

# Engineering Transfer Students:

## *Understanding Factors that Facilitate Student Success*

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Creating Pathways for STEM Transfer Student Success  
National Institute for the Study of Transfer Students (NISTS)  
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Asheville, NC



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**Welcome** to the Community College Leadership Program (CCLP) website. Here you will find information about graduate programs and professional development opportunities for community college professionals, as well as information about the Office of Community College Research and Policy (OCCRP).

### VIDEOS



**ISU Community College Leadership Programs**

Higher Education Administration

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### News & Events

- ▶ STEM article featured in Community College Times
- ▶ OCCRP Team presents research at STEM Pathway Conference
- ▶ "Two minutes with Larry Ebbers"
- ▶ Starobin and Laanan study community college role in STEM
- ▶ Laanan is commencement speaker at Southwestern Community College
- ▶ Linda Serra Hagedorn assists effort to export U.S. community college model to Indonesia
- ▶ Larry Ebbers : a NASPA Legacy
- ▶ Linda Serra Hagedorn serves as ASHE president.
- ▶ Frankie Santos Laanan serves as ACTER president.
- ▶ Ignacio Hernandez is selected as Fellow for NCCHC.
- ▶ Marisa Rivera is selected to participate in the Future Leaders Institute (FLI).
- ▶ Soko Starobin receives the 2010 Barbara K. Townsend Emerging Scholar Award from CSCC.
- ▶ Frankie Santos Laanan receives the CHS Mid-Career Achievement in Research Award.
- ▶ Larry Ebbers presents at the "Preparing Tomorrow's Transportation Workforce: A Midwest Summit".

### Archive



## IOWA STATE UNIVERSITY

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# About OCCRP

- The Office of Community College Research and Policy (OCCRP) at Iowa State University is focused on *creating, sharing, and applying knowledge in the context of community college education*.
- The mission of the OCCRP is to *articulate and analyze the issues affecting policy and practice* by conducting rigorous research which impacts students, faculty, administrators, and policymakers.
- The OCCRP is *committed to sharing our research with diverse constituents* through dissemination efforts such as publications, conference presentations, and professional workshops



# Research Projects

## **SEEC: Student Enrollment and Engagement through Connections**

STEM Talent Expansion Program



## **Pathway to a STEM Degree**

Gender in Science and Engineering

## **Student and Organizational Learning: Preparing the 21st Century Technicians**

Advanced Technological Education

## **Evaluation of Project Lead The Way in Iowa**

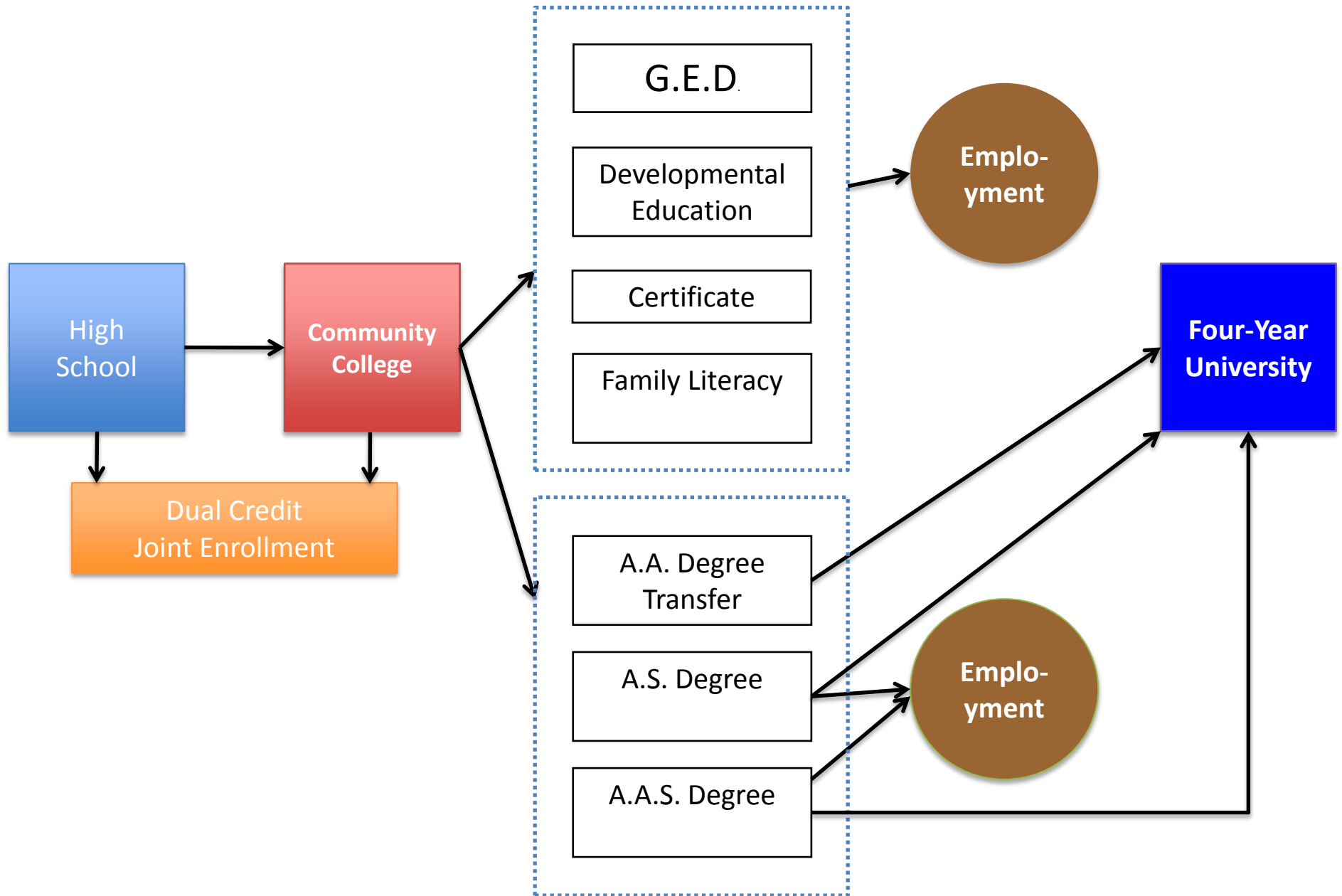
The Kern Family Foundation and the Iowa Mathematics and Science Education Partnership (IMSEP)

# Why Transfer? Why Now?

- Community colleges are the *largest postsecondary education segment* and its share of the undergraduate population is likely to increase.
- Community college students *want to transfer*.
- Community colleges will *prepare more students for transfer* in the future, especially students from middle-class backgrounds.
- Community colleges *attract students from underserved groups* in greater numbers than four-year colleges and universities.
- Community colleges *cost less to attend* than four-year institutions.
- Community colleges are *more accessible* than four-year institutions.

