The Engineering Transfer Experience

The Student View from the Beginning, Middle and Completion of the Transfer Journey

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RP Group’s Collaborative Model of Institutional Research

Primary Responsibility
- Faculty/Staff
- Researcher
- Joint Activity

Key Features:
- Dialogue-rich
- Jointly-driven processes

Collaborative Dialogue on Student Success

- Research Request
- Collaboratively explore research questions
- Determine what evidence will help answer the questions
- Explore next steps
- Conduct research & analysis
- Dialogue to interpret results
- Act on findings
Meet the Prospective Transfer Students

• Mande
  – I work 40 hours a week as a security agent.
  – I did not realize that I should not have followed IGETC until I met Professor Mayer.
  – I did not know about the assessment office so I took two math classes that covered stuff I already knew from high school in India
Meet the Prospective Transfer Students

• Khiet
  – I am a veteran – used to be in the Navy
  – I support a family so I have to work full time
  – I had several false starts and thought for a time I could get by without a degree
  – I’m determined to succeed. I have planned every step I need to take
Meet the Prospective Transfer Students

• Peter
  – I want to do get a BS in Mechanical Engineering
  – I am a part-time student who works 30 hours a week. It’s hard because my work is an hour away so I spend lots of time commuting
  – Next semester, I’ll be full time taking 22 units. My girlfriend will help pay the bills and I won’t work.
  – I tried Engineering at a private for-profit college several years ago. It didn’t work out and I still owe $18K
  – I’m good at math, but have not taken physics before
Context

Two Paths to Transfer & BA/BS Degrees

- Transfer
- BA/BS

Number of students planning to transfer

< shorter

Time elapsed

longer >

Improved Transfer Path

Current Path
Range of Transfer Goals

• Expand pipeline
• Increase % pipeline participants who reach the transfer point
• Reduce time and increase speed to transfer (transfer velocity)
• Encourage students to complete as much coursework in major as possible prior to transfer
• Reduce time and units to completion of BA/BS
The Case of Engineering

Research Activities:

- **Beginning:** Survey and focus group 55 students in pipeline to transfer and “follow” 16 students as they move through pipeline
- **Middle:** Survey and focus group 178 transfer students currently attending these programs at UC, CSU, Private Nonprofit
- **End:** Backward map path taken by 4,200 transfer students who completed BS Programs in Engineering 1996-2009
Beginning –
Getting into the pipeline

Who are engineering students?

Intro to Engineering Course (n=37)

• Ethnicity Students in Intro to Engineering:
  62% Asian/PI; 18% White; 6% Latino; 3% African American

• Ethnicity College Population:
  18% Asian/PI; 20% White; 26% Latino; 16% African American

• Gender Engineering Students: 14% female
• Gender College Population: 54% female
Beginning –
Getting into the pipeline

Additional findings profiling engineering students @
beginning of pipeline

• Typical jobs held: barista, fast food service,
retail/sales, security
• Major factor in choosing transfer institution: Affordability

<table>
<thead>
<tr>
<th>Knowledge of Transfer Requirements to Preferred Univ.</th>
<th>All Students</th>
<th>Students w. Ed Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>69%</td>
<td>92%</td>
</tr>
<tr>
<td>No</td>
<td>31%</td>
<td>8%</td>
</tr>
</tbody>
</table>
Beginning –
Getting into the pipeline

What are engineering students’ most serious challenges?

- Balancing requirements of work and school (46%)
- Over enrollment in required courses (41%)
- Calculus (38%)
Middle: Survey Content

• Activities, resources and people at the CC that students feel have contributed to transfer
• Perceived transfer obstacles, and factors that facilitated transfer
• Factors that influenced the choice to attend that particular university and program
• Compared to the “native” students in your program, how prepared were you to begin upper-division coursework?
• Advice to CC students about to transfer
• Advice to newly transferred students
• Post-transfer experience
Middle: Factors Facilitating Transfer

