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peerReview

Emerging trends and key debates in undergraduate education

Student Preparation, Motivation, & Achievement

A publication of the Association of American Colleges and Universities

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Cover Illustration by Dave Cutler for peerReview.

While I often take my work home with me, recently I have had work-related matters greet me at my front door.

Every day this month, stacks of letters and brochures from a variety of colleges and universities have arrived in the mail for my son Adam, a high school sophomore. In addition to these mailings, he has also received well over sixty e-mail messages from college admissions offices. Adam took the PSATs last fall and he received his scores early this year. Judging from the timing of the mail he has received, Adam's information also was given to a number of institutions who deemed him to be a potential candidate for admission to their schools. It has been exciting for him to review the correspondence. For the first time, he can envision himself as a college student. However, I wonder if these schools are missing an important opportunity. These targeted mailings could provide Adam and his fellow students who are contemplating college choices early in their high school years with the chance to take academic inventories of where they are and where they want to go. **The recruitment materials could help students assess their own progress in preparing to achieve the essential learning outcomes of a liberal education—the world's premier design for college learning.** Unfortunately, none of the correspondents have offered this type of measuring stick for college preparation. Instead, the recruitment materials have focused on what is available for admitted students, often emphasizing school location and other non-academic features of the campus.

There is no question that adequate preparation is key for successful transitions from high school to college learning. But how prepared is the typical student when he or she arrives on campus the first year? In a series of focus groups conducted for the Association of American Colleges and Universities (AAC&U) by the Peter D. Hart Associates with several groups of rising college juniors and seniors at public and private institutions, participants spoke of their hopes, goals, concerns, and expectations regarding college. When asked about their freshman year, many students recollected that they felt unprepared and unaware of what to expect of college. A number of those questioned who had exposure to college-level courses while in high school indicated that they felt "unprepared for the demands of some college classes, despite having taken AP classes in that field of study."

This year, the National Leadership Council for AAC&U's Liberal Education and America's Promise (LEAP) initiative released a report called *College Learning for the New Global Century.* The LEAP report identifies the essential aims, learning outcomes, and guiding principles—including seven Principles of Excellence—for a twenty-first-century college education. The Principles of Excellence are "informed by a generation of innovation and scholarly research on effective practices in teaching, learning, and curriculum [and] offer both challenging standards and flexible guidance for an era of educational reform and renewal." The second guiding principle, "Give Students a Compass," is especially meaningful in this discussion of student preparation. A compass that allows students to find their academic bearings and gives them a sense of what they are aiming for—as high school sophomores or college seniors—also would empower them to make smart educational decisions throughout their academic careers.

This edition of *Peer Review* addresses the topic of student preparation and two equally important factors that are essential for student progress—motivation and achievement. The issue features a range of articles that explore the relationship between these three determinants and relevant promising practices. As the cover of this edition illustrates, the undergraduate path is filled with choices. As students create their courses of study, their preparation, motivation, and achievements throughout their education will allow them make the most of their journeys to commencement and all of their future endeavors.

—SHELLEY JOHNSON CAREY

To read more about the new LEAP report, see page 26 in this issue of Peer Review. *To listen to the podcast of the AAC&U plenary "Taking the Lead on What Matters in College: Principles of Excellence for the New Global Century," go to www.aacu.org/Podcast/AM07_podcasts.cfm.*

What Student Engagement Data Tell Us about College Readiness

By George D. Kuh, director of the Center for Postsecondary Research and Chancellor's Professor of Higher Education, Indiana University

Good things go together. Students who talk about substantive matters with faculty and peers, are challenged to perform at high levels, and receive frequent feedback on their performance typically get better grades, are more satisfied with college, and are more likely to persist. While these and other educationally purposeful activities are positively linked to desired outcomes for *all types of students*, historically underserved students and those who are less well prepared *tend to benefit even more* (Cruce et al. 2006; Kuh et al. 2006). But for many reasons, large numbers of students do not devote enough effort to these and other important activities, though they are capable of doing so. As a result, many leave college and never return to try again. To increase the odds that students will survive and thrive in college, we need to know more about the precollege experiences and dispositions of students who are less likely to engage and induce those students to participate in demonstrably effective programs and practices.

This paper summarizes selected findings about student preparation and motivation to succeed in college, drawing on student engagement surveys and recent studies conducted by the Indiana University Center for Postsecondary Research. The best known and largest of these projects is the National Survey of Student Engagement (NSSE), which has been used by about 1,100 different four-year colleges and universities in the U.S. and Canada. I also briefly discuss why potentially "high-impact practices" promise to promote student engagement and help students attain the learning and personal development outcomes essential for the twenty-first century (AAC&U 2007).

How Ready Are Students for College?

The hard truth is that success in college is strongly related to precollege academic preparation and achievement as well as other factors such as family income and parents' education (Kuh et al. forthcoming). Students who do not attain grade-level proficiencies in math and reading by the eighth grade are much less likely to be college-ready at the end of high school. And if students do not do well in English and advanced mathematics classes (such as algebra II, precalculus, trigonometry, and calculus), interventions later usually have only modest effects on their chances to complete a baccalaureate degree. Along with college-level academic skills, high school students must also develop study habits and other behavioral patterns associated

High School Survey of Student Engagement (HSSSE):
www.indiana.edu/~ceep/hssse

College Student Expectations Questionnaire (CSXQ):
www.indiana.edu/~cseq/csxq_generalinfo.htm

College Student Experiences Questionnaire (CSEQ):
www.indiana.edu/~cseq

Beginning College Survey of Student Engagement (BCSSE):
www.bcsse.iub.edu

National Survey of Student Engagement (NSSE):
www.nsse.iub.edu

Community College Survey of Student Engagement (CCSSE):
www.ccsse.org

Faculty Survey of Student Engagement (FSSE):
www.nsse.iub.edu/fsse

with postsecondary success. Once students start college, engaging in effective education practices can increase their chances for success.

The Past is Prologue: High School Experiences

Like NSSE, the High School Survey of Student Engagement (HSSSE) collects data about the extent to which high school students engage in a range of productive learning activities. Results so far point to a sobering conclusion. Although the vast majority of high school seniors (more than 90 percent) say they intend to go on to postsecondary education, many do not engage in the kinds of educational activities that will prepare them to do well in college (McCarthy and Kuh 2006). For example, almost half (47 percent) study only three or fewer hours per week, well below the thirteen- to fourteen-hour-per-week average of first-year students at four-year colleges and universities. Of two-year college students with fewer than thirty credit hours completed (the rough equivalent of being classified as a first-year college student), 25 percent spend eleven hours or more preparing for class each week (CCSSE 2004).

Even so, two-thirds of high school students who study three or fewer hours per week reported receiving mostly A and B grades. Less than one-fifth (18 percent) of students in the college-prep track took a math course after their junior year of high school. Only seven of ten high school seniors wrote as many as three papers of five or more pages. Only about half (53 percent) put a great deal of effort into their school work; about the same number (51 percent) said they were challenged to do their best work at school. Sadly, high school seniors are less likely to be academically challenged than their younger peers. No wonder less than half (47 percent) of high school students said their schoolwork makes them curious to learn about other things and only a third (35 percent) said they were excited about their classes.

Taken together, HSSSE findings suggest that many high school seniors are not prepared academically for college-level work and have not developed the habits of the mind and heart that will stand them in good stead to successfully grapple with more challenging intellectual tasks. The senior year in particular seems to be a wasteland: the overall engagement of high school seniors is much lower than that of any previous year. In fact, student engagement declines in a linear fashion between the first and the last year of high school.

What Students Expect and Do During the First College Year

The Beginning College Survey of Student Engagement (BCSSE) is a companion survey to NSSE and asks entering first-year students about their academic and extracurricular involvements in high school as well as the importance that these students place on participating in educationally purposeful activities in the first year of college. Taken together, the results from these instruments provide a portrait of who students are and what they expect to do in college as well as what they subsequently experience, information that can be used to design precollege orientation and socialization experiences with an eye toward enhancing student engagement and learning (Kuh 2005; Kuh et al. 2006; Kuh, Gonyea, and Williams 2005).

Institutional Examples

At **Winston-Salem State University,** new students and transfer students with fewer than thirty credit hours must enroll in one of three new-student adjustment courses. Sections designated for students interested in specific majors are taught by faculty members who serve as students' academic advisers and "mentors" for the entire first year. Student services professionals teach sections for undecided students.

In the freshman-year experience seminar at **California State University Monterey Bay**, new students design an individualized learning plan (ILP) that will guide their studies throughout the baccalaureate experience. At various points, such as the required junior-year major-specific proseminar, they update the ILP to respond to their changing educational and vocational goals.

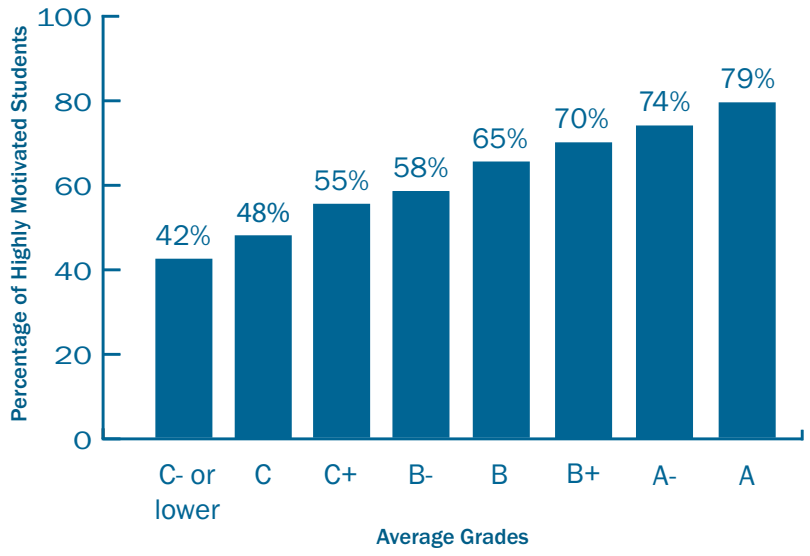
University 1301 at the **University of Texas El Paso** is a course on the transition to college taught by an instructional team of a faculty member, peer leader, and librarian. Classes feature active learning including "open forums" and group projects. Instructors and peer leaders meet with each student twice during the fall semester to review the student's academic progress.

BCSSE and NSSE data show that first-year students expect to do more during the first year of college than they actually do (NSSE 2005). For example, about three-fifths expected to spend more than fifteen hours a week studying, but only two-fifths did so. Put another way, they study two to six hours *less* per week on average than they thought they would when starting college. Even so, nine of ten first-year students expected to earn grades of B or better while spending only about half the amount of time preparing for class that faculty say is needed to do well. Three of ten first-year students reported working just hard enough to get by. Motivation matters, as more than 75 percent of "A" students say they are highly motivated to succeed, compared with only half of the "C" students (see fig. 1).

