AC 2012-3001: BACCALAUREATE DEGREE COMPLETION: STUDENT RECRUITMENT, OUTREACH, AND RETENTION

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Baccalaureate Degree Completion: Student Recruitment, Outreach, and Retention

Introduction

The continuing demand for technical and engineering personnel is critical to the economic welfare in today's rapidly changing technologies and competitive environment. This paper will outline a pathway to 4-year university through the partnership with community colleges. The focus will be on the approach from community college to university. The structure of the paper will include:

- Need for technical personnel,
- Legislative Mandate: California Senate Bill 1440,
- Transition and articulation of a 2+2 program,
- Student outcomes, and
- Future plans.

Need for Technical Personnel

The strength of US economy, and of California, and the success of its workforce will be based upon the presence of an education system that ensures the development of strong academic and technical skills. Education has been linked to economic success for generations. In the 50s and 60s, schools were asked to improve math and science skills, and in the 70s, we began to see the early rumblings of both Pacific Rim and European countries entry into the competitive global marketplace.

A common economy, information super highway, advanced communication systems and other advanced technologies have forever changed the marketplace. Our students no longer compete with students from the next town, or big city, but are in competition with students on a global scale. We must provide the kind of educational system that will propel our students into leadership positions in this new world economy. Employers require those new graduates and job-seeking candidates, to have improved written, oral, communication, mathematics, and science that they need to succeed in the workplace.

Can US and California remain competitive in the global marketplace? The jobs are available, but the skilled employees are not[1]. Due to lack of skilled employees and their importance to our economic survival the need of our business and industries are not being met, which is leading to an economic meltdown in the US[2]. The authors of 'America's Choice High Skills or Low Wages', argue that we must become proactive in a quest for a technically minded workforce in order to assure future generations the prosperity the US has always enjoyed or suffer the consequences of being a supplier of low-skilled, low-wage workers to the rest of the world[3]. How might US close this skill gap? Of immediate concern to many leaders is the need to bolster the skills of young people in the 16-24 age group. What happens to these young people who stop their education short of a university degree? For many, they bounce from one entry-level job to another, never able to embark on a promising career path.

The number of students who embark on a science or engineering educational pathway in California public institutions undergo an astonishing rate of attrition from high school to college. And, although transfer is the primary mission of California Community Colleges (CCC), they now have the lowest transfer rate in the nation[4]. The CCC/CSU transfer success rate in science and engineering is only 8%. Only 4% ultimately obtain a four-year degree.

Legislative Mandate: California Senate Bill 1440[5]

Currently, courses necessary to transfer to a California State University or the University of California campus differs from the courses needed to earn an associate degree. To meet workforce demands in a cost-effective way, motivating students to earn an associate degree while preparing for transfer to a four-year college or university, and appreciating that they have completed a transfer preparation course pattern, provides students encouragement to complete their educational pursuits. This bill known as Student Transfer Achievement Reform Act, commencing with the fall term of the 2011–12 academic year, a community college district shall grant an associate degree to a student in his or her field of study that shall consider the student eligible for transfer into a California State University baccalaureate program with the following requirements:

- Completion of 60 semester (90-quarter) units that are eligible for transfer to the California State University.
- The Inter segmental General Education Transfer Curriculum (IGETC) or the California State University General Education-Breadth Requirements.
- A community college district may require a higher grade point average and the completion of specific prerequisite courses for impacted programs or campuses.
- A community college district shall not impose any requirements in addition to the requirements of this section, including any local college or district requirements, for a student to be eligible for the associate degree and subsequent admission to the California State University.
- This section shall not preclude students who are assessed at below collegiate level from acquiring remedial non-collegiate level coursework in preparation for obtaining the associate degree.
- Remedial non-collegiate level coursework shall not be counted as part of the transferable units required.
- The California State University shall grant a student priority admission to a program or major that is similar to his or her community college major or area of emphasis.
- The California State University may require a student transferring pursuant to this article to take additional courses so long as the student is not required to take any more than 60 additional semester (90-quarter) units at the California State University for majors requiring 120 semester (180-quarter) units.
- Specified high unit majors shall be exempt from this subdivision upon agreement by the Chancellors of the California State University and the California Community Colleges and their respective academic senates.
- The California State University shall not require students transferring pursuant to this article to repeat courses that are similar to those taken at the community college that counted toward the associate degree granted.

