PIPELINE-IN-A-BOX:
Promoting Advancement of CS/IT Students from Two-Year to Four-Year Institutions

ccg**i**t

COLORADO
COALITION FOR
GENDER AND
INFORMATION
TECHNOLOGY

Pipeline-in-a-Box: Promoting Advancement of CS/IT Students from Two-Year to Four-Year Institutions is a complete set of resources for strengthening the relationship between community colleges and four-year institutions in order to increase the number of women and underrepresented minorities graduating with computer science (CS) or information technology (IT) baccalaureate degrees. *Pipeline-in-a-Box* provides the data, recruitment materials, and relationship-building techniques you need to build the transfer prestige of two-year colleges, and build diversity within four-year CS/IT programs.

NATIONAL · SCIENCE · FOUNDATION

AVAYA

Microsoft

Pfizer

Bank of America

ACTION GUIDE

Pipeline-in-a-Box outlines five steps for strengthening the transfer relationship between community college and four-year institutions. The Box maps a strategy for starting an initiative between institutions to enhance recruitment and increase student retention.

GETTING STARTED

1 MAKE YOUR CASE
for recruiting community college students into four-year computer science/IT baccalaureate programs.

2 BUILD YOUR TEAM
to strengthen connections between administration, faculty, and advisors at local community colleges and four-year institutions.

3 RECRUIT COMMUNITY COLLEGE STUDENTS
from fields like CS/IT, business, criminal justice, and health using effective partners, like advisors and faculty, and effective practices.

4 ARTICULATE TRANSFER PATHWAYS
and determine an efficient and coherent "path of least resistance."

5 RETAIN AND GRADUATE THEM
Understand the needs particular to community college students, including underrepresented minorities, and accommodate them whenever possible to help with retention and to increase completion rates.

national center for
women&
INFORMATION
TECHNOLOGY

NATIONAL CENTER FOR WOMEN & INFORMATION TECHNOLOGY   »   ncwit.org

ccgit

1

MAKE YOUR CASE

for recruiting community college students into four-year computer science/IT baccalaureate programs.

Step 1 is completed by individuals who initiate the transfer pipeline effort, whether they are administrators, faculty or advisors at two- or four-year institutions. In Step 1, you use recommended materials and advice to make the case within your school and within the partnering institution.

Overcome misperceptions about community college students

A persistent misperception exists in academia that community college students are less capable students who do not have the skills to succeed in four-year CS/IT programs.

Once community college students successfully transfer to a four-year institution, they graduate at nearly the same rate as those students who began at the four-year school, and do well enough to garner similar job opportunities and wages as the "native" four-year students. Also, many four-year-eligible post-secondary students are choosing community college for their first two years of study to defray high costs of higher education. When they transfer, these highly qualified students excel.

References:

Rifkin, T. (2000). Improving Articulation Policy to Increase Transfer. (Policy paper No. CC-00-5). Denver, Colorado: Education Commission of the States.

Dougherty, K. (1992). Community colleges and baccalaureate attainment. The Journal of Higher Education, 63(2), 188-214.

Selingo, J. (2007, March). Role reversal. Prism: American Society for Engineering Education, 26-31.

Understand the benefits of computer science/IT careers

According to the U.S. Department of Labor, 9 of the 30 fastest growing occupations are in computer science/IT. In 2006, Money magazine reported that Software Engineer was the best job in America based on high salary, growth, flexibility, creativity, and low stress.

References:

http://www.bls.gov/emp/mlrtab2.pdf

http://money.cnn.com/popups/2006/moneymag/bestjobs/frameset.1.exclude.html

Diversify to amplify learning

A misconception regarding expanding the community of CS/IT students and practitioners suggests that accommodating a new type of CS/IT student will cause a "dumbing down" of curricula, which would be detrimental to current, more traditional CS/IT students.

In fact, research suggests that interaction with diverse students amplifies learning outcomes such as group problem solving, creativity, and perspective-taking skills, and increases breadth of knowledge for ALL students in higher education, regardless of a student's race, GPA, SAT, background, or gender.