Source: Handel, S. J. (2011). Improving student transfer from community college to four-year institutions: Perspectives of leaders from baccalaureate-granting institutions. College Board, July 2011.

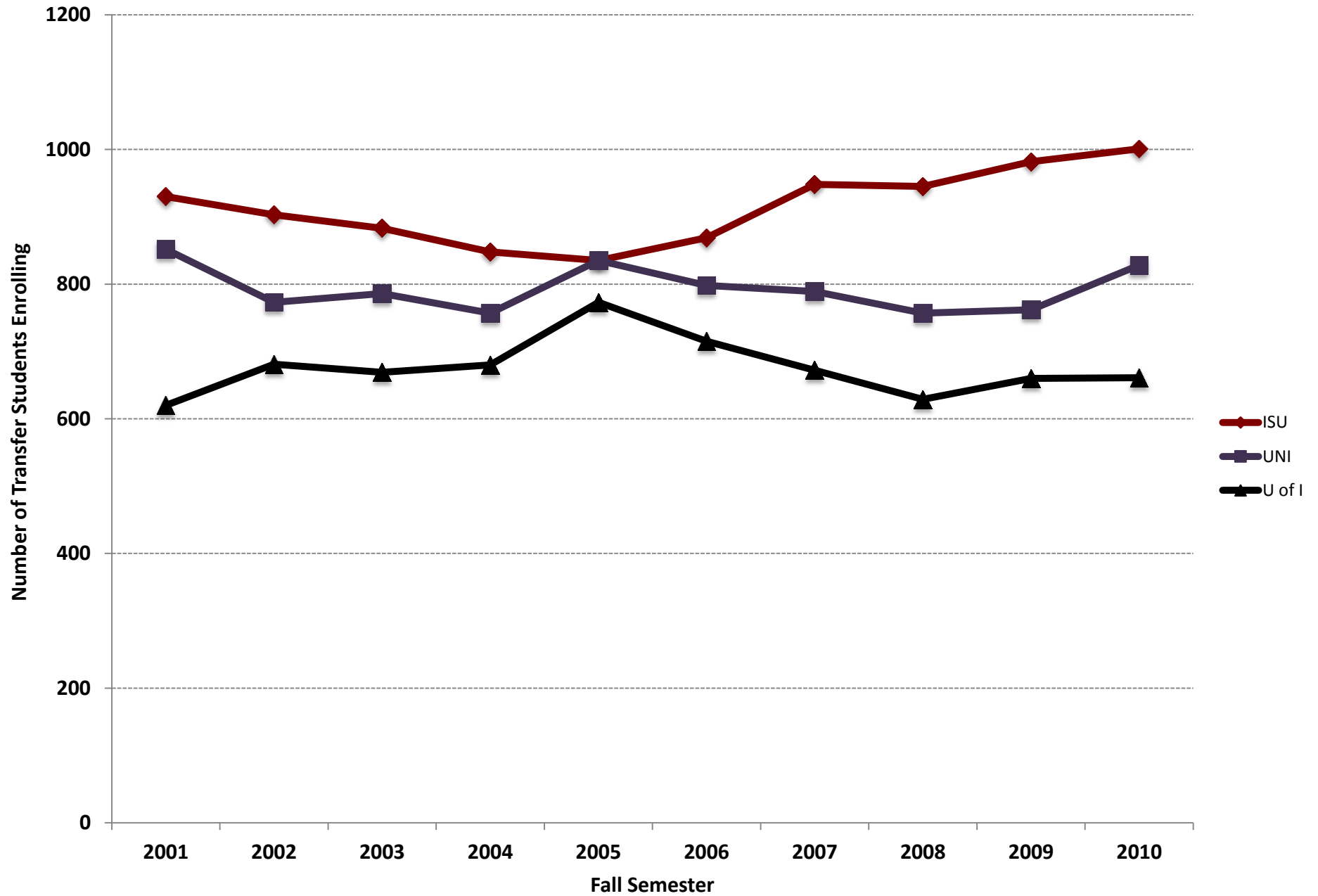
# Figure 1. Conceptual Framework of Educational Trajectories via Community College



# Why study transfer students?

- Demographics of students who begin at Iowa's public community colleges
- Academic preparation and degree completion
- Community college effect
- Retention and graduation rates
- STEM Pathways
- University experience and student success
- Use data to inform practice, policy and future research.

## Iowa Community College Transfer Students: Enrollment by Regent Universities





# Transfer Students

- Completion of an associate degree and attainment of a high transfer GPA appear to be related to higher retention and graduation rates at the Regent universities for transfer students.
- Students who transferred from Iowa community colleges in Fall 2008:
  - AA or other associate degree: higher one-year retention rate (**83.3%**)
  - No associate degree: (76.6%)

Source: Annual Report on Student Retention and Graduation Rates. Board of Regents, State of Iowa. Agenda Item 19, February 3-4, 2010.

# Transfer Students

- Students who transferred from Iowa community colleges in Fall 2005:
  - AA or other associate degree: higher four-year graduation rate (**64.2%**)
  - No associate degree: (56.1%)

Source: Annual Report on Student Retention and Graduation Rates. Board of Regents, State of Iowa. Agenda Item 19, February 3-4, 2010.