<table>
<thead>
<tr>
<th>What or who motivated you to pursue transfer? (select all that apply)</th>
<th>UC Davis Engineering</th>
<th>SJSU Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was my personal educational goal</td>
<td>91%</td>
<td>85%</td>
</tr>
<tr>
<td>Job/career advancement</td>
<td>62%</td>
<td>52%</td>
</tr>
<tr>
<td>Expectations of family/friends</td>
<td>58%</td>
<td>43%</td>
</tr>
<tr>
<td>Encouragement of CC teacher(s)</td>
<td>26%</td>
<td>11%</td>
</tr>
<tr>
<td>Encouragement of CC counselor(s)</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Encouragement of high school teacher(s)</td>
<td>6%</td>
<td>9%</td>
</tr>
<tr>
<td>Encouragement of high school counselor(s)</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>Support from employer</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Confidence gained from earning AA/AS</td>
<td>4%</td>
<td>6%</td>
</tr>
</tbody>
</table>
# Middle: Factors Complicating Transfer

<table>
<thead>
<tr>
<th>Factor</th>
<th>UC Davis</th>
<th>SJSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of attending university</td>
<td>3.1</td>
<td>2.9</td>
</tr>
<tr>
<td>Need to work to support self, family</td>
<td>2.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Unclear guidance from CC teachers/counselors</td>
<td>2.1</td>
<td>2.2</td>
</tr>
</tbody>
</table>

4 – Significant Challenge  
3 – A Challenge  
2 – Minor Challenge  
1 – Not a Challenge
## Middle: Factors Driving Choice of Transfer Institution

<table>
<thead>
<tr>
<th>Factor</th>
<th>UC Davis</th>
<th>SJSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program meets my ed/career goals</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Location of the college/university</td>
<td>3.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Affordability</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Program’s Reputation</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Financial aid available</td>
<td>3.4</td>
<td>3.5</td>
</tr>
<tr>
<td>Close to home</td>
<td>3.3</td>
<td>3.6</td>
</tr>
</tbody>
</table>

5 – Very Important
4
3
2
1 – Not Important
Middle: Relative State of Preparation

Compared to classmates in your major who started as Freshmen at this university, how prepared were you for upper division coursework?

<table>
<thead>
<tr>
<th></th>
<th>Don’t know</th>
<th>Well below</th>
<th>Slightly below</th>
<th>Equal</th>
<th>Better prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJSU Eng</td>
<td>12%</td>
<td>10%</td>
<td>15%</td>
<td>41%</td>
<td>22%</td>
</tr>
<tr>
<td>SJSU Acct</td>
<td>16%</td>
<td>4%</td>
<td>12%</td>
<td>42%</td>
<td>26%</td>
</tr>
</tbody>
</table>
Middle: Pre-Transfer Advice

“Try to get all the math, physics, and chemistry done at the community college. Take an introductory engineering class so you know if you really want to do this or not. Check out assist.org and the university course catalog to get a clear idea of all prerequisites needed and what will transfer.”
Middle: Pre-Transfer Advice

“Make sure you see your counselor and make an education plan. Use assist.org to make sure your courses transfer over. Try to take most of your lower division classes before transferring if you can. GE classes are usually harder to get into since they are always in demand.”
Middle: Post–Transfer Advice

“Take advantage of all the special tutoring programs offered by the Learning Assistance Office; tutoring offered by specific majors offices such as math, physics, engineering, chemistry, and biology; and tutoring from special honor society clubs from specific engineering disciplines.”
Middle: Post–Transfer Advice

“Start the process of getting your credits evaluated immediately. Keep your paper work straight and very, very organized! Research, read, and educate yourself as much as possible bout the courses you need to take. BUY THE SCHOOL CATALOG AND READ IT!”
Middle: Post-Transfer Advice

“Join clubs and organizations, study in groups, attend office hours. Make continuous trips to your advisors and get your financial aid prepared well ahead of time.”
End: Backward Mapping

Number of CCs attended by degree completers

- Accounting (N=2,118)
- Engineering (N=4,219)
- Nursing (2,820)

Number of Community Colleges Attended

- 1: 65% Accounting, 48% Engineering, 37% Nursing
- 2: 48% Accounting, 24% Engineering, 29% Nursing
- 3: 29% Accounting, 7% Engineering, 14% Nursing
- 4+: 29% Accounting, 4% Engineering, 10% Nursing
- 4+: 9% Accounting, 4% Engineering, 10% Nursing
End: Backward Mapping

CC math course work completed by degree completers

- Intermediate Algebra or Below: 2%
- Statistics/Finite Math: 3%
- Pre-Calculus: 7%
- Calculus: 24%
- Above Calculus: 65%
End: Backward Mapping

Time-to-Transfer for Completers

Based on study of 4,219 students at 19 universities who earned a BA in Engineering between 1996-2009 after completing a minimum of 12 transferable units at a CCC.
End: Backward Mapping