The gap between expectations and behavior extends to life outside the classroom as well. The vast majority of entering students expected to participate in cocurricular activities, yet almost one third (32 percent) spent no time in these activities during their first year. Between 40 percent and 50 percent of first-year students *never* used career planning, financial advising, or academic tutoring services. There are some areas where students do pretty much what they thought they would. One area is relaxing and socializing, which one quarter of students thought they would spend more than fifteen hours doing per week and 27 percent actually spend that much time doing. More than half predicted they would have little contact with their instructors outside the classroom; sadly, this became the case.

Institutions disappoint in other areas as well. More than four of every five students expected their institution to emphasize academics to a substantial degree and expected to attend campus events and interact with students from different backgrounds. But by the end of their first year, most students said that their institutions did not emphasize these areas as much as they expected. Nearly a third of students (32 percent) expected their school would emphasize interactions with peers from diverse backgrounds, but said that this was not the case. About three of every four students thought their school would provide substantial support to help them cope with non-academic responsibilities and enrich their social life, but more than half said that their school did not do so to the degree they expected.

Figure 1. Percentage of students who are highly motivated—by average grades



Putting Students on Pathways to Success

The structure of the curriculum and the arrangement of resources can increase the odds that students engage in productive activities. Providing students frequent feedback in the first weeks and months about the quality of their work will also help them succeed in college. For example, results from experimental items added to the Web version of NSSE in 2005 show that students who participated in a first-year course specifically designed to enhance their academic skills or social development enjoyed significant advantages over peers who did not have such an experience. Specifically, they

- were more challenged academically;
- reported more active and collaborative learning activities;
- interacted more frequently with faculty;
- perceived the campus environment as being more supportive;
- gained more from their first year of college;

- were more satisfied overall with the college experience.

Only about one-quarter of first-year students frequently ("very often" or "often") attended an art exhibit, gallery, play, dance, or other theater performance. But about the same number *never* attended such an event during the current school year. Here again, what students perceive that an institution values and emphasizes makes a difference. For both first-year students and seniors, the frequency with which they went to fine or performing arts events was positively related to the emphasis students perceived the institution placed on attending campus events and activities.

Showing newcomers what they must do to succeed in college is necessary but not sufficient. Also important is an infrastructure of support, including early warning systems, redundant safety nets, reward systems, and ongoing assessment. The high-performing institutions described in *Student Success in College* (Kuh et al. 2005) purposefully align their resources and structures with their educational missions, curricular offerings, and student abilities and aspirations, continually tweaking or introducing new programs and services to meet changing student needs.

Institutional Examples

Miami University's "Choice Matters" initiative encourages students to be more intentional about how they spend their time and to reflect on what they are learning from their experiences, inside and outside the classroom.

George Mason University monitors students' performance to ensure they do not slip through the cracks. In the midterm progress report, faculty members (who receive reports for their advisees) and the academic advising office contact students with low grades.

Fayetteville State's Early Alert System depends on an intricate network of faculty and mentors working in the first-year seminar course along with academic support units and University College and career center staff to identify and assist students in academic difficulty. All faculty teaching first-year students have contact information for students' mentors and the University College advisers so they can alert them if students seem to be struggling.

Pointing Students to Potentially High-Impact Practices

The Association of American Colleges and Universities' Liberal Education and America's Promise (LEAP) campaign champions more consistent, widespread use of effective educational practices, featuring some potentially "high-impact practices" that make a claim on student time and energy in ways that channel student effort toward productive activities and deeper learning. One of these is the learning community, which NSSE defines as "some formal program where groups of students take two or more classes together." Our studies show that students with a learning community experience were substantially more engaged across the board in other educationally effective activities compared with their counterparts who had not participated in such a program (Zhao and Kuh 2004). They interacted more with faculty and diverse peers, they studied more, and they engaged more frequently in higher-order mental activities such as synthesizing material and analyzing problems. They also reported gaining more from their college experience. Moreover, the differences favoring learning community students *persisted through the senior year,* suggesting that this experience—which most students have in their first college year—continued to positively affect students throughout their college years.

Participating in high-impact activities such as learning communities early in college can launch students on a trajectory of achievement that benefits them both in college and beyond. Providing students with regular feedback about their performance throughout their studies and providing opportunities to test what they are learning through problem solving with peers inside and outside the classroom, study abroad, internships, and capstone experiences help students develop habits of the mind and heart that promise to stand them in good stead for a lifetime of continuous learning. *Student Success in College* provides many examples of these and other effective educational practices.

Conclusion

First-year students typically study less, write less, and read less than they thought they would. Both students and institutions must share the responsibility for redressing this deplorable state of affairs. Our studies

show that when institutions emphasize certain activities, students are more likely to engage in them. For example, when faculty members emphasize educational practices such as writing, active and collaborative learning, or using diverse perspectives to understand issues, students are more likely to engage in these activities (Kuh, Nelson, and Umbach 2004). By identifying the gaps between entering students' expectations and their level of engagement in the first year of college, institutions can target their efforts to create educationally effective programs for new students (Miller et al. 2005; Upcraft et al. 2004). ■

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Accelerated Learning for What?

By Terrel Rhodes, vice president for quality, curriculum, and assessment, Association of American Colleges and Universities

In every state legislature and every state department of education, and on many two- and four-year college campuses, you will hear conversations about accelerated learning for high school students. The particulars will vary from place to place and time to time and will take different forms, e.g., middle and early college, tech prep, dual enrollment, college access programs, Advanced Placement (AP), and International Baccalaureate (IB) programs. The mantra is to provide high school students with the opportunities to advance their education more rapidly by completing parts of a college-level curriculum while still in high school.

At a national level, student performance on a variety of tests indicates that students in the U.S. are falling behind students in other countries on performance measures of proficiency in math, science, geography, basic literacy, etc. At state and local levels, concerns arise around not only performance, but also budgets and economics. These primary rationales for the increased emphasis on accelerating student educational progress seem to fall into three broad categories: (1) students will be better prepared for college (i.e., students will be college-ready and thus require less remediation); (2) less time will have to be spent in college, thus reducing costs; and (3) students, and thus the region, state, and country, will be more competitive in a global economy and world. The article by Jennifer Brown Lerner and Betsy Brand catalogs these same factors and reports on the mixed findings of an examination of programs across the country (see p. 27).

What Does It Mean To Be College-Ready?

There is a lack of consensus on what "college-ready" means. Often the meaning relates to creating environments in which students do not have to take remedial courses when they arrive at college. But is avoidance of the need to take remedial courses the same as having the knowledge and skills that college faculty believe are necessary to be successful? Does readiness include the higher-order "habits of the mind" or simply refer to content knowledge? Given that the 4,200 postsecondary institutions in the U.S. have very different missions and broad variation in their purposes and students, "college-ready" takes on many meanings that complicate strategies for formulating policy on a national or even statewide basis. Indeed, Lerner and Brand found significant data limitations when seeking program evaluations of the impact of accelerated high school options. In addition, most measures of impact do not focus on the student learning necessary for college success beyond grades and content knowledge in specific areas.

The most prevalent approach to preparing students for college has focused on enhancing the curriculum. The claim is that by providing students with a rigorous and challenging curriculum, performance on tests will be enhanced and the competitiveness of the country will be strengthened. Hence, we have the American Diploma Project Network and the National Governors Association Honor States program, which seeks to "help more young people graduate from high school prepared for college and work success" (NGA 2005, 1).

Typically, states that have adopted either of these programs have acted to increase the number of hours in English, math, and science courses. Although there is an acknowledgment that all students need certain knowledge and skills, the emphasis tends to be on content coverage

rather than higher-order abilities for liberal learning (e.g., critical thinking, collaborative learning, or analytic reasoning). Even a recent front-page *Time* magazine article, "How to Bring Our Schools Out of the 20th Century" (Wallace and Steptoe 2006), argued that twenty-first-century students need to be able to know more than one world, think outside the box, become smarter about new sources of information, and develop good "people skills"—in essence, they need a liberal education.

At the same time, schools are confronting the No Child Left Behind accountability requirements that all students achieve proficiency by 2014 in core subjects through work based on the standards from the National Assessment of Educational Progress. But as Rothstein, Jacobsen, and Wilder (2006, 1) observe, "no goal can be both challenging to and achievable by all students across the achievement distribution. Standards can either be minimal and present little challenge to typical students, or challenging and unattainable by below-average students. No standard can simultaneously do both." In addition, as David Koretz at Harvard points out, typical variation in performance between those with lower and higher achievement is not primarily racial or ethnic. Performance gaps in Japan and Korea, where students score well above U.S. students in math and science, exhibit the same range in scores (Rothstein, Jacobsen, and Wilder 2006, 1).

Recognizing the limitations in making comparisons of performance on different exams, but also recognizing the gross similarities in knowledge and skills being asked, Rothstein, Jacobsen, and Wilder (2006, 2) further draw attention to the need for clearly delineating what is meant by proficient and college-ready:

> The highest-performing countries can't come close to meeting the No Child Left Behind Act's standard of proficiency for all. . . .
>
> On a 1991 international math exam, Taiwan scored the highest. But if Taiwanese students had taken the NAEP math exam, 60 percent would have scored below proficient, and 22 percent below basic. On the 2003 Trends in International Mathematics and Science Study (TIMSS), 25 percent of students in top-scoring Singapore were below NAEP proficiency in math, and 49 percent were below proficiency in science. On a 2001 international reading test, Sweden was tops, but two-thirds of Swedish students were not proficient in reading, as NAEP defines it.

The emphasis across the country currently is to enhance the curriculum and its rigor as the most direct, and perhaps simplest, way to begin to close the performance gap between U.S. students and students in other countries around the world. Most often this translates into requiring more credit hours or courses in specified subject areas with performance change to be judged by some type of external standardized test from state, national, or international agencies.

The Preferred Choices

In the United States, two programs in secondary school—Advanced Placement (AP) and the International Baccalaureate (IB)—have been used increasingly during the last ten years, becoming the most pervasive options for students in high school who wish to take college-level courses and have the chance to earn college credit. The courses have an off-the-shelf curriculum that forms the basis of tests taken upon completion of the courses, which are graded and awarded a score representing the level of student performance—both advertise that students are "college-ready" as a result of their AP/IB work. The common curriculum and externally validated assessment of student performance provide appealing arguments for the rigor and value of these programs.