# Transfer Students

- There is a significant difference in one-year retention rates when transfer GPA is considered.
- Students in the entering class of Fall 2008:
  - 3.50-4.00: **88.6%**
  - 3.00-3.24: 78.4%
  - 2.50-2.74: 77.1%
  - 2.00-2.24: 60.3%
- Minority students in 2008 entering class had a lower one-year retention rate (78.1%) than non-minority students (80.0%).

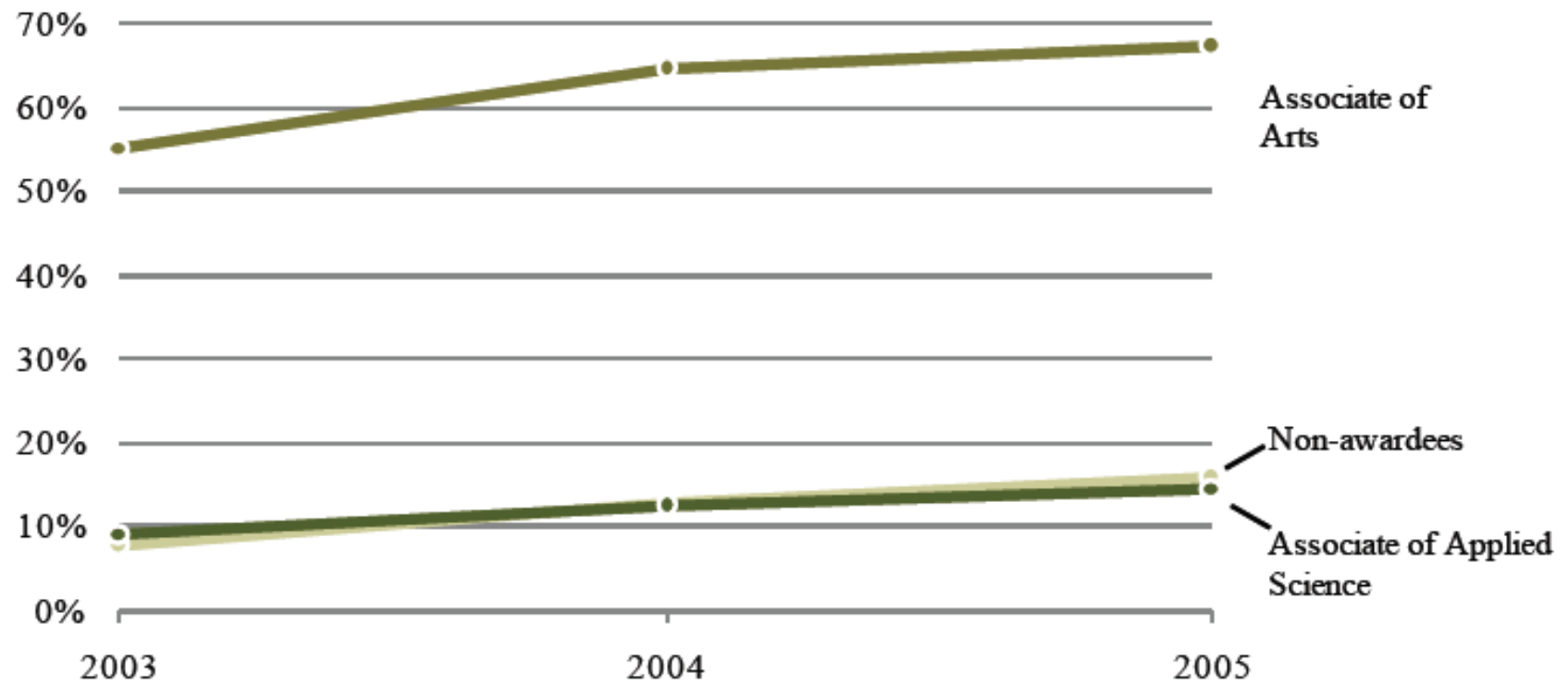
Source: Annual Report on Student Retention and Graduation Rates. Board of Regents, State of Iowa. Agenda Item 19, February 3-4, 2010.

# Transfer Students

- The number of transfer students at the Regent universities increased by 124 students (+3.2%) from 3,851 in Fall 2009 to 3,975 in Fall 2010.
- Approximately 62% (2,458) of all transfer students at the Regent universities in Fall 2010 were from Iowa public community colleges.
- In Fall 2009, there were 100,736 students enrolled in Iowa community colleges; approximately 64% were enrolled in college parallel (transfer programs).
- During FY 2009, there were 4,817 Iowa CC students who received an AA award; and 1,165 Iowa CCs received an A.S. award.