References:

Chang, M. J., Witt, D., Jones, J., & Hakuta, K. (2003). Compelling Interests: Examining the evidence on racial dynamics in higher education. Palo Alto, CA: Stanford Press.

Gurin, P., Dey, E., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. Harvard Educational Review, 72(3), 1-32.

Enrollment

CS/IT degree programs at four-year institutions have shown a drop in enrollment. There are especially low numbers of women and underrepresented minorities enrolled in four-year CS/IT programs. But relatively high numbers of women and underrepresented minorities attend community colleges.

Tapping into this pool of students could alleviate declining numbers studying CS/IT at four-year institutions, and boost the numbers of women and underrepresented minorities in CS/IT fields.

References:

Jessup, E., Sumner, T., & Barker, L. (2005). Report from the trenches: Bringing more women to the study of computer science. Boulder, CO: Alliance for Technology, Learning, and Society National Center for Women & Information Technology By The Numbers

---

SUGGESTED RESOURCES:

» Materials in the folder titled: Convincing Data and Profiles

» Materials in the folder titled: Recruitment Materials and Programs

---

national center for
women &
INFORMATION TECHNOLOGY

ccgit

2 BUILD YOUR TEAM

to strengthen connections between administration, faculty, and advisors at local community colleges and four-year institutions.

Step 2 is led by individuals who initiate the transfer pipeline effort. In this step, you use recommended materials and advice in order to build an effective cross-institution "pipeline" team.

Initiate

contact between local community college and four-year administration, faculty, and advisors. Let your potential team members know about this resource, *Pipeline-in-a-Box*, and its ideas for collaboration.

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled:
>   Tools for Initiating Contact

Persuade

potential team members at local community colleges and four-year institutions to play along.

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled:
>   Convincing Data and Profiles
>
> » Materials in the folder titled:
>   Recruitment Materials and Programs

Exchange

pertinent contact information that team members and students can use to verify transfer pathways and determine "path of least resistance."

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled:
>   Tools for Initiating Contact

Build

your team by holding a blockbuster meeting with two-year and four-year representatives to discuss collaboration goals and refining articulation agreements.

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled:
>   Team Meeting Materials
>
> » Materials in the folder titled:
>   Articulating Transfer Pathways
>
> » Materials in the folder titled:
>   Community College to Four-Year Transfer
>
> » Materials in the folder titled:
>   Convincing Data and Profiles (if necessary)
>
> » Materials in the folder titled:
>   Recruitment Materials and Programs (if necessary)

3

RECRUIT COMMUNITY COLLEGE STUDENTS
from fields like CS/IT, business, criminal justice, and health using effective partners, like advisors and faculty, and effective practices.

In Step 3, the cross-institution team equips community college faculty and advisors with the information and materials they need to successfully recruit students. Included also are resources for recruiting university "near peers" to reach out to community college students.

Provide

community college advisors and faculty with materials from Step 1 (if they don't have them already).

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled: Convincing Data and Profiles
>
> » Materials in the folder titled: Recruitment Materials and Programs

Ask

community college advisors the question: "What would convince you the most to encourage students to explore local CS/IT-related baccalaureate programs?" And use their answers to provide data, material, and experiences that *do* convince them!

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled: Convincing Data and Profiles

Recruit

"near peers" in four-year programs to reach out to community college students through road show presentations, "hangout" sessions, and four-year campus visits.

> **SUGGESTED RESOURCES:**
>
> » Materials in the folder titled: Recruitment Materials and Programs

ccg**it**

4

ARTICULATE TRANSFER PATHWAYS
and determine an efficient and coherent "path of least resistance."

In Step 4, the team plans for ways to ease the transfer pathway, and modifies materials provided in order to communicate transfer processes to students.

Understand

local articulation agreements and compare to exemplary agreements.

Evaluate

your articulation agreements and how transfer is practiced in real life; if they're broken, try to fix them, or learn the best way to work the system by figuring out the "path of least resistance."

Provide

easy-to-understand (and follow!) information about articulation and transfer to community college students (and faculty and advisors); include contact information for four-year program advisors.