Advanced Placement Program

According to the nonprofit College Board that administers the AP program, AP provides thirty-seven courses and exams across twenty-two subject areas. Each exam is graded on a scale of 1 to 5. The AP Web page lists a number of "reasons to sign up" for the AP program:

Gain the edge in college preparation

- Get a head start on college-level work.
- Improve your writing skills and sharpen your problem-solving techniques.
- Develop the study habits necessary for tackling rigorous course work.

Stand out in the college admissions process

- Demonstrate your maturity and readiness for college.
- Show your willingness to push yourself to the limit.
- Emphasize your commitment to academic excellence.

Broaden your intellectual horizons

- Explore the world from a variety of perspectives, most importantly your own.

- Study subjects in greater depth and detail.
- Assume the responsibility of reasoning, analyzing, and understanding for yourself.

What college-bound student or family would not be motivated by all of these benefits?

Further, since individuals do not have to take courses in order to sit for the exams, students can repeat exams (although test dates are infrequent). And since the exams are multiple-choice, it is to students' advantage to guess if they can narrow their choices. Each test requires a fee. Both the national AP and many states offer fee reductions to students who can demonstrate need.

The International Baccalaureate Diploma Programme

IB is more popular abroad than in the U.S. and is not nearly as pervasive as AP, but it is available in many American school districts. The diploma program curriculum requires students to complete six courses from six different subject areas, write an Extended Essay (EE) of up to four thousand words, take part in the Theory of Knowledge (TOK) class, and fulfill a requirement of fifty hours in each of the Creative, Active, and Service (CAS) pursuits. Grades are awarded from one to seven in each subject, and up to three "bonus" points may be awarded depending on the grade results of the EE and TOK. Thus, a total of forty-five points may be obtained by the candidate for the final diploma. In order to receive an IB diploma one must earn a minimum of twenty-four points. Since the curriculum is offered in countries around the world, U.S. students can be compared in an international context.

Pros and Cons of AP/IB

The arguments that underlie the popularity and appeal of AP/IB include the rigorous or challenging content and the external scoring of the tests based upon national (AP) and international (IB) standards, which allows for comparability regardless of where the test was administered. The tests also include some skill/ability demonstration beyond knowledge of a content area, e.g., analytic reasoning.

Critics of the IB examination point to the cost of the tests that, if not subsidized in some way, advantage those with higher incomes. Even though the IB has a standard curriculum worldwide, the actual courses available in specific schools can vary substantially. There has also been criticism related to the segregation that often occurs between IB and non-IB students within a school. Since actual responsibility for IB rests with the local schools, there can also be broad variation in implementation, especially in the number of hours associated with the CAS activities. In general, the complaint raised is about the extraordinary time commitment required for IB program participants.

Critics of the AP program, including many AP teachers, argue that content coverage trumps time spent on developing other valuable outcomes (e.g., improved writing skills). Or equally important, the types of supports that have been associated with academic success for first-generation and underrepresented students (e.g., learning strategies, tutoring) are not available for such students in AP courses. Rigor in the various AP programs varies.

Given the popularity of the two exams, there is surprisingly little data on the impact of either AP or IB on future learning and success. At a summit sponsored by the Lumina and the Bill and Melinda Gates Foundations in Atlanta in 2006, the report of the proceedings concluded that evidence of a positive impact from accelerated learning options is weak at best. Lerner and Brand (2006) of the American Youth Policy Forum underscored and illustrated this point, citing conclusions from a two-year research project that evaluated twenty-two postsecondary transition initiatives. "While the project was able to identify some signs of positive performance, it also concluded that the initiatives collected insufficient data for a thorough analysis of outcomes (due to lack of longitudinal data and an inability to disaggregate)" (Reindl 2006, 3).

ACT, Inc., producer of one of two major college-admissions tests, defines college readiness as having a 75 percent chance of earning a C or better, and a 50 percent chance of earning a B or better, in four common first-year courses. A 2004 study of the relationship between high school course taking, ACT scores, and students' college grades found that "only 13 percent of students who had competed high school math through algebra 2, and only 37 percent who had completed math through trigonometry, achieved the score that the ACT identified as ready for college-level work" (Olson 2006, 2). A study of Chicago public school students found that grades in core academic courses were more important predictors of college enrollment and graduation than scores on admissions exams. Trevor Packer, executive director of

the College Board, has indicated that research suggests the AP label may be given to high school courses that do not actually use college-level curricula (Viadero 2006).

> Klopfenstein and Thomas (2006) found no evidence that the average student derives a positive benefit from AP experience beyond that provided by a non-AP curriculum strong in math and science. Studies finding positive AP effects do so because they fail to control for the student's non-AP curriculum. . . . Using students who entered Texas public universities directly after graduating from high school in May 1999, we find that, for the average student, regardless of race or income, AP experience does not increase the likelihood of early college success beyond that predicted by the non-AP curriculum. . . . We demonstrate that studies which find positive effects of AP enrollment on college outcomes are unreliable when they fail to control for the body of the student's non-AP curricular experience.
>
> Sadler and Tai found that while students who had taken AP courses in those subjects [physics, chemistry, and biology] in high school received better college science grades than peers who had not, the differences were minimal . . . the AP advantage shrank by half when controlled for differences among students in prior achievement, other high school coursework, and parents' income and educational levels. (Quoted in Viadero 2006, 1)

As these and other studies are finding, much of the AP effect disappears when other core courses are added. Rigorous curriculum becomes the key. However, most recently, and not yet released at this writing, two new studies reported in the *Washington Post* and *Inside Higher Education* that were commissioned by the College Board using data on Texas students find that AP courses and exams do have a positive impact on students on a variety of standard measures of college performance. The superintendent of the Redmond, Washington, schools argues that all courses should be AP courses, i.e., they should involve rigorous coursework in academic core areas that could allow for more curriculum-wide attention to liberal learning goals and to the pedagogical approaches that have been demonstrated to enhance student success for all students, including first-generation and underrepresented students—a point that Lerner and Brand also raise in their article. As the Atlanta summit participant practitioners pointed out, "acceleration is not just going faster but structuring the learning experience and teaching in a more effective way. Acceleration motivates students by challenging them rather than remediating them" (Reindl 2006, 2).

Conclusion

AP/IB are likely to continue as leading options for students to gain college credit while still in high school, as demanding courses that typically exceed standard high school courses, and as college admissions markers for many campuses that give AP/IB students a boost when considered for admissions. The evidence that AP/IB programs correlate with college success remains limited and conflicted, especially related to essential liberal learning outcomes. The evidence that AP/IB programs correlate with college success remains limited. Just as some colleges are eliminating SAT and ACT exams as part of admissions, a handful of high schools (typically very selective ones) have either never adopted AP/IB or have dropped them in favor of rigor in their standard curriculum (Hammond 2005).

However, few high schools are willing to incur the ire of parents and students who view AP/IB as essential for college entry and to ignore the fact that the programs can enhance learning, especially when the standard curriculum is not providing challenging learning experiences for all students. The real challenge is designing accountability and stimulating challenge for all with realistic goals that reflect human variation. ■

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The Power of Course Design to Increase Student Engagement and Learning

By L. Dee Fink, former director of the Instructional Development Program, University of Oklahoma

All professors would like for their students to be prepared when they come to class, to be motivated to learn, and to achieve high-quality learning that prepares them not only for future classes but also for future personal, social, and professional life experiences. But it often doesn't happen that way. What many professors are finding is that students become more motivated and engaged when courses are designed and integrated with significant learning goals. In this article, I will describe the meaning of "significant learning," identify the principles of effective course design, and then offer two examples of what happens when people use these ideas.

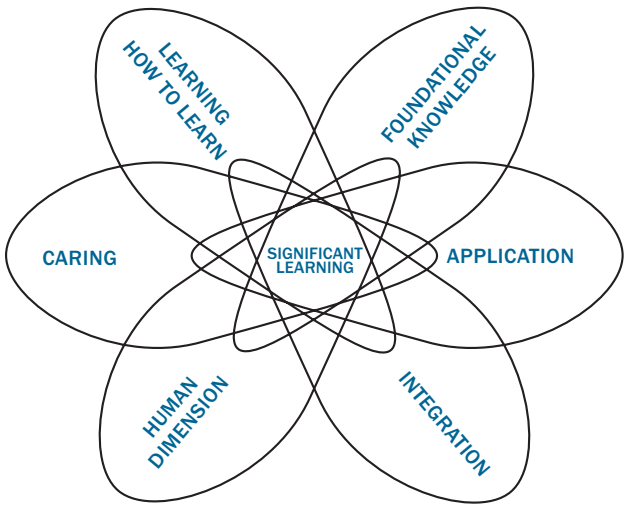
Significant Learning

If we want students to have a "significant learning experience," we must begin by figuring out what we might mean by significant learning. In my book (2003), I offer a taxonomy of significant learning. This builds upon but goes beyond the well-known taxonomy that was created by Benjamin Bloom and his associates five decades ago (1956). Like Bloom's taxonomy, this taxonomy has six general categories of learning, but—unlike Bloom's—they are interactive rather than hierarchical (see fig. 1).

Briefly, these six kinds of learning can be described in the following way:

1. Foundational knowledge: This is the set of facts, principles, relationships, etc. that constitute the content of a course. This we want students to "understand and remember."
2. Application: Most disciplines require students to do something with the foundational knowledge. This might involve some physical skills (e.g., operating technical equipment); more commonly it involves engaging in some kind of problem solving, decision making, or creative thinking.
3. Integration: It is often helpful for students to be able to identify the similarities or interactions between one subject matter and another, or between different theories, historical trends, etc. This is the whole thrust of interdisciplinary learning.
4. Human dimension: When students report that they have learned something in a course about themselves or about how to interact with others in life, this is truly significant.

Figure 1. The taxonomy of significant learning



5. Caring: This is what happens when students change their feelings, interests, or values in relation to a subject.
6. Learning how to learn: Given the fact that we never teach students everything they will ever need to know about a subject, we need to help them learn how to keep on learning about it after the course is over.

The premise is that any course can address all six of these general kinds of learning. And the more of all six the course can promote, the more significant will be the overall learning experience for the student.

How can we do this? By learning how to design our courses in a much more powerful way. We have to learn how to design significant learning into our courses, and this is the purpose of integrated course design (ICD).

Integrated Course Design

The basic idea behind ICD is that, rather than simply develop a list of topics in a course and then provide students with lots of information about each topic, we need to design our courses in a way that is learning-centered, systematic, and integrated. If we can do this, students will respond by becoming more engaged in the work of learning and will succeed in achieving more important kinds of learning.

How does this process work? The key steps are illustrated in figure 2.