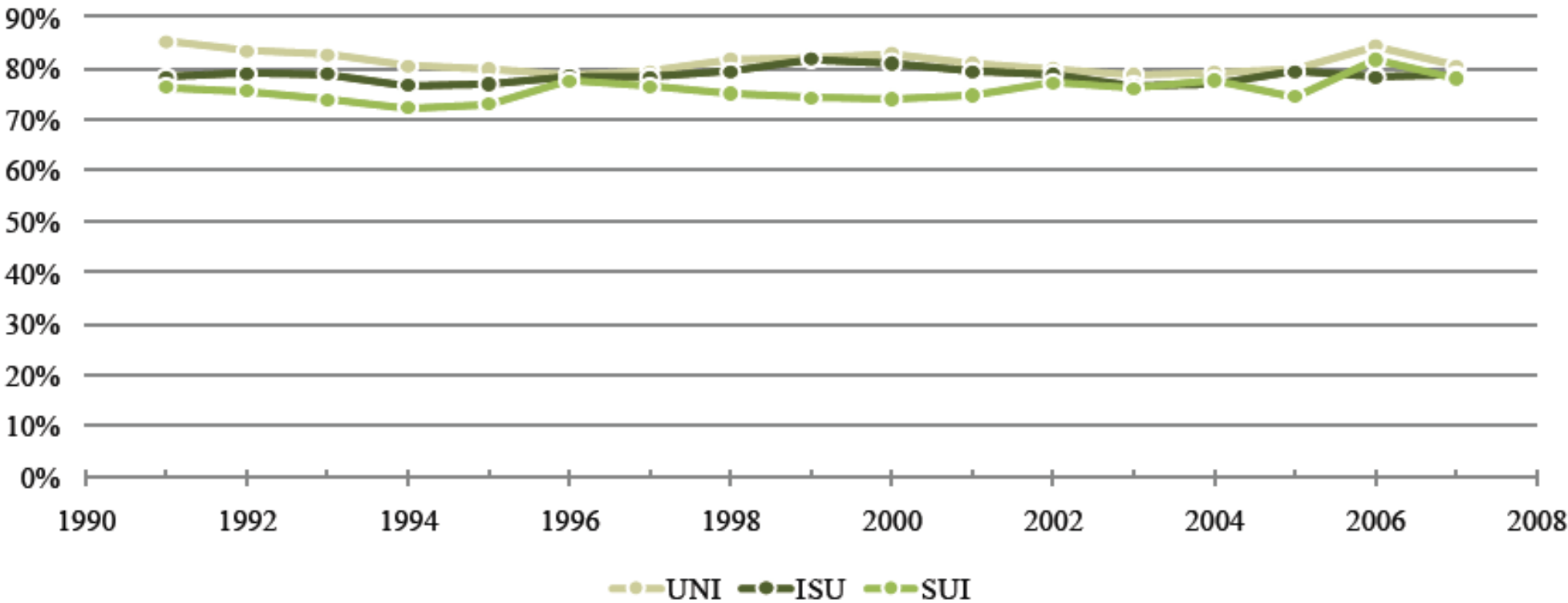
Source: Annual Report on Student Retention and Graduation Rates. Board of Regents, State of Iowa. Agenda Item 19, February 3-4, 2010.

**Figure 12-8: Three-year Transfer Rates by Award Type: 2002 Cohort**



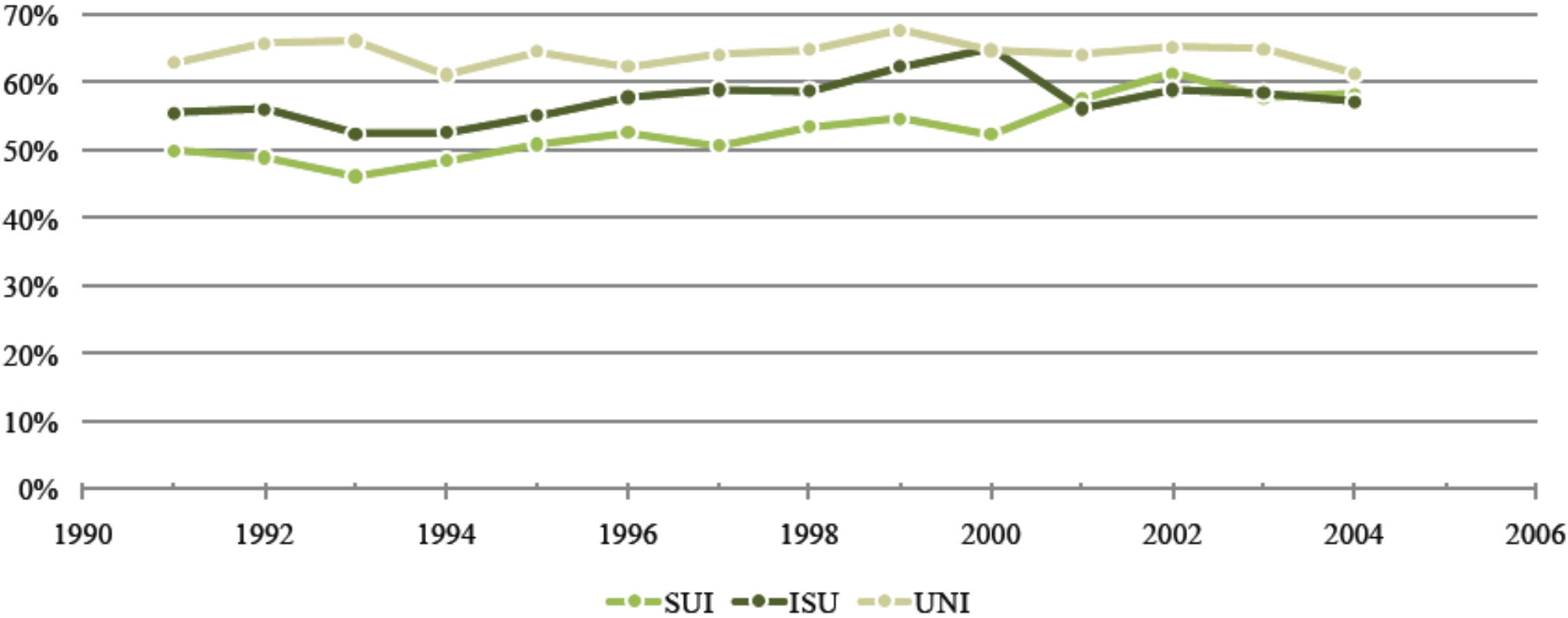
SOURCE: Iowa Department of Education, Division of Community Colleges and Workforce Preparation, Community College MIS and National Student Clearinghouse, see Table 12-16.

**Figure 12-9: Retention Rate for Transfer Students at Public Universities: 1991-2007**



SOURCE: Iowa Department of Education, Division of Community Colleges and Workforce Preparation, Community College MIS, and National Student Clearinghouse, see Table 12-17.

**Figure 12-10: Graduation Rate for Transfer Students at Public Universities: 1991-2004**



SOURCE: Iowa Department of Education, Division of Community Colleges and Workforce Preparation, Community College MIS, and National Student Clearinghouse, see Table 12-18.



# IOWA STATE UNIVERSITY

A tall, brick clock tower with a Gothic-style spire and three arched windows, set against a clear blue sky. The tower is partially obscured by lush green trees in the foreground.