Consider

constructing a bridging program to prepare community college transfer students for success in a four-year CS/IT related program.
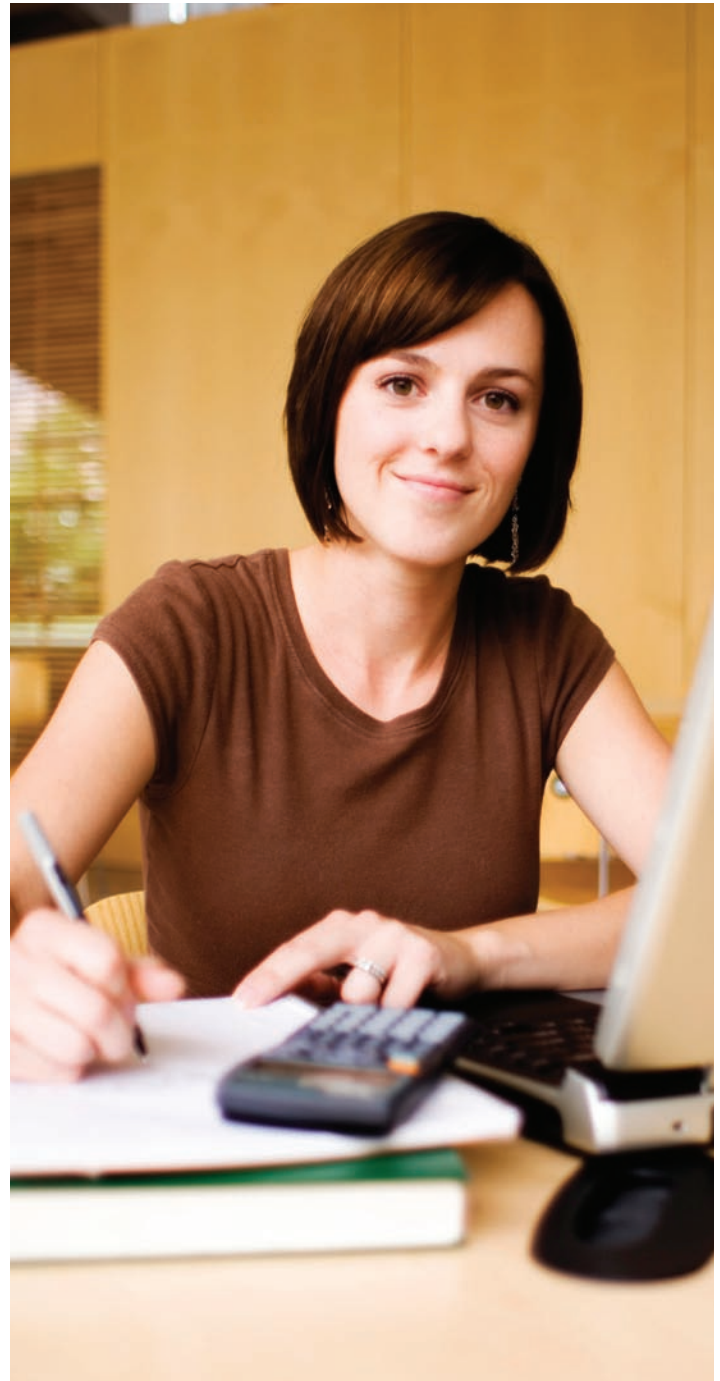
SUGGESTED RESOURCES:

» Materials in the folder titled: Articulating Transfer Pathways

» Materials in the folder titled: Community College to Four-Year Transfer

5

RETAIN AND GRADUATE THEM

Understand the needs particular to community college students, including underrepresented minorities, and accommodate them whenever possible to help with retention and to increase completion rates.

Step 5 is carried out by the four-year institution.

Bolster

community college to four-year student success by offering a bridge course or other preparatory programs.

Cultivate

mentorships for transfer students using CS/IT faculty, graduate students, and more advanced undergraduates.

Execute

NCWIT's Promising Practices for retaining women and underrepresented minorities.

SUGGESTED RESOURCES:

» NCWIT Promising Practices, available at wwww.ncwit.org/practices. (Please see Pipeline-At-a-Glance for a list of suggested retention Practices.)

» Materials in the folder titled: Community College to Four-Year Transfer