Situational Factors

Every time we teach, the situation is a little different. Therefore we need to begin by gathering information about a number of factors:

- Specific context: How many students are in the course? What is the level of the course and the time structure? Will it be offered live, online, or in a hybrid context?
- Expectations of others: Is this course expected to meet certain department goals, university goals, professional licensing requirements, etc.?
- Nature of the subject: The sciences are often "convergent" (working toward a single correct answer), while the humanities are often "divergent" (intentionally seeking multiple interpretations of a piece of work). How do these and other differences in the nature of the subject need to be taken into account?
- Nature of the students: What feelings do they have about this subject? What prior knowledge or experiences related to this subject do they bring with them?
- Nature of the teacher: What beliefs and values do we bring to the course? How do these compare with those of students?

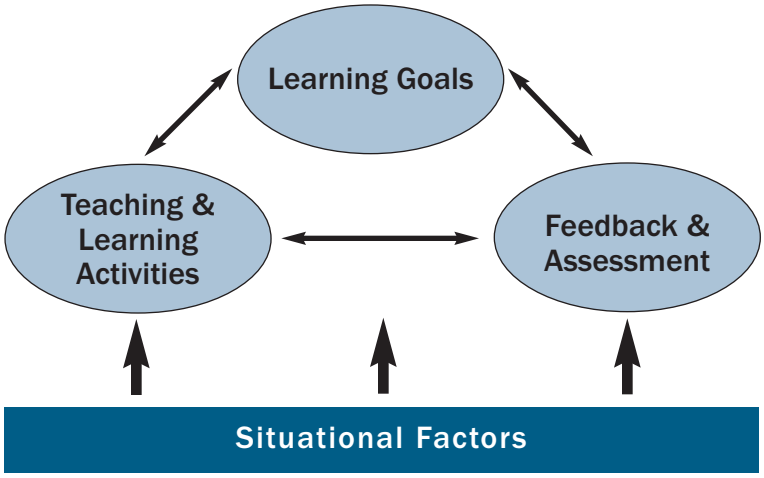
This information is then used (as indicated by the arrows in fig. 2) in making the major decisions about how the course is going to operate.

Learning Goals: What Do We Want Students to Learn?

The first decision in a learning-centered course is about what we want students to learn. As we consider this, we need to go beyond wanting them learn everything about the major topics; we need to formulate more exciting and challenging learning goals. This is where the taxonomy of significant learning can be helpful. It provides us with six kinds of learning to consider for any course.

When formulating our learning goals, it can be helpful to frame this process around a sentence-completion

Figure 2. Model of integrated course design



exercise. The exercise begins with the phrase: "By the end of this course, my hope is that students will. . . ." We then complete that sentence with our learning goals.

The following list shows how we could use the taxonomy of significant learning to formulate a generic set of learning goals. My hope is that, by the end of this course, students will . . .

1. *understand and remember* the key concepts, terms, relationships, etc.;
2. know how to *use* the content;
3. be able to *relate* this subject to other subjects;
4. identify the *personal and social implications* of knowing about this subject;
5. value *this* subject—as well as value further learning about the subject;
6. know how to *keep on learning* about this subject—after the course is over.

Learning Activities: How Will They Learn That?

Once we have formulated important learning goals, we need to identify learning activities that will in fact enable students to achieve those goals. This requires using the principles of active learning (Bonwell and Eison 1991), one of the more important concepts to appear in the literature of college teaching in the last fifteen years. If we want students to achieve more powerful kinds of learning, we need more powerful learning activities.

I adapted the central tenets of active learning into what I call a "Model of Holistic Active Learning." This model proposes that students need some way of

- acquiring the necessary *information and ideas*—this is usually accomplished by out-of-class readings or in-class lectures;
- having an observing or doing *experience*—case studies, problem-solving and decision-making exercises, role playing, hearing stories of others' experiences, etc;
- *reflecting* on the meaning of the information or experience through one-minute papers, weekly journals, or learning portfolios.

It is important that the teacher find some way of including all three kinds of learning activities not only in each course, but also in each of the major units within the course.

Feedback *and* Assessment: How Will We Know If Students Have Achieved the Intended Learning Goals?

A good concept for guiding our efforts on this task is "educative assessment" (Wiggins 1998). This concept proposes that good assessment is assessment that does more than provide a basis for assigning a grade; it educates as well. To do this, our assessment activities need to include several key elements:

- Authentic tasks: A part of assessment requires knowing whether students have a basic understanding and retention of the content. But our assessment needs to focus on whether they can do something with that content.
- Clear criteria and standards: When we assess complex learning, we need to develop clear criteria (the "yardsticks") and clear standards (the levels of achievement on the yardsticks).
- Opportunities for self-assessment: After college is over, students will have to assess their own performance in most situations. We can help them do this well by giving them practice with and feedback on assessing their own work.
- "FIDeLity" feedback: Students need feedback on their work that is **F**requent, **I**mmediate, **D**iscriminating, and delivered "**L**ovingly," i.e., in a user-friendly way.

Integration: Do All the Parts of Your Course Reflect and Support Each Other?

After you have developed significant learning goals, learning activities that reflect the principles of active learning, and educative assessment opportunities, the next step is to make sure all three of these components are integrated, i.e., that they reflect and support each other. There are two tools for accomplishing this.

The first is to use a three-column table to construct the specific components. You want to begin by listing all the major learning goals in the left-hand column. Then, for each learning goal, fill in the rest of the row. Identify the learning activities needed for students to achieve that goal and then the assessment activities appropriate for that kind of learning. What quickly becomes apparent is that, for each kind of learning, you need different learning activities and different assessment activities. An example, just using three learning goals, is shown in table 1.

A second tool for integration is to give serious thought to the teaching strategy you want to use. A teaching strategy is a set of specific learning activities arranged in a particular sequence.

Table 1. Three-column table: An example

Learning Goals	Teaching and Learning Activities	Feedback and Assessment
1. How to solve problems	Practice solving problems, with feedback	Solve new, complex problems
2. How to work with others in a team	Work with others—with periodic feedback	Assessment by peers
3. How to plan for future learning	Identify future learning needs, develop a learning strategy	Assess the learning plan

A good strategy has different activities that serve different purposes within the overall learning process, e.g., providing information and ideas, doing or observing, and reflecting. It is also important that each learning activity builds on what has happened previously and prepares students for what comes next.

Does It Work?

When teachers design their courses this way, does it make a difference in terms of student engagement and learning? The answer is clearly yes. Although these ideas have only been available a few years, professors who have learned about them and tried them are reporting major differences compared to what they were doing before. I will share two of these stories here, one from social science and the other from engineering.

Carolyn Fellahi, a psychology professor at Central Connecticut State University, recently tested the ICD model by comparing two sections of a course on lifespan development, both taught by herself (2006). One section was taught using the lecture-driven method that she had been using for many years; the other was redesigned using integrated course design.

She assessed the students in each section with pre- and post-tests that focused on each of the six kinds of significant learning. The results are shown in table 2.

Scores of student learning in the redesigned course were higher on five of the six kinds of learning, and higher at a level of statistical significance in four of the six. While the scores for "learning how to learn" and "caring" were not where the model would predict, the author noted that "one possible explanation involves the limitations of the test that was developed" to measure these two types of learning.

The second story involves Bill Weeks, a professor of computer engineering at the University of Missouri–Rolla who used the ICD model to redesign a course on coding theory (2003). Weeks had been using the traditional teaching strategy of lectures and homework in this math-intensive course, but students felt overwhelmed by the material, frustrated, and apathetic, and they gave the course low evaluations.

After attending a workshop on ICD, he wrote new learning goals, applied the principles of active learning and educative assessment, and used team-based learning—a teaching strategy that uses small groups in a distinct and powerful way.

In the redesigned version of the course, students did just as well in learn-

Table 2. Differences in pre-test and post-test scores for original course (fall 2004) versus redesigned course (fall 2005).*

Taxon	Original course (mean difference ± S.D.)	Redesigned course (mean difference ± S.D.)	P Value
Foundational knowledge	5.15 ± 4.08	10.23 ± 3.02	<0.001
Application	1.54 ± 0.93	2.39 ± 0.74	<0.001
Integration	1.54 ± 0.87	2.43 ± 1.17	<0.001
Learning how to learn	5.92 ± 2.20	7.06 ± 1.56	0.665
Human dimension	1.67 ± 3.59	11.84 ± 5.07	<0.001
Caring	2.93 ± 0.59	2.08 ± 0.54	0.9333

* Data analyzed using independent samples t-test.

ing foundational knowledge (as evidenced by their performance on the same exams), even though he spent less class time focused specifically on that kind of learning. And they did much better on the new learning goals, which he had not even been attempting to promote before. But the major change reported by the professor was in student morale in the class:

> The student response was nothing less than phenomenal. I never could have anticipated such drastic improvements in student morale. I was especially surprised that the students were motivated to work so hard. Many students reported to me that they enjoyed the workload in the class.

And seeing that change—students working harder and enjoying it more—had a predictable effect on the professor: "Teaching such an excited group of students was an unforgettable experience. It made my job seem worthwhile and very fulfilling. I will be feeding off that student excitement for years."

Conclusions

Professors in higher education are finding that, when they use the model of integrated course design to restructure the learning experience, students respond by becoming more engaged in the learning process and by achieving more significant kinds of learning. This happens because students become co-creators of their own learning, the intended learning has greater meaning, and students are given a wider range of tools to create this learning—often including the opportunity to work closely with other students on promoting each other's learning. ■

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AAC&U CALENDAR

In addition to its annual meeting, AAC&U offers a series of working conferences and institutes each year. Additional information about the upcoming meetings listed below is available online at www.aacu.org/meetings.

Network for Academic Renewal Meetings

March 1–3, 2007
General Education and Assessment
Miami, Florida

April 19–21, 2007
The Student as Scholar: Undergraduate Research and Creative Practice
Long Beach, California

Summer Institutes

May 18–23, 2007
Institute on General Education
Newport, Rhode Island

June 20–24, 2007
The Greater Expectations Institute
Burlington, Vermont

Motivating Today's College Students

By Ian Crone, assistant dean of students and director of the Frick Center, and **Kathy MacKay**, dean of students, both of Elmhurst College

With an early December wind chill topping out at eleven degrees and the setting sun quickly fading behind the carillon of our campus chapel, it may seem like a strange time to contemplate student motivation on our small Midwestern campus of Elmhurst College. Yet, as we observe the initiative, dedication, and persistence of the eight undergraduate students who have spent the past three hours lining our campus walkways with one thousand luminaries, we wonder why these students are so dedicated and others are not. At a time in the academic year when most students' motivation for learning and involvement has shifted from inquisitive exploration to exhausted survival, the members of the Walk for Hope steering committee are inspired by and dedicated to their task of placing the paper bag luminaries, each sponsored by a community member to raise money for the American Cancer Society. Are these students motivated to raise money for a good cause or to surpass the amount last year's steering committee raised? Perhaps it's the opportunity to do something with their immediate group of friends or do something to invoke the pride of their family? Little separates these students from today's average undergraduate. Yet, at this moment they exhibit what seems an increasingly scarce resource desperately sought by faculty and student affairs administrators nationwide, a trait that fuels academic success, engagement, and learning: student motivation.