## Iowa Community College Transfer Students

Profiles, Experiences, and Perceptions



# Transfer Student Questionnaire (TSQ)

- Measure transfer students' community college and university experiences
- Survey developed by Laanan (1998)
- Online survey
- Administered to Iowa CC transfer students at Iowa State University (ISU)
- Three waves of data collection (2007, 2009, 2011).
- Data for over 2,000 transfer students

# Transfer Student Questionnaire (TSQ)

- Background Characteristics
- Community College Experiences
  - General Courses
  - Academic Advising/Counseling Services
  - Transfer Process
  - Course Learning
  - Experience with Faculty
  - Learning and Study Skills
- University Experiences
  - Reasons that influence decision to attend ISU
  - Course Learning
  - Experiences with Faculty
  - General Perceptions of ISU
  - Adjustment Process
  - College Satisfaction
- Open-Ended Questions

**Online Survey  
instruments:**

**TSQ**

**E-TSQ**

# Academic Advising

## Percent Responding Somewhat Agree-Strongly Agree

Question	Community College
Consulted with AA regarding transfer	67.5
Information received was helpful in the transfer process	62.5
Met with AA on a regular basis	38.2
Talked with AA about courses to take, requirements, educational plans	67.5
Discussed plans with AA for transferring to 4-year college or university	66.9
AA identified courses needed to meet the GE requirements, major, etc.	60.5

# Transfer Process

## Percent Responding Somewhat Agree-Strongly Agree

Question	Community College
Researched various aspects of university to get a better understanding of environment and academic expectations	67.8
I knew what to expect at the university in terms of academics	62.4
Visited the university campus to learn where offices and departments were located	76.5
Spoke to academic counselor at university about transferring and major requirements	63.1
Visited the admissions office at university	63.1
Spoke to former CC transfer students to gain insight about their adjustment experiences	31.8

# Course Learning

## Percent Responding Often-Very Often

Question	Community College	Iowa State University
Took detailed notes	70.0	86.0
Participated in class discussions	67.6	50.0
Tried to see how different facts and ideas fit together	79.7	84.6
Thought about practical applications of the material	77.0	90.9
Integrated ideas from different sources into projects	66.8	76.3
Explained material to another student or friend	71.0	78.5

# Experiences with Faculty

## Percent Responding Often-Very Often

Question	Community College	Iowa State University
Visited faculty and sought advice on class projects	39.2	38.2
Felt comfortable approaching faculty outside of class	67.6	43.1
Asked my instructor for information related to a course	55.4	45.8
Visited informally and briefly with an instructor after class	48.7	23.8
Discussed my career plans and ambitions with a faculty member	34.6	19.4
Asked my instructor for comments and criticisms about my work	37.2	23.6

# General Perceptions of ISU

## Percent Responding Somewhat Agree-Strongly Agree

Question	Iowa State University
ISU faculty are easy to approach	70.4
ISU faculty tend to be accessible to students	68.3
Because I am a community college transfer, most faculty tend to underestimate my abilities	22.2
Because I am a community college transfer, most students tend to underestimate my abilities	32.6
ISU is an intellectually stimulating and often exciting place to be	85.5
If I could start over again, I still would go to ISU	90.0
I would recommend to other transfer students to come to ISU	91.0

# Open-Ended Questions

## **What factors helped you adjust to the university?**

- Making friends
- Family and friends
- Advisement
- Provide more rigorous and transferable classes
- Study skills
- Prepare for large university setting (reduce transfer shock/transition)



# Open-Ended Questions

**If you could give some advice to CC students who will be transferring, what would that advice be?**

- Consult with academic counselor
- Get involved
- Make sure classes transfer
- Enhance study skills/form study groups
- Be prepared and ask for help

# STEM Student Enrollment and Engagement through Connections

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The STEM Student Enrollment and Engagement through Connections (SEEC) project seeks to increase the number of engineering graduates at Iowa State University by approximately 100 per year. The means to that end are connections rooted in community: learning communities, community colleges, and Iowa communities. The project is collaborative between Iowa State University (ISU) and Des Moines Area Community College (DMACC). The cornerstone of SEEC is the success of learning communities for recruitment and retention, and the project builds upon Iowa State's established learning community infrastructure, leadership, and expertise. Retention at DMACC and ISU will be increased by a new learning community model, called a learning

## Fast Facts about ISU Engineering

The College of Engineering continues to be ranked among the top 25 public engineering colleges in the country, according to the graduate and professional school rankings.

The programs are among the top 10 in the Midwest among all engineering colleges (USN & WR ranking).

## Data Briefs

[SEEC Data Brief: Engineering Admissions Partnership Program \(E-APP\) \(PDF\)](#)

November 2010

[SEEC Data Brief: Engineering Orientation \(EGR 100\) \(PDF\)](#)

November 2010

[SEEC Data Brief: SEEC Engineering Transfer Student Profile \(PDF\)](#)

# Overall Grant Goal

Increase College of Engineering graduates to 900, by approximately 100 per year. Included with this goal are increases in the number of pre-engineering students at DMAACC and in the percentages of women and minority students in engineering at ISU and DMAACC.