CA Research

Community Colleges across the country, including those in California, are devoted to increasing student retention, success, persistence, and completion of a certificate, degree or transfer to a senior university. This can be accomplished, according to recent research, by having students to choose their major(s) early, rather than accumulating credits that do not apply directly to their major. The results of a research by Moore and Shulock[6] point to three recommendations:

1. Entering a program of study is a critical milestone on the path to completing a college certificate or degree;
2. Choosing a major early, the more likely they are to complete a certificate, degree or transfer; and
3. Providing a clear course pattern for students' successful guidance.

Furthermore, Moore and Shulock present that the 'efforts to increase completion will be more successful if the access mission of the colleges is re-conceived as providing access to well-structured programs rather than to a collection of courses that may not add up to a coherent program of study.

Transition and Articulation of a 2+2 program

One of the more important elements of articulation agreement between a community college and a senior university is that it serves as the avenue for establishing a framework that links courses, define common core of math, science, communication and technical curricula for all students. However, many graduates of community colleges continue to pursue their higher education to a four-year degree level. The model presented here is thus a 2+2, that is:

- Students start with community college, by completing an associate degree, and
- Students then continue with two more years towards a four-year degree.

In this model, in addition to related subject matters such as mathematics, sciences, and other general education courses, students learn skills in technical courses among others. Bakersfield College recognizes the value of the educational experience provided, and students upon graduation, have the opportunity to continue their education at California State University, Bakersfield (CSUB) with a guaranteed admission and without losing any of the units they have already earned. Bakersfield College and California State University, Bakersfield now have an articulation agreement for this purpose.

BC-CSUB Long Partnership Serving the Community

Many local companies require engineers that must be attracted from outside the region since there was no opportunity to earn a baccalaureate degree in the county. Many BC engineering graduates seek entrance into other CSU and UC campuses. However, many of the engineering programs in these institutions are impacted due primarily to funding reduction by the State. It was necessary for CSU, Bakersfield to develop a pathway for BC engineering majors to complete the engineering Bachelor of Science degree.

BC and CSUB started to collaborate in 2007 by aligning programs in STEM and identifying gaps. The two institutions submitted joint proposals to secure external funding with success. BC is able to provide increased student support and faculty development. CSUB initiated a new engineering program that by Fall 2012 will include baccalaureate degrees in computer engineering, electrical engineering, and engineering sciences. In particular, engineering sciences will provide students with a general engineering background that will meet the local needs of most companies. In addition, concentrations in areas of specific interest will be developed such as petroleum engineering, project engineering management, agricultural engineering, water and environmental engineering, power engineering and others.

Both institutions have already agreed on a student plan that guarantees degree completion in four years in computer science and computer engineering. The plan is unique in that the emphasis is on student success by distributing the course work needed for degree completion among both institutions: two years at BC taking courses in general education and the major continuing with two years at CSUB that completes the general education and degree requirements.

Both institutions have also agreed on sharing student data to increase connection to both institutions early on, which is a known indicator for student completion. In this sense, CSUB maintains a permanent office and staff on the BC campus to facilitate student transfer. The staff works closely with the BC counselors to ensure timely documentation of the student progress.

Student Outcomes

The emphasis in the CSU system is to facilitate graduation with an initiative that sets goals for the six-year graduation rate by 2014-15. The goals of this initiative also address reducing the graduation gap between under-represented minorities (URM) and non-URM students. In the case of students graduating in STEM fields, the URM are significantly underrepresented. When taking into consideration that according to the 2010 census, sixty-four percent of those under the age of 18 in the County of Kern are Hispanic and the fact that less than ten percent enter STEM careers, it is critical to reduce the graduation gap for the good of the country. Higher education institutions need to at least triple the number of Hispanics participating in STEM degree pathways in the next five years in order to maintain a competitive 21st century workforce, according to the National Academy of Sciences[7].

