSES THAT COULD BE CONSIDERED THE "EASIEST A's" AND "TOUGHEST A's" IN 2003-04

Course in General Education or Learning Support		Percent A's Awarded
Most Frequent Passing Grade was an "A" in This Course		
KSU 1101	Freshman Seminar	61%
PSYC 2105	Social Issues - Psychology	58%
READ 0099	Learning Support - Reading	45%
ART 1107	Arts in Society - Visual Art	41%
SOC 2105	Social Issues - Sociology	40%
MATH 0099	Learning Support - Elem/Interm Algebra	40%
THTR 1107	Arts in Society - Theatre	36%
MATH 1101	Mathematical Modeling	35%
MUSI 1107	Arts in Society - Music	34%
MATH 1107	Elementary Statistics	32%
Least Frequent Passing Grade was an "A" in This Course		
ECON 2100	Principles of Microeconomics	12%
ANTH 2105	Social Issues - Anthropology	14%
CHEM 1152	Chemistry Survey II	14%
MATH 1106	Elementary Applied Calculus	18%
MATH 1113	Precalculus	18%
POLS 1101	American Government	18%
ECON 1100	Global Economics	19%
SCI 1101	Interdisciplinary Science	19%
HIST 1110	World Civilization	20%
GEOG 2105	Social Issues - Geography	23%

*Lab courses in the sciences not included. Data Source: Grade Distribution drill down tool at ir.Kennesaw.edu

In cases like KSU 1101 and PSYC 2105 where more than half of the registered students received an "A" grade in 2003-04, the "Easy A" label appears to fit readily. On the other hand, students who were in the top third of the registrants in MATH 1101 or MATH 1107 would probably not agree that earning an "A" was easy in those courses even if A's were slightly more plentiful than B's or C's. However, it is also fair to say that those A's may have been easier to earn than the top grades awarded in the calculus-oriented options in General Education.

Not surprisingly, the "Tough A" courses with the lowest percentages of A's, were typically associated with the "killer" courses reviewed earlier in this report (i.e., calculus, chemistry, and economics). Not only were these courses exceptionally challenging to pass, they were also extremely difficult to negotiate successfully for the top grade.

It is also interesting to note that not all elective options in General Education carried the same potential for earning "A's." For example, of the four course options for satisfying the social issues requirement, two (ANTH 2105 and GEOG 2105) were on the "Tough A" list, and two others (PSYC 2105 and SOC 2105) were on the "Easy A" list. Clearly, among the four social issues course options, the potentials for successfully earning the top grade were wide ranging in 2003-04.

Suggested Focal Points for Improvement of Academic Success

Maintaining a 2.0 ("C") GPA and completing courses toward a degree with a "C" or better grade are fundamental for academic success as well as retention and graduation. When one out of every four or 13,000 course enrollments in General Education during the academic year terminate without a final grade of "C" or better, good standing and academic success can quickly be at risk for a substantial number of KSU's lower division students early in their collegiate experience.

Certainly, expanding and strengthening the university's support programs and services designed to enhance student success are important initiatives at KSU. However, it may be equally if not more important for the faculty to examine directly the academic obstacles to successful course completion. Our collective goal should be to reduce unsatisfactory course outcomes and increase academic success, without sacrificing appropriate academic standards. Unless more students complete more of their required courses of study successfully and achieve at high levels, significant numbers of them will continue to be at risk of not learning, not remaining at KSU, not graduating, and not attending college elsewhere.

Both the "killer" course experience and the "easy A" can undermine the genuine academic success of our students. Both deserve the faculty's concentrated attention for improvement. Both phenomena appear to exist throughout the KSU curriculum, so no area of academic study should be exempt from a critical review for improvement. Admittedly, some disciplines will need to give more attention to killer courses than easy A's. The opposite may be true in other disciplines. Overall, there may be more "killer" course experiences than "easy A" course experiences needing attention in the General Education program. In some upper division degree programs, the opposite may be true. (See Grade Distribution drill down tool at ir.kennesaw.edu.)

Early in this report, an assertion was made that the teaching and administrative faculty are largely responsible for determining the demands and difficulty of KSU's coursework. After all, we control: 1) the nature and rigor of course completion requirements; 2) the measures used for evaluating students; 3) the performance standards for passing courses; 4) the distribution of final grades; 5) the instruction provided to facilitate student learning; 6) the admission, placement, and prerequisite requirements for course registration; 7) the provision of supplemental academic assistance and support services outside of class; 8) the advisory information and guidance concerning student readiness

for course entry; 9) the linkages of course experiences to a program's learning outcomes; and 10) the general expectations about whether students can and will successfully complete courses.

Each of these ten factors constitutes an important domain for constructive change that could improve satisfactory course completions and the academic success of our students. Several of those factors pertain to choices we make in structuring effective learning experiences and course requirements. Some relate to the support and effectiveness of the larger context in which our courses are offered. Others pertain to our philosophies of teaching and learning and our professionalism as educators. Comprehensive attention directed at all ten of those factors is more likely to produce a powerful and positive effect than focusing on only a few of them.

The wide-ranging difficulty levels and passing rates among different courses, especially among different sections of the same course, constitute an especially important focus for the faculty's critical review and constructive correction. While some variability among courses and sections is quite appropriate and unavoidable, extreme variation is often hard to understand and impossible to defend. Substantial work needs to be done to improve the consistency of course difficulty across sections of the same course and throughout the curriculum. Our students deserve a more level playing field that offers reasonable equality of opportunity to achieve their educational goals, regardless of the courses and sections they must take.

In addition, reflections on the fundamental tenets of our philosophies of teaching as university professors should be a focal point of our conversations and deliberations about these matters. Do the data on course outcomes reflect a professional commitment to being "effective facilitators of learning" for all who are serious students or do they suggest adherence to the premise that it is the job of college professors to be gatekeepers who "teach the best and shoot the rest"? Do we challenge our students in ways that effectively stretch and expand their learning, or do we set the bar so high that many students with potential to succeed cannot and do not? Do the learning experiences we design for our students contain effective levels of healthy stress and constructive challenge or are they so demanding that the result is excessive distress and destructive learning outcomes? Do we expect many of our students to succeed in our courses or do we expect many to fail, and is that the fundamental expectation a self-fulfilling prophesy? In what might appear to be an "easy A" course, are many students truly performing at the highest level of academic achievement or did we set the bar too low and fail to help our students achieve their full potential as learners?

Exploring these and the other factors through which we control the academic challenges of required coursework is vital to the future success and quality of Kennesaw State University. Neglecting to give concentrated and corrective attention to the basic and formidable obstacles to student success throughout the curriculum is tantamount to not repairing hazardous potholes, sinkholes, and sharp turns in the roads that our students must traverse during their collegiate journeys in search of academic success. Clearly, there is much important roadwork to be done if we are serious about facilitating learning and the academic success of our students and our university.