# SEEC: STEM Student Enrollment and Engagement through Connections

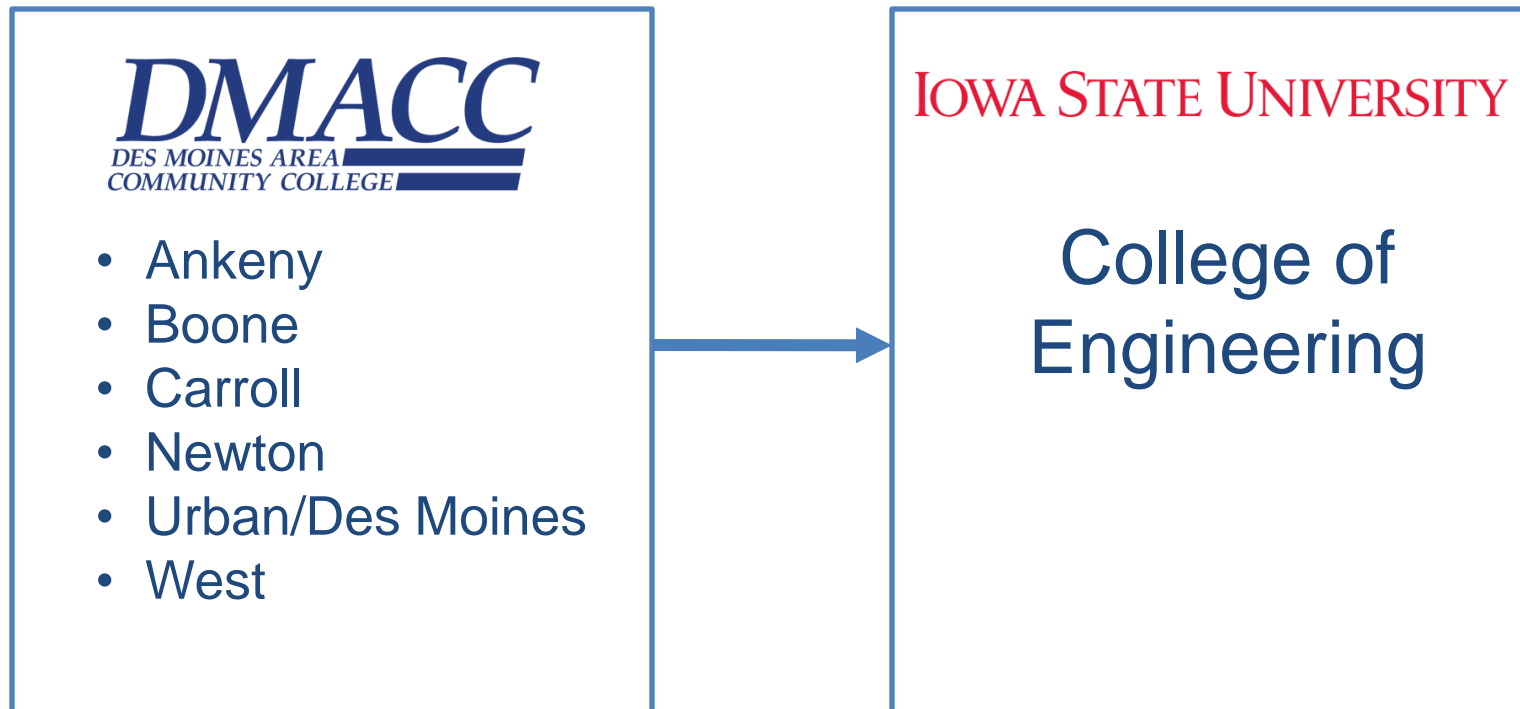