Conversations with faculty and staff colleagues at small private and large public institutions over the last several years have echoed themes of frustration concerning the need to compete for students' time and attention. Students appear to spend hours surfing Web sites, hanging out in groups, and updating their Facebook sites. They compete for multiple leadership positions from which they often fail to gain all they could because few focus fully on their responsibilities. They forfeit deeper engagement in academic research to earn minimum wage at a retail store in a nearby mall.

Identifying Student Needs

Whether you believe the characteristics commonly attributed to the Millennial Generation or not, it is clear that the manner in which students are motivated to engage in higher education has been changing and will continue to change rapidly. The priority students affix to their education is too often usurped by increasingly demanding and time-intensive life priorities such as work, family, or emotional/psychological needs. Many members of this generation of students continue to live in an age of convenience and consumption. A college education has become commodified, understood as yet another acquisition to be made rather than a process in which you engage. Yet, as the Association of American Colleges and Universities describes in *Greater Expectations* (AAC&U 2002), students need to become intentional architects of their own learning, actively setting goals, exploring, reflecting, and integrating acquired knowledge and experiences into existing worldviews. In today's environment of convenience and consumption, how can students be persuaded to move beyond "commodity" thinking and fully engage both in and out of the classroom in activities that enhance their learning? How can they be inspired to become immersed in learning?

Elmhurst College is a small liberal arts college, but its student body defies easy classification. Each fall, the college attracts a first-year class of approximately five hundred, approximately three hundred transfer students, and a number of adult students. Over 50 percent of students live off campus and many work at least one job. Because very different reasons underlie students' decision to enroll at Elmhurst, inspiring student success and learning requires understanding motivation from a variety of perspectives. In fact, when we discuss student motivation, what we are really talking about is whether or not students have made educational activities a true priority: whether they have chosen to fully invest their time and energy in their college experience. Likewise, once students do demonstrate motivation, we are interested in understanding this commitment itself. How do they take initiative, apply effort, persist to overcome obstacles, and, ideally, reflect on their accomplishment once they have succeeded?

When we consider the motivation of undergraduates, it is important to consider characteristics commonly attributed to this generation of traditional-age students. Respecting the power of relationships is critical to student motivation. Today's students appear to be the recipients of a great deal of family involvement and attention, and it is not unusual for the expectation of this involvement to continue after they enroll in college. Many students continue to have regular, sometimes daily contact with their parents, calling to provide updates or seek consultation on even minor decisions. While partnering with students' families, particularly the notoriously labeled "helicopter parents," may invite a loss of student autonomy, we have found that strategic, carefully crafted invitations that enlist limited parental support serve us well. We have begun to provide a consistent message to families during the admissions, advising, and orientation process, linking student success to the appropriate use of time, and urging the family members to support student initiative and responsibility in the process of learning. Families are also frequently invited to help students overcome obstacles. We honor the Family Educational Rights and Privacy Act restriction on sharing specific student information, but we enlist family members' help by educating them about campus resources, such as our Learning Center and Counseling Center, and we encourage them to talk to their children about taking advantage of the services available. In both of these instances, we employ the student's relationship with his or her family to help make learning a priority.

Finally, we have, on more than one occasion, wondered if students transfer the expectation of involvement with their parents to the college. Are they expecting the same kind of support or parenting from faculty and staff? Frequent communication and an engaged academic adviser or student organization adviser are among the keys to maintaining student initiative and effort.

Motivating Millennial Generation Students

We have also become aware that students increasingly seek someone to provide structure, direction, and praise in a way previous generations of students did not. Today's students often ask what to do before thinking through their own plans. It seems they want things to be fixed or done so they can move on to the next project. We have found that the most successful advising style has been to ask questions

When we discuss student motivation, what we are really talking about is whether or not students have made educational activities a true priority: whether they have chosen to fully invest their time and energy in their college experience.

that lead students to formulate their own ideas. Whether in the classroom or in a leadership experience outside of class, this use of inquiry forces students to make the educational experience their own by requiring that they reflect on the challenge at hand and develop a solution of their own. The energy generated by these students' realization motivates them to take action where providing the answer would not.

At Elmhurst and across the country, today's undergraduates are very accustomed to group activity. We have seen a trend over the last few years toward copresidents or leadership teams. Students still compete to be the president of an organization or the editor of a publication, but it seems they do not want to be alone with their responsibility. Our students are generally very peer-network oriented, preferring to work and socialize in groups. Capitalizing on this preference for group activity to promote motivation is challenging, but not impossible.

One simple way to encourage greater motivation is to use a student's relationship with the group to focus his or her attention. For example, the student leaders in our Student Government Association (SGA) appear significantly affected by the evaluations of their peers. Each semester, staff advisers of SGA administer a standardized peer evaluation, asking group members to rate their leaders' commitment, knowledge, and performance. The results serve to provoke the leaders to apply effort to improve and stimulate reflection about what they are learning from their leadership experience. Ultimately, relational techniques that were successful in increasing initiative for students from previous generations must be even more personalized today.

Increasingly critical to student motivation is an informed perspective on the diversity of students. For example, many campuses traditionally have held overnight or weekend retreats as a way to get students away from the day-to-day activities to begin to develop as a team and focus on their group and responsibilities. However, for students who are not comfortable staying away from home overnight for reasons involving disabilities or cultural values, this may not be a viable option. Because of increasing student diversity, it is critical for staff and faculty to know their student population well enough to know what unique obstacles and incentives may inspire or discourage motivation.

Many students come to Elmhurst accustomed to a frantic schedule of academic, work, and cocurricular activities. Students often continue to maintain these busy schedules in college, sometimes from dawn until well after midnight, moving from class to student organization meetings to on- or off-campus work. While these students' frenzied schedules may create the impression that they are highly engaged in their college experience, in fact some students have created a rigid compartmentalization of many seemingly disconnected experiences. Rather than expend the time necessary to encounter new ideas, reflect, and make connections with their existing worldview, many of our students carefully budget the minimum amount of time necessary to allow them to achieve the grades they desire while fitting in as many other activities as they possibly can. As a result, students sometimes end up overwhelmed when something in their schedules shifts unexpectedly. But we can help students be more sensitive to how they use their time, and in turn, help them use their

time to immerse themselves more fully in the experience of learning. For example, by scheduling regular, brief one-on-one meetings with the student leaders, we are able to compel them to stop and reflect, refocus, and connect. In this sense, we hope that the disconnected parade of class, work, and cocurricular activities can begin to dissolve into a more seamless educational experience.

One generational characteristic we have observed in many students is a significant achievement orientation. However, while students may want good grades for graduate school admission, too often they may not want to focus on learning what they need to be successful in graduate school. They may have long list of honors, awards, and leadership positions in clubs without understanding that what they have learned in their positions (i.e., public speaking, critical thinking, or intercultural awareness) is what will make them successful. If they cannot articulate what they learned in the organizations listed on their resumes, they will not get the jobs or have the skills the employer is expecting. One technique we've found to be successful in provoking greater effort and reflection involves a tool often used in the classroom—persistent inquiry. By asking questions, we check students' assumptions and often provide them with helpful information about getting a job.

Engagement through Experiential Opportunities

In our work with students such as those from the Walk for Hope steering committee, we advance an educational, or developmental, agenda through the use of experiential opportunities and education. Much like service learning, experiential education allows for increased educational outcomes. Experiential learning is particularly useful for this generation, which exhibits a much higher sensitivity to issues related to social justice and a marked desire to do good. It is not unusual for us to be able to appeal to an individual student's philanthropic orientation to inspire initiative. When we are able to help students see that a project in which they are involved—such as planning a lecture on the impact of fair-trade coffee—is achieving a greater good, they are much more inclined to persist until the project is complete. We believe this is due in part to this generation's response to 9/11 and tragedy they have seen during their lifetime.

This generation of college students has been raised on interactive technology and entertainment-style communication. We have been told by our students that straight lectures or PowerPoint presentations rarely hold their attention. Experiences that involve students and require them to interact as a part of their own learning are more likely to maintain their interest.

Finally, one timeless aspect of out-of-class education that can provoke a great deal of initiative and encourage persistence is reality, and the realistic dangers of failure. It is critical to help students understand the realistic, albeit sometimes indirect, steps between the generally comfortable routine of college life and the upsetting reality of failure, whether it manifests itself in diminished prospects for employment, disappointed family members, or a failure to raise as much money for a philanthropy as the group the year before. By helping students see—perhaps for the first time in their lives—that the work in which they are engaged is meaningful work that is important for them to accomplish, we can help students take the initiative, avoid failure, and learn.

In 1954, when Abraham Maslow attempted to organize human motivation in the hierarchy of needs, Facebook was not an obstacle to self-actualization. But just as the society challenges educators to think of innovative ways to inspire students to take initiative and persist to success despite their daily distractions, so too does it provide new avenues to promote learning. While placing one thousand luminaries on a bone chilling night may, at first, appear daunting, the persistence of these students illustrates that student engagement is often the first step on the path to student motivation. ■

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Liberal Learning in the Age of Audiovisual Pollution

By Ivelin Sardamov, assistant professor of political science, American University in Bulgaria

I often ponder the challenges and opportunities I face teaching at the American University in Bulgaria (AUBG). AUBG was created in 1991 to bring American-style liberal arts education to a landscape dominated by vocational training. AUBG's student body of almost one thousand students is composed of two-thirds Bulgarians and one-third international students—primarily from Romania, Albania, the former Yugoslavia, and the former Soviet republics. Our students have robust academic potential, strong dedication in their work, and a firm belief in the value of a liberal education.

There are many aspects of a liberal education. To me, the most important of these is the notion that, in addition to acquiring valuable vocational skills, students should develop an understanding of the ethical implications of using such skills. The importance of this ethical sensitivity was once highlighted by Socrates, who accused the Sophists of emphasizing technique and neglecting the moral framework within which the skills they taught would be employed (Carr 1994). Developing such sensitivity is probably the most difficult part of liberal education. It requires a particular kind of motivation on the part of students that goes beyond the acquisition of particular skills and encompasses the development of how they think about general and abstract topics. This task has never been easy, and today it may be made even more difficult by some new challenges.