Unit-Transfer for Completers

Based on study of 4,219 students at 19 universities who earned a BA in Engineering between 1996-2009 after completing a minimum of 12 transferable units at a CCC.
End: Backward Mapping

Time-to-Transfer & Time-to-Degree for Completers

Data source: California Partnership for Achieving Student Success.
Based on 4,219 students at 19 universities who earned a BA in Engineering btw 1996-2009 after completing a minimum of 12 transferable units at a CCC.
End – Backward Mapping

Challenge: Decreasing Time-Degree:

Finding
• Students who transfer with fewer units spend more time at universities completing degrees
• Students who transfer with many units (86+) were as likely as those who transfer with fewer units to take 2-3 years to complete their BS and almost as likely to take 3-4 years to do so as those with fewer units

Explaining the Findings
• Students may be completing units that do not transfer
• Students may need to complete General Ed course requirements after transfer
• Students might perceive that courses at CC do not provide sufficient preparation
Multivariate Analysis

• Multiple regression

• Dependent Variables
  – Time to Degree from 1st Postsecondary Enrollment (TTD)
  – Time to Transfer (TTT)
  – Time at University (TAU)
  – Total Community College Units Earned (CCUE)
  – Total University Units Earned (UnivUE)
  – Swirl (Number of Community Colleges Attended)

• Predictor Categories
  – Demographics, enrollment patterns, unit loads, course taking, student services, cohort effects
Multivariate Analysis-Findings

- Exploratory Analysis
- ↑ CC Summer units → ↓ TTT and TTD
- Special admit in high school → ↓ TTT and TTD, ↑ Swirl
- Take math first term at CC → ↓ TTT and TTD
- ↑ Level math at CC → ↓ UnivUE, TAU, and TTD (not TTT)
- ↑ Withdrawals → ↑ TTT, TAU, TTD, and Swirl
- Swirl patterns differ among ethnicities:
  - Whites less likely to swirl
  - Hispanics less likely to swirl in Engineering and Nursing
  - African-Americans more likely to swirl in Accounting and Nursing
RP Group’s Collaborative Model of Institutional Research

Key Features:
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Collaborative Dialogue on Student Success

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Research Wheel: Engineering Transfer Study

- Dialogue to Interpret Findings
- Explore Next Steps
CTE Web Page & Contact Information

CTE Transfer Study Web Page
www.rpgroup.org/css/CTETransfer.html

Eva Schiorring
eschiorring@rpgroup.org
SB 1440: Associate Degree for Transfer Bill

*Effective Fall 2011-2012:*

Guaranteed admission to a CSU with junior status for those who complete an AA for Transfer by completing 60 transferable semester units that include:

- CSU or IGETC Certification pattern
- 18 semester units in major/concentration area
- 2.0 GPA
SB 1440: Associate Degree for Transfer Bill

- Associate Degree for Transfer students will have priority admission— but not guaranteed admission-- to program/major corresponding to their CC major/emphasis.
- CSU can require students to take additional courses, but no more than 60 additional semester units.
- CCC faculty is responsible for degree content.
SB 1440: Associate Degree for Transfer Bill

• High Unit Majors exempted upon agreement by CSU and CCC Chancellors and Academic Senates
SB 1440: Associate Degree for Transfer Bill

- CCC Academic Senate launched statewide effort to develop model curriculum in most popular majors
- CCC and CSU Academic Senates outlining implementation principles
- Intersegmental faculty have begun to design transfer model curriculum
### Number of Students Transferring into Engineering in FALL Terms at CSU East Bay From CCs in Region

<table>
<thead>
<tr>
<th>College</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Chabot College</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>College Of Alameda</td>
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<tr>
<td>College Of San Mateo</td>
<td>1</td>
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<td></td>
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<tr>
<td>Contra Costa College</td>
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<td>1</td>
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<td>1</td>
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<td>2</td>
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<tr>
<td>De Anza College</td>
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<td>2</td>
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<td>3</td>
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<tr>
<td>Diablo Valley College</td>
<td>2</td>
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<td>1</td>
<td>2</td>
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<td>Mission College</td>
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<td><strong>5</strong></td>
<td><strong>4</strong></td>
<td><strong>3</strong></td>
<td><strong>9</strong></td>
<td><strong>4</strong></td>
<td><strong>7</strong></td>
<td><strong>3</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

Source: California Post-secondary Education Commission.