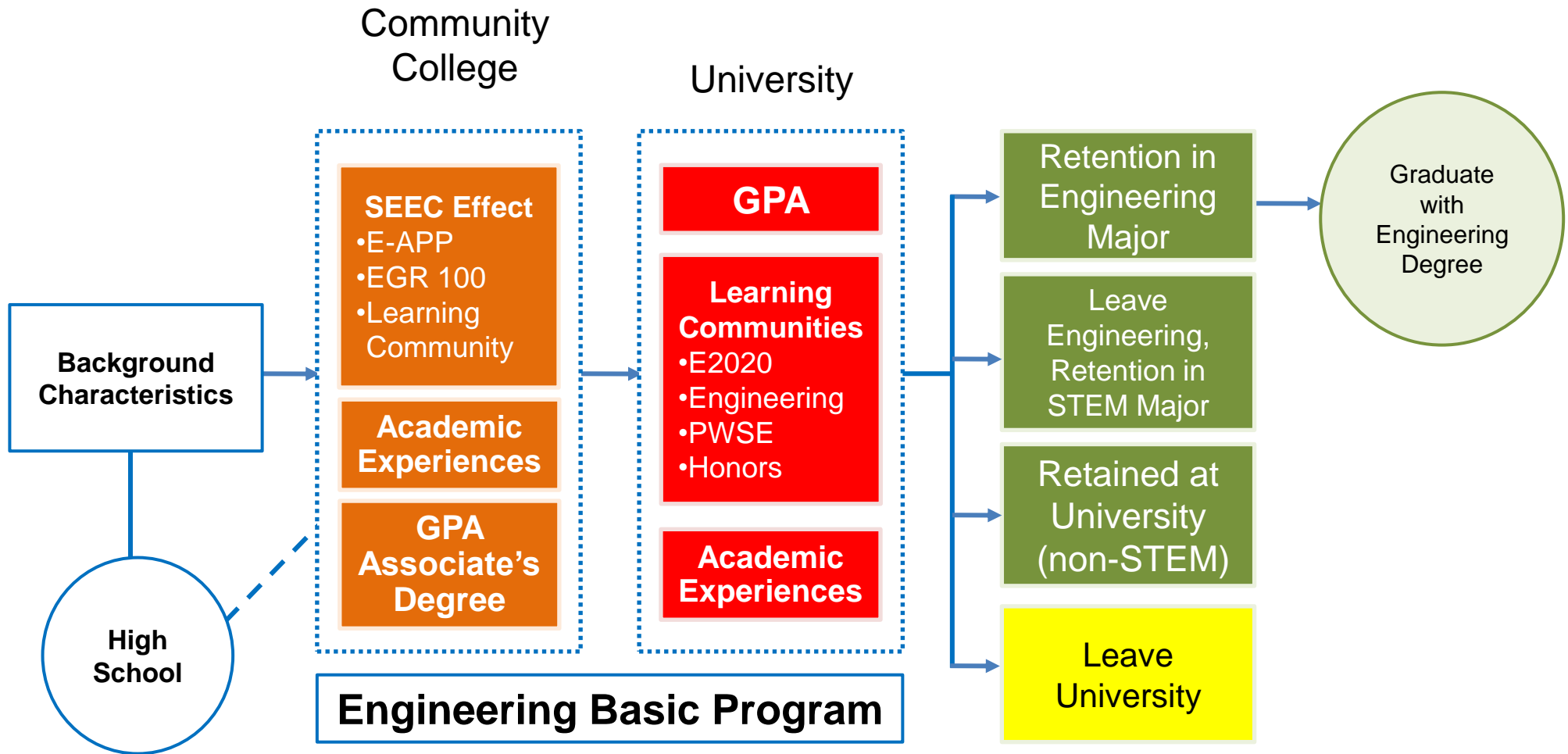
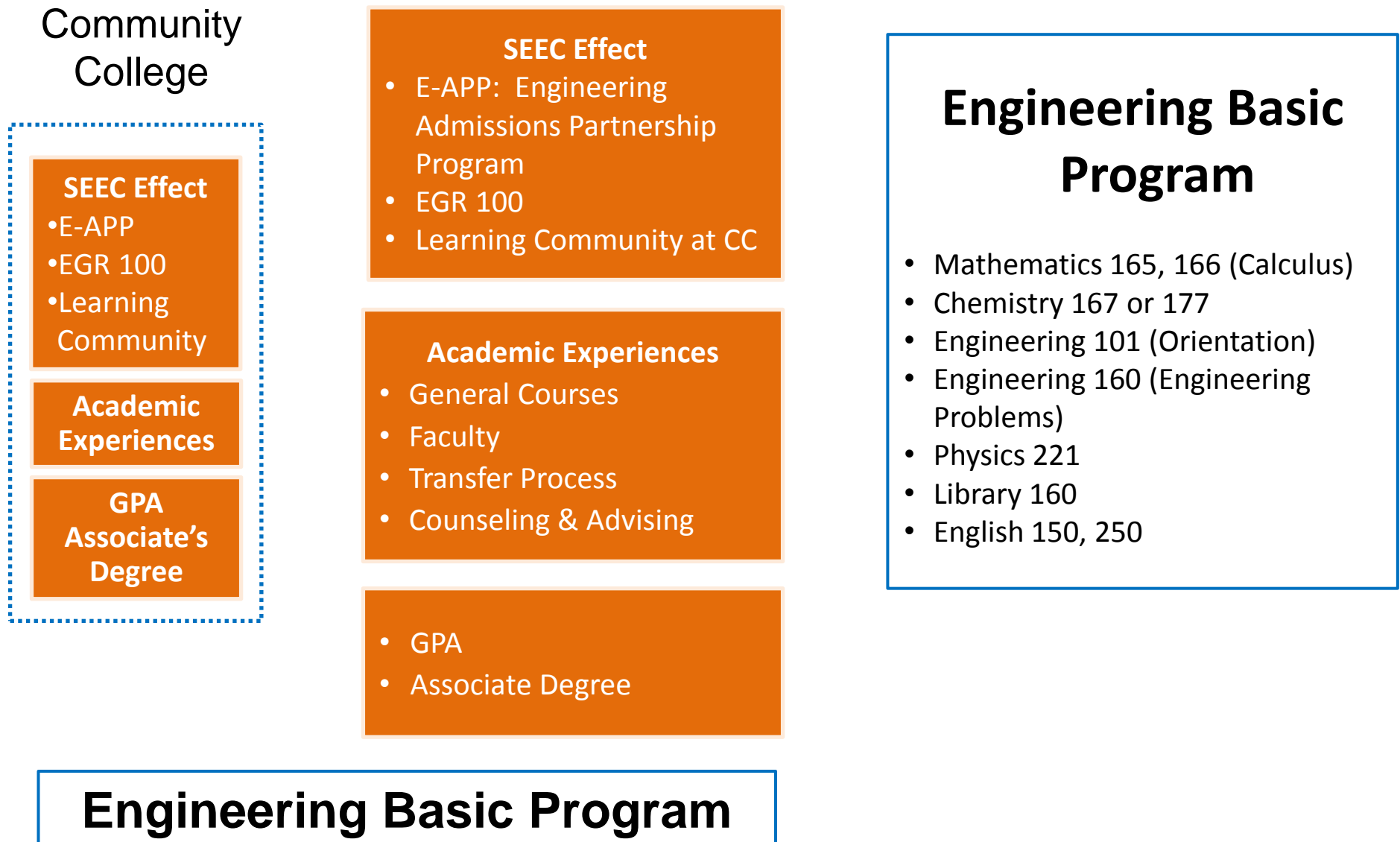