The first thing that strikes me as I talk to my current students is how much less general knowledge of social and political issues they seem to command. Although for the most part my students are bright and ambitious, they have asked me who the Russian Bolsheviks were, placed the Marshall Plan in the aftermath of World War I, and confused Pakistan with Palestine. Some of my colleagues relate such lapses in student knowledge to the disintegration of the state-run educational systems in many post-communist countries. I, however, believe that an incoherent high school curriculum is often the main culprit of this unfortunate trend.

I know from students that they covered a range of historical topics in high school, but they have no personal point of reference for these historical facts. Historical events and social issues tend to be elbowed out by more personally significant information (related to the latest pop charts, movies, brands, gadgets, video games, etc.). Therefore, most students end up thinking in largely concrete terms and fail to perceive patterns that should be obvious to them. Consequently, today's students often take new information at face value.

This last tendency is particularly striking. Too often students lack critical thinking skills. For example, last spring I asked students in my introduction to politics course to read a brief column about an infamous case of cannibalism that took place in Germany a few years ago. On the surface, the author was making the argument that according to liberal principles, there is nothing wrong with any act involving consenting adults. Surprisingly, after ten minutes of discussion in small groups, not one of my students was able to see clearly the irony and sarcasm behind the author's argument and to grasp his point that, after all, we need some absolute principles for society to function.

This general sense of confusion does not result from any intellectual or moral weakness on the part of students. Rather, the difficulties they encounter are probably associated with a challenge we all face—the trials of the information age. We are increasingly submerged under an influx of mostly trivial sights, sounds, and experiences that clamor for our attention. Amidst such audiovisual pollution, the lack of prior conceptual frameworks can sometimes allow for mental flexibility and lack of excessive bias; but it can also generate some of the disorientation described above.

This disorientation creates mounting problems for most students. They face numerous pressures trying to handle their academic workload, and many fall behind. This complicates their time management, and increases their stress levels. Students become trapped in a particularly vicious circle of sleep deprivation and resulting negative academic consequences. The two sides of this circle are, in fact, intimately connected. Findings in brain research suggest that conceptual thinking and academic time management (including impulse control) are related to the development of one key part of the brain cortex, the so-called frontal lobes. The maturation of the frontal lobes is a very intricate process which is not complete until one's early twenties, or even later in life. It can be impeded by the chronic stress and agitation foisted upon young brains by the information glut created by electronic communication, the multiple tasks imposed by demanding courses, and an overly crowded marketplace for things and ideas. Or rather, young brains may adapt to this intellectual environment by developing particular thinking styles involving high tolerance for incoherence and little appreciation for building orderly intellectual frameworks.

Students face problems perceiving the wider ethical implications of the knowledge and intellectual habits they acquire as well. They also lack sufficient motivation to develop aspects of their thinking they do not recognize they are missing, and to acquire knowledge of general issues to which they cannot personally relate. These are probably the greatest obstacles liberal education needs to overcome in order to live up to its promise of assisting the development of intentional learners capable of lifelong integrative learning. Though some of the limitations I describe (particularly ones concerning the appreciation of irony or humor) may be related to language proficiency, I also have a sense that they reflect wider cultural shifts. In fact, some of these problems seem to have a longer history in the United States (Healy 1991).

So how do we help students filter out audiovisual pollution and motivate them to take full advantage of their liberal education? Authors who try to integrate recent advances in brain science into pedagogy tend to emphasize the need to help students establish links between concrete, personally significant issues/experiences and general concepts—mostly through the use of numerous relevant examples (Zull 2002). This task can be made easier through the use of multiple visual aides, including brief video segments (ten to fifteen minutes) that can be related to more existentially distant scholarly or journalistic texts. Frequent evaluation and feedback (as detailed and precise as possible) are also crucial for reinforcing student motivation to keep up with readings and concepts. I have found the use of brief in-class writing exercises in which students have a few minutes to address a specific question related to some of the most basic ideas in their assigned readings particularly useful. Other teaching devices (asking students to participate in debates or simulations, to give brief presentations, or to summarize what they have learned) may also help students stay on track, and in the process develop valuable practical skills. I tend to be a bit apprehensive, though, about turning the schoolroom into a playroom as a way of introducing only material that is immediately relevant and interesting to students.

When I speak of the difficulties and limitations of most students, I never forget that there are exceptions. However, the majority of students do have difficulties making sense of the academic tasks they face and developing their critical thinking and ethical sensitivity. Assisting them requires a clear understanding of the complex challenges they are facing, and much sympathy from us, their teachers. We often seem preoccupied with transmitting a large body of information traditionally deemed essential within our disciplines, and fail to recognize that an overload of data and assignments can in fact impede the development of those higher-order thinking and empathic abilities we associate with liberal education. ■

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Data on Student Preparation, College

A few resources offer national data on student preparation and achievement. The National Assessment of Educational Progress (NAEP) provides data about the academic preparation and achievement of American elementary and secondary school students by subject. ACT tests, meanwhile, seek to predict how current high school students will perform in courses commonly taken by new college students. And the Educational Testing Service (ETS) offers standardized tests that measure key college learning outcomes like critical thinking and writing, although their findings often run counter to student self-assessments and campus assessments. Other sources of information, like faculty and student surveys, provide additional perspectives on achieving key learning goals.

The data gathered below highlight some of these challenges. More detailed findings are available in the reports from which these data are drawn.

High School Student Achievement

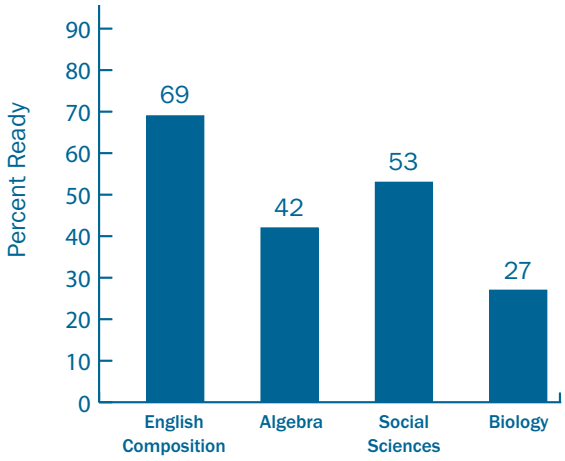
Achievement in Reading and Mathematics (NAEP)

- In 2004, 80 percent of seventeen-year-olds were able to "interrelate ideas and make generalizations in reading"; 38 percent demonstrated an ability to "understand complicated information" when reading.
- In 2004, 59 percent of seventeen-year-olds were able to perform "moderately complex procedures and use logical reasoning to solve problems"; 7 percent were able to apply "a range of reasoning skills to perform multistep problem solving and algebra."

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, *NAEP 2004: Trends in Academic Progress* (Washington, DC: U.S. Department of Education, 2005).

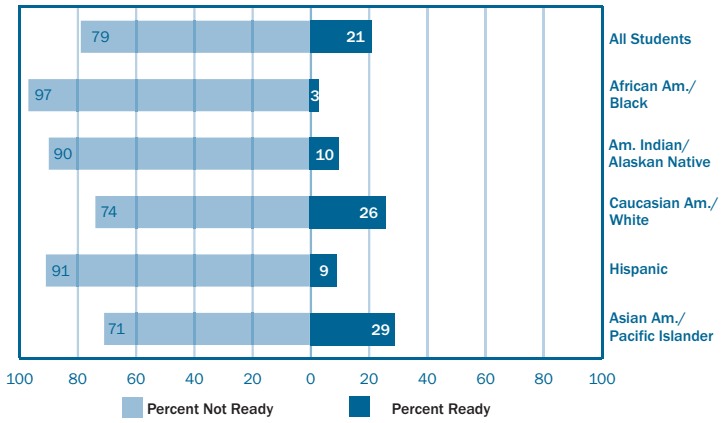
College Readiness

Percent of National ACT-Tested Graduates in 2006 Likely to Be Ready for College-Level Work, By Subject



Source: Reprinted by permission from ACT, Inc., *ACT College Readiness Report* (Iowa City, IA: ACT, Inc., 2006).

Percent of Students Meeting ACT College Readiness Benchmark Scores in All Four Subjects, by Race/Ethnicity



Source: Reprinted by permission from ACT, Inc., *ACT College Readiness Report (Iowa City, IA: ACT, Inc., 2006).*

What Do Faculty Say?

- Across all types of colleges and universities, only 36 percent of full-time faculty agree that students are well prepared academically.
- Working with underprepared students is a source of stress for 56 percent of faculty.
- Forty-one percent of faculty at all types of institutions say that most of their students lack the basic skills needed for college-level work.

Source: Lindholm, J. A., K. Szelényi, S. Hurtado, and W. S. Korn, *The American College Teacher: National Norms for the 2004–2005 HERI Faculty Survey* (Los Angeles: Higher Education Research Institute, University of California, Los Angeles, 2005).

Readiness, and Achievement in College

Achievement in Other Subjects (NAEP)

Subject	Achievement Level (Grade 12)			
	Below Basic	At or above Basic	At or above Proficient	Advanced
Science (2005)	46%	54%	18%	2%
Writing (2002)	26%	74%	24%	2%
U.S. History (2001)	57%	43%	11%	1%
Geography (2001)	29%	71%	25%	1%
Civics (1998)	35%	65%	26%	4%

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, *NAEP Data Explorer,* nces.ed.gov/nationsreportcard/nde.

How Engaged Are High School Students?

- Half of high school students say they devote four hours or less per week to class preparation.
- Fifty-three percent of high school students said they put forth a great deal of effort in their school work.
- Thirty-six percent of high school students report not having written any papers more than five pages long during the current school year.

Source: Indiana University, High School Survey of Student Engagement, *What We Can Learn From High School Students* (Bloomington, IN: Indiana University, 2005).

Student Achievement in College

Critical Thinking, Reading, Writing, and Mathematics Proficiency of Entering College Freshmen and Seniors (ETS)

Skill Dimension and Level	Entering Freshmen Classified as . . .			Seniors Classified as . . .		
	Not Proficient	Marginal	Proficient	Not Proficient	Marginal	Proficient
Critical Thinking	89%	9%	2%	77%	17%	6%
Reading, Level 2	55%	21%	24%	36%	22%	42%
Reading, Level 1	19%	25%	57%	10%	16%	74%
Writing, Level 3	72%	23%	6%	57%	32%	11%
Writing, Level 2	51%	36%	13%	36%	41%	23%
Writing, Level 1	13%	28%	59%	7%	20%	73%
Mathematics, Level 3	82%	14%	4%	73%	19%	8%
Mathematics, Level 2	48%	29%	22%	39%	29%	32%
Mathematics, Level 1	19%	30%	51%	14%	26%	60%

Sources: Educational Testing Service, Comparative Data Guide for Entering Freshmen at All Institution Types (2006), www.ets.org/Media/Tests/MAPP/pdf/tested_efreshmen.pdf; Educational Testing Service, Comparative Data Guide for Seniors at All Institution Types (2006), www.ets.org/Media/Tests/MAPP/pdf/tested_seniors.pdf. Reprinted by permission of Educational Testing Service, the copyright owner. No endorsement of this publication by Educational Testing Service should be inferred.