Since strong ties were formed in directing STEM students directly from BC to CSUB, the total number of transfers since Fall 2007 through Fall 2011 in STEM is 322. There has been a 25% increase in the number of STEM transfers each year and a further increase is anticipated with the introduction of engineering at CSUB. The six-year graduation at CSUB for all students has been about forty percent for the years 1998-2005. In comparison the CSU system graduation rate is about fifty-two percent. The six-year graduation rate of transfers at the junior level has been around sixty percent for the same time period at CSUB for all majors.

The founding cohort of 63 students starting computer engineering in Fall 2011 at CSUB is well prepared with more than ninety percent taking college level mathematics, no remedial courses. Of these, seven students transferred from BC at the junior level and will graduate in spring 2013. Another six BC freshman students majoring in computer engineering have taken advantage of

the newly signed memorandum of understanding (MOU) between BC and CSUB that guarantees graduation in 2+2 years. This MOU follows the conclusions of Moore and Shulock by guiding the students through the curriculum right from the start.

The six-year graduation rate in STEM at CSUB is averaging about 38% for the 1998-2005 years. This rate is similar for the CSU system. It is too early to know the impact on the six-year graduation rate of the collaboration established between BC and CSUB but the indications are that the students are progressing satisfactory. This is due primarily to close tracking of student progress and ensuring that the required courses are timely offered to these students.

Conclusion and Future Plans

CCC Research and Planning group research in engineering transfer was very informative in determining how to better serve transfer students through intersegmental coordination because it was specifically focused on assessing the engineering transfer pipeline in the California public higher education system. This study found that the current pipeline is too long, too leaky and urgently needs improvement[8].

As with any plan, specific steps must be identified and implemented to ensure its success including:

- A class schedule that guarantees availability of courses based on students' needs;
- Enhanced professional development for faculty and academic advising staff, so that they can provide guidance to students;
- Involve students early to choose a major, and assign academic advisors in their chosen programs.

There is a general realization that tomorrow's job require college experience and these articulation agreements should emphasize more academic skills. In other words, math skills in general are valuable and jobs in the 21st century require technical knowledge, but they also demand learner flexibility and adaptability to change.

Bakersfield College, has built strong partnerships with senior universities. Community colleges are now the primary providers of technological education, and senior universities are turning to community college for their students. By working cooperatively and sharing scarce resources, we can educate the professional needed to compete in the new world economy.

In partnership with BC, CSUB is moving forward rapidly to develop a Center for Collaborative Interdisciplinary Teaching and Research to accelerate the establishment of a modern STEM education program, which produces equitable learning and degree completion. This Center will have all the qualities recommended by the National Academy of Engineering (NAE) as "levers" of change in educational practice. Faculty development will be the main lever for university-wide progress toward becoming more learning-centered. STEM faculty at CSUB will adopt evidence-based best practices for promoting learning and degree completion and become models of the teamwork, collaboration and interdisciplinary thinking that the STEM students must develop.

BC and CSUB will continue to establish intersegmental articulation of STEM pathway and new concentration in terms of consistent, sequential learning outcomes by

- Conducting transfer audit/gap analysis to identify current gaps in BC/CSUB STEM pathway;
- Achieving seamless course/student learning outcome alignment as new curricula are developed through extensive CSUB/BC intersegmental faculty to faculty collaboration;
- Making dual/cross enrollment a reality rather than a false promise through productive collaboration/seamless alignment;
- Establishing structures and mechanisms for continuous improvement of pathway articulation in terms of student learning outcomes; and
- Integrating student learning outcomes (SLO) assessment fully into the STEM programs.

The joint effort between BC and CSUB to track student progress to retain and graduate them in STEM is well underway with the participation and support of community partners. Our model of collaboration is working and it is offered as an example for others to reproduce.

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