What Does Coursework Emphasize?

- Eighty-four percent of college seniors say their coursework emphasizes analysis of ideas, experiences, or theories "very much" or "quite a bit."
- Seventy-three percent say it emphasizes synthesis.
- Seventy percent say it emphasizes making judgments about the value of information, arguments, or methods.
- Seventy-nine percent say it emphasizes applying theories to practical problems or in new situations.
- Fifty-two percent have written at least one paper of twenty pages or more in length.
- Sixty-one percent have done or plan to do a culminating or "capstone" project.

Source: Indiana University, National Survey of Student Engagement, *Engaged Learning: Fostering Success for All Students* (Bloomington, IN: Indiana University, 2006).

Highlights of AAC&U Work on Student Preparation, Motivation, and Achievement

Liberal Education and America's Promise (LEAP)

Liberal Education and America's Promise (LEAP) is a ten-year campaign to champion the value of a liberal education—for individual students and for a nation dependent on economic creativity and democratic vitality. The campaign seeks to expand public and student understanding of what really matters in college—the kinds of learning that will truly empower students to succeed and make a difference in the twenty-first century.

One of the goals of the LEAP initiative is to provide evidence about how well today's college students are achieving key liberal education outcomes. Many colleges and universities involved in the initiative are also developing effective new ways to assess these key outcomes on their own campuses and in ways appropriate to their own missions. In its recently released report ***College Learning for the New Global Century,*** the LEAP National Leadership Council recommended a set of seven "Principles of Excellence" to create a more integrative and applied approach to liberal education.

★ **Principle 1: Aim High—and Make Excellence Inclusive**
Make the Essential Learning Outcomes a Framework for the Entire Educational Experience, Connecting School, College, Work, and Life

★ **Principle 2: Give Students a Compass**
Focus Each Student's Plan of Study on Achieving the Essential Learning Outcomes—and Assess Progress

★ **Principle 3: Teach the Art of Inquiry and Innovation**
Immerse All Students in Analysis, Discovery, Problem Solving and Communication, Beginning in School and Advancing in College

★ **Principle 4: Engage the Big Questions**
Teach through the Curriculum to Far-Reaching Issues—Contemporary and Enduring—in Science and Society, Cultures and Values, Global Interdependence, the Changing Economy, and Human Dignity and Freedom

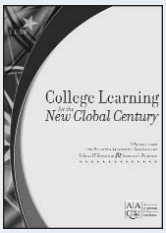
★ **Principle 5: Connect Knowledge with Choices and Action**
Prepare Students for Citizenship and Work through Engaged and Guided Learning on "Real-World" Problems

★ **Principle 6: Foster Civic, Intercultural, and Ethical Learning**
Emphasize Personal and Social Responsibility in Every Field of Study

★ **Principle 7: Assess Students' Ability to Apply Learning to Complex Problems**
Use Assessment to Deepen Learning and to Establish a Culture of Shared Purpose and Continuous Improvement

Selected Publications

College Learning for the New Global Century

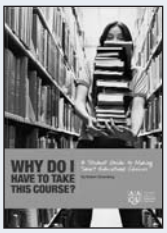


This report from AAC&U's Liberal Education and America's Promise (LEAP) initiative outlines and discusses the aims and outcomes of a twenty-first-century college education. It is also a report about the promises we need to make—and keep—to all students who aspire to a college education, especially to those for whom college is a route, perhaps the only possible route, to a better future. This report, based on extensive input both from educators and employers, responds to the new global challenges today's students face. It describes the learning contemporary students need from college, and what it will take to help them achieve it.

Purposeful Pathways: Helping Students Achieve Key Learning Outcomes

The final publication of the Greater Expectations initiative reports on practices from high school through college to advance four selected liberal education outcomes: inquiry, civic, global, and integrative learning. From defining outcomes, to reviewing current practices, to charting sequences of learning over time, readers will find numerous resources helpful in their curricular planning.

Why Do I Have to Take This Course? A Student Guide to Making Smart Educational Choices



This practical guide, written for undergraduate students, is intended to take some of the mystery out of curricular requirements and educate students about what really matters in college—the broad learning outcomes developed over the entire course of their undergraduate years. The ideas presented represent a consensus of contemporary thinking about the purposes of undergraduate education.

The Impact of Secondary–Postsecondary Learning Options on College Preparation

By Jennifer Brown Lerner, program associate, and **Betsy Brand,** director, both of the American Youth Policy Forum

With growing national concern regarding high school reform and college access and success, states, districts, and schools are making commendable efforts to address the problem of students' poor academic and socio-emotional preparation for higher education. Increasingly, states and school districts are implementing policies at the secondary level to increase the academic rigor of the curriculum, make schooling more relevant and engaging, and provide greater support and guidance to students.

One approach increasingly being used by states and districts to improve preparation for higher education encourages high school students to take college classes for credit. These programs combine rigor and relevance, increase the level of coursework, and connect coursework to the student's future plans. They also help high school students "try out" college-level classes, give them an opportunity to see themselves as college-goers, and demystify the "college" experience as, in many cases, these courses take place on a college campus. To be successful, these programs must operate at the intersection of secondary and postsecondary education. They present a unique opportunity for both systems to align their goals and to share resources and expertise to prepare all students for postsecondary education.

To better understand the impact and value of such programs, the American Youth Policy Forum (AYPF) engaged in an effort to identify, analyze, and describe schools, programs, and policies that link secondary and postsecondary education to help students earn college credit or take college-level courses. AYPF placed a particular emphasis on identifying programs serving first-generation, low-income, and low-performing students and underrepresented minorities. The findings are presented in *The College Ladder: Linking Secondary and Postsecondary Education for Success for All Students.* This compendium profiles twenty-two programs that have been evaluated or have outcome data, describes their impact upon students, and addresses a number of questions surrounding their effectiveness and viability.

Secondary–Postsecondary Learning Options

Because there is a wide range of programs that allow high school students to earn college credit, AYPF coined the term secondary–postsecondary learning options (SPLOs) to encompass them all. Secondary–postsecondary learning options are schools and programs that link high schools with two- and four-year institutions of higher education and allow high school students to participate in college-level courses, whether for credit or not for credit. *The College Ladder* catalogues SPLOs by program type, including dual enrollment, tech prep, middle and early college high schools, and programs serving disadvantaged student populations.

Dual Enrollment

Dual-enrollment programs provide opportunities for high school students to participate in college-level coursework in hopes of earning postsecondary credit. Programs are offered both on campuses of colleges or universities and in high school classrooms. In *The College Ladder*, the dual-enrollment section includes institution-specific dual-enrollment programs, Advanced Placement (AP), and statewide dual-enrollment programs with an emphasis on implementation at one site.

Tech Prep

Tech Prep is a planned sequence of study in a technical field that typically offers students the opportunity to earn postsecondary credit toward a technical certificate or diploma. Tech Prep is funded under the Carl D. Perkins Vocational and Technology Education Act through grants to states.

Middle/Early College High Schools

Both middle and early college high schools are located on or near a campus of a postsecondary education institution. These types of schools supplement their course offerings by enrolling students in college courses for both secondary and postsecondary credit. Middle college high schools graduate students with a high school diploma and some postsecondary credit. Most early college high schools encourage students to remain for a fifth year to graduate with both a high school diploma and an associate's degree or two years worth of transferable credit, although programs vary.

Programs Serving Disadvantaged Youth

A number of SPLOs are targeted at out-of-school or disadvantaged youth and provide an opportunity for them to participate in challenging, college-level coursework with appropriate support. Most of these programs are designed and operated by community colleges or community-based organizations in partnership with a postsecondary education institution.

Outcome Results

The College Ladder sought to identify evaluations of SPLOs within each of the identified categories, analyze their outcomes and impacts on various subgroups of students—particularly low-income and first-generation students—and report to policy makers and practitioners on the findings. Unfortunately, the search for program evaluations uncovered few third-party evaluations or programs with accurate data on student demographics. We also found that many evaluated programs served higher-achieving, more advantaged students, not the target population we identified.

Data limitations aside, the SPLOs in *The College Ladder* considered outcomes at both the secondary and postsecondary levels, but only a limited number of the included evaluations have longitudinal data tracking students through the transition from secondary to postsecondary education. Instead, most have outcome data at a specific point in time, such as at high school graduation or after one semester or one year of postsecondary education. While these outcomes are useful, they do not provide a complete understanding of the long-term effects of participation in an SPLO.

None of the evaluations in the compendium considered all the outcomes described below, and most collected data on only three to six outcome measures. Moreover, few (approximately 15 percent) of the included evaluations were able to compare these outcomes to a control group to determine if improved outcomes resulted from program participation and were statistically significant. Overall, the outcomes are generally positive, indicating that students participating in SPLOs receive some benefits due to participation. For the programs that had been evaluated with a comparison control group, SPLO participants typically outperformed their peers who did not participate in the SPLO. The following are the outcomes that various SPLOs measured.

Credits Earned during High School

Of the twenty-two programs in the compendium, over half (twelve) were able to provide the number of credits earned while in high school. Unfortunately, the evaluations typically do not indicate whether these credits are transferable to the institutions that students subsequently attended. Credits earned ranged from zero (for students who participated in a course but did not earn a grade eligible for credit) to two years' worth of credit or an associate's degree.

Performance on High School Standardized Tests

Seven of the evaluations included results of SPLO students' scores on state-mandated tests during high school. Often, such results were compared to scores of students in the district not participating in the SPLO to demonstrate that SPLO students were outscoring their peers.

High School Completion

Eleven of the included SPLOs, particularly those serving formerly out-of-school youth, reported high school completion rates. High school graduation is an important outcome for these students, since they generally are not on track to receive a credential. Other SPLOs reported their dropout rates and attendance rates, which typically were better than the district from which they drew students. Since some of the included SPLOs were targeting out-of-school youth or

students who were at risk of dropping out, there is some evidence that SPLOs help to decrease the district's overall dropout rate.

College-Going Rates

College-going rates are an important indicator, particularly for students who had not anticipated going to college prior to their participation in an SPLO. Of the included evaluations, fifteen provided information on the percentage of participants who graduated from high school and who enrolled or planned to enroll in postsecondary education upon completion of high school. On average, college-going rates for SPLO participants, especially middle- and low-achieving students, were higher than for nonparticipants. Evidence reveals that SPLOs are specifically increasing access for historically underserved student populations.

College Placement Tests

Six evaluations included college placement test scores when students applied to participate in an SPLO or when they became fully matriculated students after participation in an SPLO. Pre-program test scores were often used as admission criteria for SPLOs and served as a qualifier for participation in credit-bearing courses. A few evaluations included scores on placement tests administered once a student matriculated to an institution of higher education. Typically, students demonstrated mastery on these assessments and were subsequently placed in nonremedial, credit-bearing courses. However, some students with prior credit, mainly in technical areas, were unable to meet standards for nonremedial courses, usually academic courses. This is often because technical or vocational courses do not require students to demonstrate the same level of mastery in core subject areas such as English or math.

College Course Grades/Grade Point Averages (GPAs)

Nine of the included evaluations gathered information on student grades and GPAs when they participated in an SPLO or when they enrolled in postsecondary education. SPLO participants' grades and GPAs in college-level courses indicate whether students are adequately prepared and appropriately screened for participation. Some evaluations compared the course grades of dual-enrollment high school students in college courses with those of traditional college students. The results indicated that high school students in these programs typically do as well as or better than their traditional-age classmates. Consideration of student participants' grades upon matriculation, particularly in subject areas where students had earned prior credit, is an indication of how well the SPLO courses prepared students for college courses. On the whole, the information from the evaluations demonstrates that SPLOs are selecting students who are academically prepared for rigorous college-level coursework.

Retention

Five of the evaluations include student retention data for SPLO participants compared to data for nonparticipants in a college's or university's first-year class. Unfortunately, only two studies look at retention rates beyond the first semester or first year. The other three included retention data indicating that SPLO participants are more likely to persist from their first semester to their second semester and from their first year to their second, implying that high school students with some experience with college-level courses are able to make an easier transition into higher education.

Degree Attainment/Time to Degree

Six evaluations follow SPLO participants to college graduation or degree attainment. There is limited information on the time it takes SPLO participants to complete a degree. One of the included programs claims cost savings because of assumed shortened time to degree, but there is no convincing evidence from any of the included SPLOs of shortened time to degree, or that participating in an SPLO results in significant cost savings.

Job Market Outcomes

Five of the evaluations included self-reported job market outcomes. These evaluations were focused on students who had received technical training and/or occupational certificates through SPLOs. Two evaluations indicated that students with technical training received during high school through the SPLO were earning more than their peers who had not received specialized training. If not self-reported, job market outcomes are the most difficult to collect because they require tracking students from a postsecondary education data system into a labor market data system. Overall, the outcomes demonstrate that there are benefits for SPLO participants.

While many of these outcomes are promising, they typically do not address questions of long-term effectiveness, financial benefits, or cost saving from participation in SPLOs.

Findings and Lessons Learned

Based upon the profiles of twenty-two SPLOs, *The College Ladder* raises a number of issues for both practitioners and policy makers to consider. These include the type of student being served, funding to support SPLOs, formal sanctioning of programs, course rigor, extra support for student success, and transferability of credits.

Type of Student Served

SPLOs initially were designed to provide opportunities for high-achieving students to get a jump start on college. Over the years, as programs expanded, they began serving a more diverse student population, both in terms of race/ethnicity and achievement level. By serving a wider range of students, SPLOs are helping to ensure that more students are prepared for postsecondary education. However, many programs are still targeted to higher-achieving students, and some policy makers question whether lower-performing students should participate in such programs. Our research leads us to believe that SPLOs should be a key strategy to increase postsecondary access and success for all students.

Funding

Funding for SPLOs is a complex equation, since students are often simultaneously participating in secondary and postsecondary education. Both secondary and postsecondary education are funded through student headcounts, average daily attendance for K–12 schools, and full-time equivalent for institutions of higher education. As many questions arise on how to count students simultaneously participating in both systems, a reasonable solution would be to fund each institution based upon services provided. In addition, AYPF believes these funding formulas should include dollars to ensure advisers are available to help students navigate both systems.

Formal Sanctioning

While forty states have some legislation regarding participation of secondary students in postsecondary education, many SPLOs have grown as a result of local leadership and partnerships between high schools and colleges. As SPLOs continue to grow, federal, state, or local governments may play a regulatory role on issues related to SPLOs, such as funding, alignment of programs and systems, equitable access, transferability of credit, and quality and accountability.

Course Rigor

AYPF identified four programmatic characteristics that help to define course rigor, including program location, faculty preparation, prerequisites for participation, and program length. These aspects of SPLOs can be used as indicators of the rigor of the course and generally of the SPLO. Although there is not strong evidence to indicate that any of these factors are critical to ensuring SLPO courses are "college-level" and not "college-like," they provide insight into the teaching, instruction, and alignment of SPLO course offerings. Ultimately, there is a tension between the desire to allow any student to participate in college courses and the desire on the part of the college to maintain certain standards.

Extra Support for Student Success

Caring adult advisers, academic assistance and tutoring, college success classes, and a safe environment with a peer support network are the four most common extra supports found throughout the SPLOs included in *The College Ladder*. These additional services prove critical to the success of SPLOs working with more disadvantaged student populations, out-of-school youth, students at risk of dropping out of high school, and middle- and low-achieving students, but can be beneficial to all SPLO participants.

Transferability of Credit

The ideal goal of SPLOs is to have students earn college credit that can be used upon matriculation to postsecondary education. Unfortunately, students are often unaware that they have earned credit or have portability beyond the awarding institution. Some SPLOs have designed credit to be extremely portable—for example, credit based upon scores on a culminating exam such as the AP program. On the other hand, some institutions do not have strong articulation agreements or clear credit transfer policies, thus making it difficult for students to determine if they can use the credit earned through an SPLO.

Conclusion

While AYPF lacks strong empirical data to make sweeping claims about the value of SPLOs, it is clear they help students complete high school, access more rigorous curricula, think about college in their future, and subsequently succeed upon matriculation. SPLOs have the potential to promote a new approach to learning for high school students that breaks down the barriers between high school and college, thus increasing students' chances for future success in college and work and as citizens. ■

Twenty-First-Century Skills for Tomorrow's Leaders

By Juliana Texley, adjunct professor, Palm Beach Community College; former superintendent of schools for Anchor Bay, Michigan; and twenty-five-year veteran classroom teacher

If only educators had crystal balls . . . if there were surefire ways to predict what learning styles or experiences would ensure that a student would do well in college or his or her career, then designing school programs would be easy.

Unfortunately, the "world series of life" is far more difficult to predict than the score of a baseball championship. Some students who take a general curriculum do as well as those in a program that identifies their specialty early. Some straight-A students find the freedom of college too tempting and lose their organizational skills, while some homeschoolers blossom in academia.

For almost a century, national testing agencies have boasted that their assessments have a high predictive validity for success in the first two years of college—and they have been right. High SAT or ACT scores correlate well to grades in the introductory language and mathematics courses in most colleges and universities, but that says far more about the way most first-year college courses are structured than about student success. Linguistic learners with good concentration skills and narrowly defined cultural literacy do well in the required introductory courses in most schools.

In most colleges, the rules for success change in the junior or senior year, where classes get smaller and students are required to do more research and writing. Once a student graduates, many careers present a totally new game entirely. Communication is still important, but having a great vocabulary is far less important than knowing when to say the right thing and when to keep quiet. On the job, individual content areas merge and there's no "reference manual" to guide the problem-solving process. The sorts of team efforts that many colleges define as "cheating" become the best performance standards, and the creativity that wreaks havoc on a multiple-choice test is just what earns many employees an end-of-year bonus.

To the dismay of the testing agencies, many colleges have de-emphasized college entrance scores in favor of a multivariate selection matrix that includes grades, cocurricular activities, portfolios, and interviews. Experienced counselors get to know which colleges value the eclectic resume of the cocurricular king or queen, and which are more impressed by a portfolio of art or essays. The colleges are using their own models for predictive validity because they have their own data to show what makes a student successful *in their programs*.

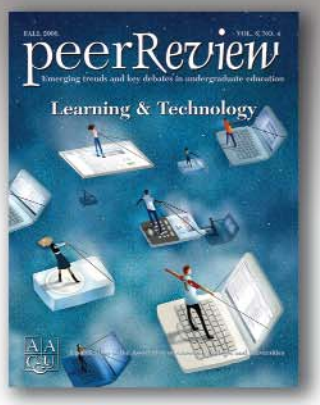
Yet with all the assessment we do, there must be evidence of *core abilities* that contribute to success in college and career. Here's what the data show.

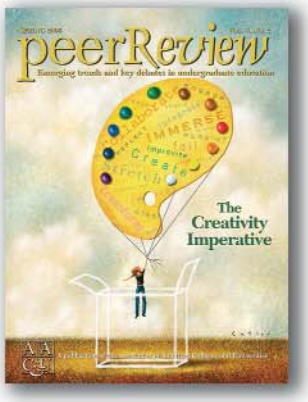
First, basic skills can't be denied. Several studies have shown that the closest correlate to college graduation from high school isn't vocabulary or athletic letters, but successful completion of algebra II! It's unclear whether that's because of the logic necessary to succeed in three years of secondary mathematics or simply the persistence to achieve in a relatively boring subject.

The second component of success in college today is found in the cluster of technology skills often dubbed "twenty-first-century competencies." These are the new tickets to success in college and career:

- The ability to search, find, and evaluate information on the Web.
- Web-style reading skills, which are very different from the sort of left-to-right sequential pattern that most older adults learned in school.
- Communication skills, synchronous and asynchronous.
- Multimedia production skills—the ability to integrate text, images, and video.

Few of these key areas of preparation are parts of the standard college-preparatory curriculum, and there isn't much time to add new classes to our all-too-short school days. So it's absolutely vital that educators take a hard look at the experiences that are intrinsic to every course, from middle school through grade fourteen, to ensure an integrated and constantly updated sequence of twenty-first-century skills for tomorrow's leaders. (For more information, see www.21stcenturyskills.org.) ■





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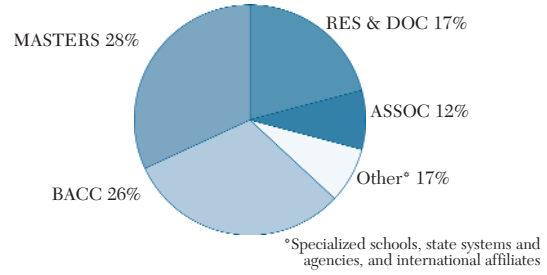

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