Figure 1. Conceptual Model of SEEC Effect  
Engineering Transfer Student Retention and Success

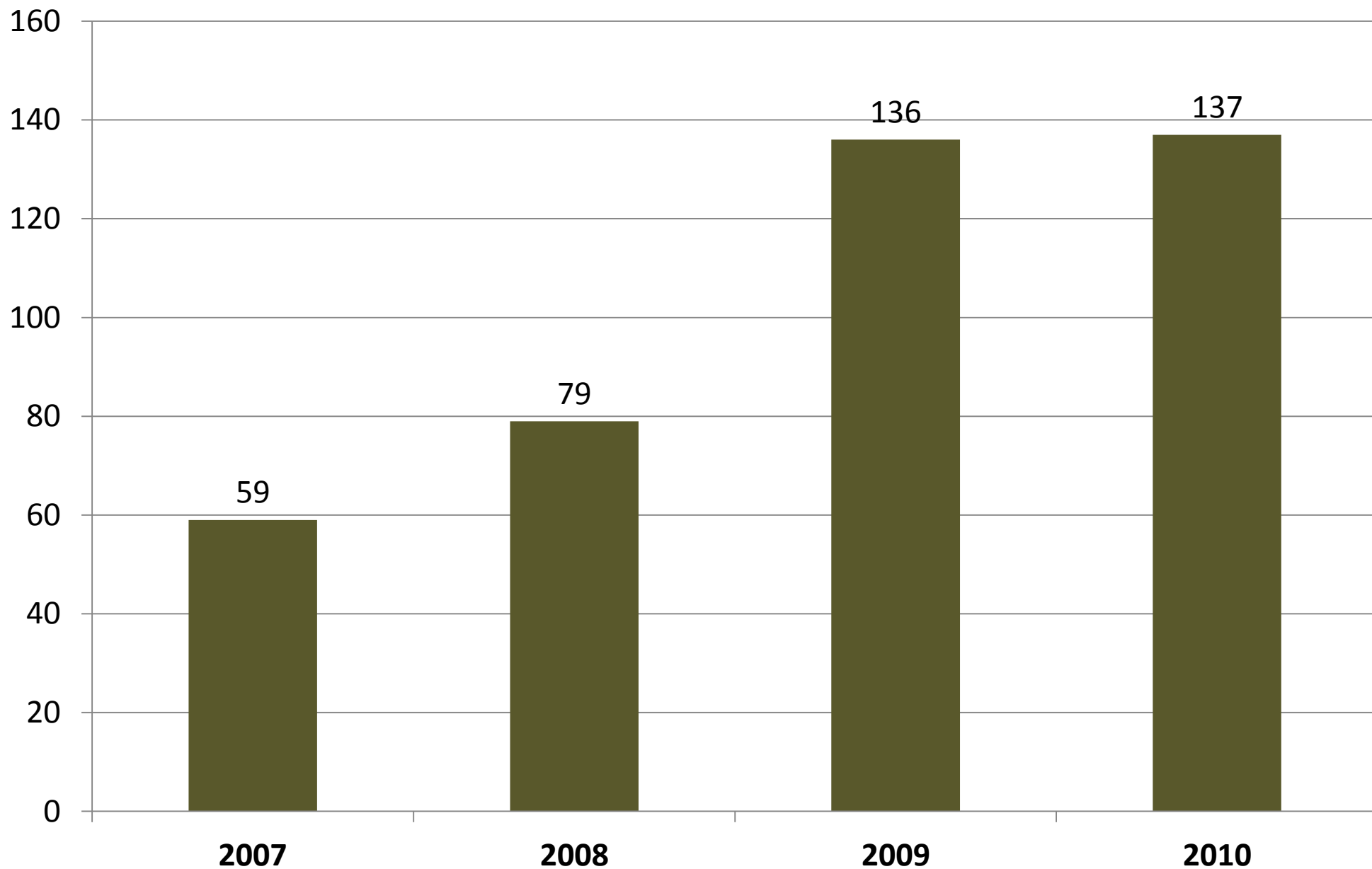


Source: Laanan, F., Rover, D., Bruning, M., Mickelson, S., & Shelley, M. (2011). Iowa State University.

Figure 2. Conceptual Model of SEEC Effect:  
Community College Environment



## CoE E-APP Enrollment



## Enrollment in Des Moines Area Community College (DMACC) EGR 100

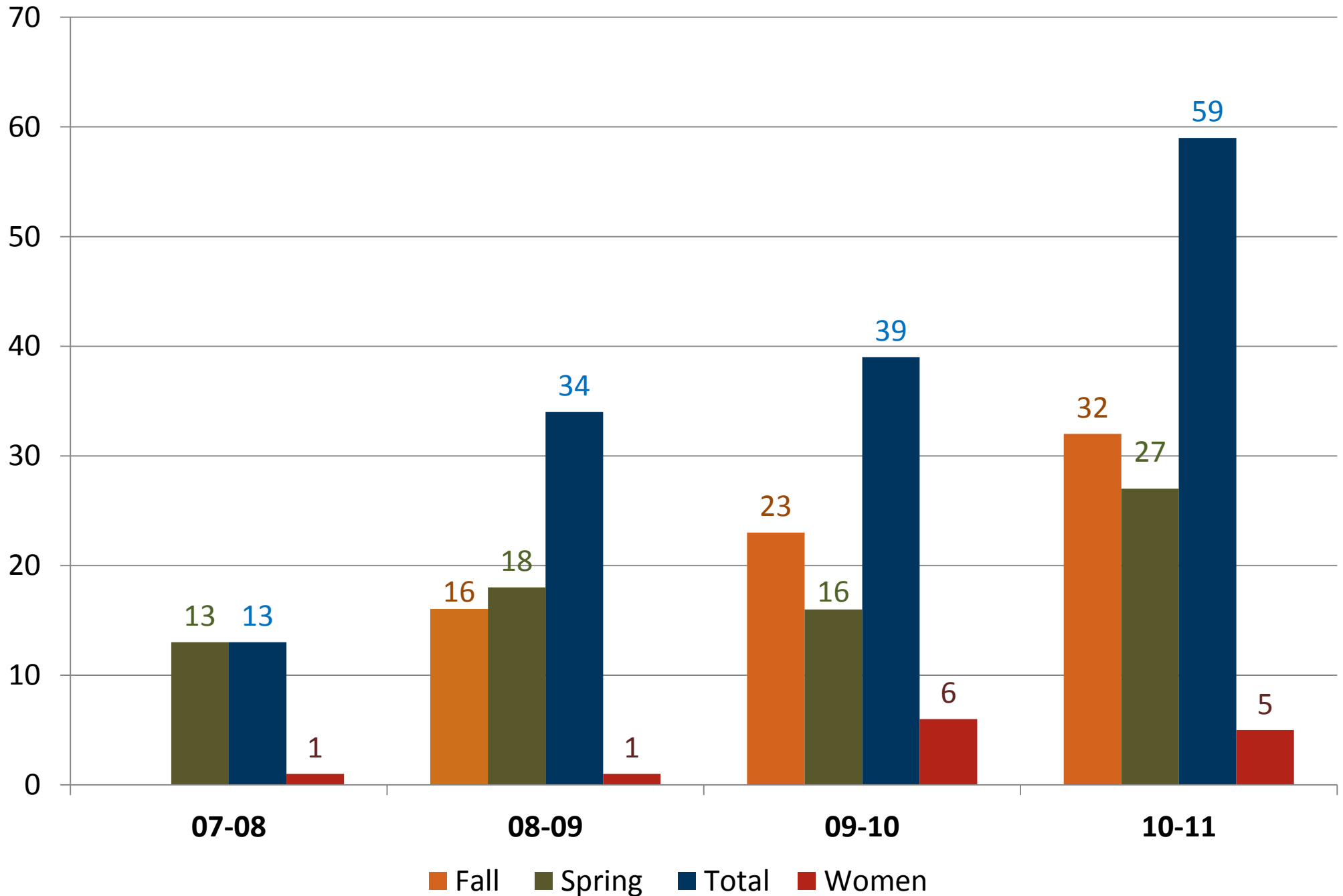
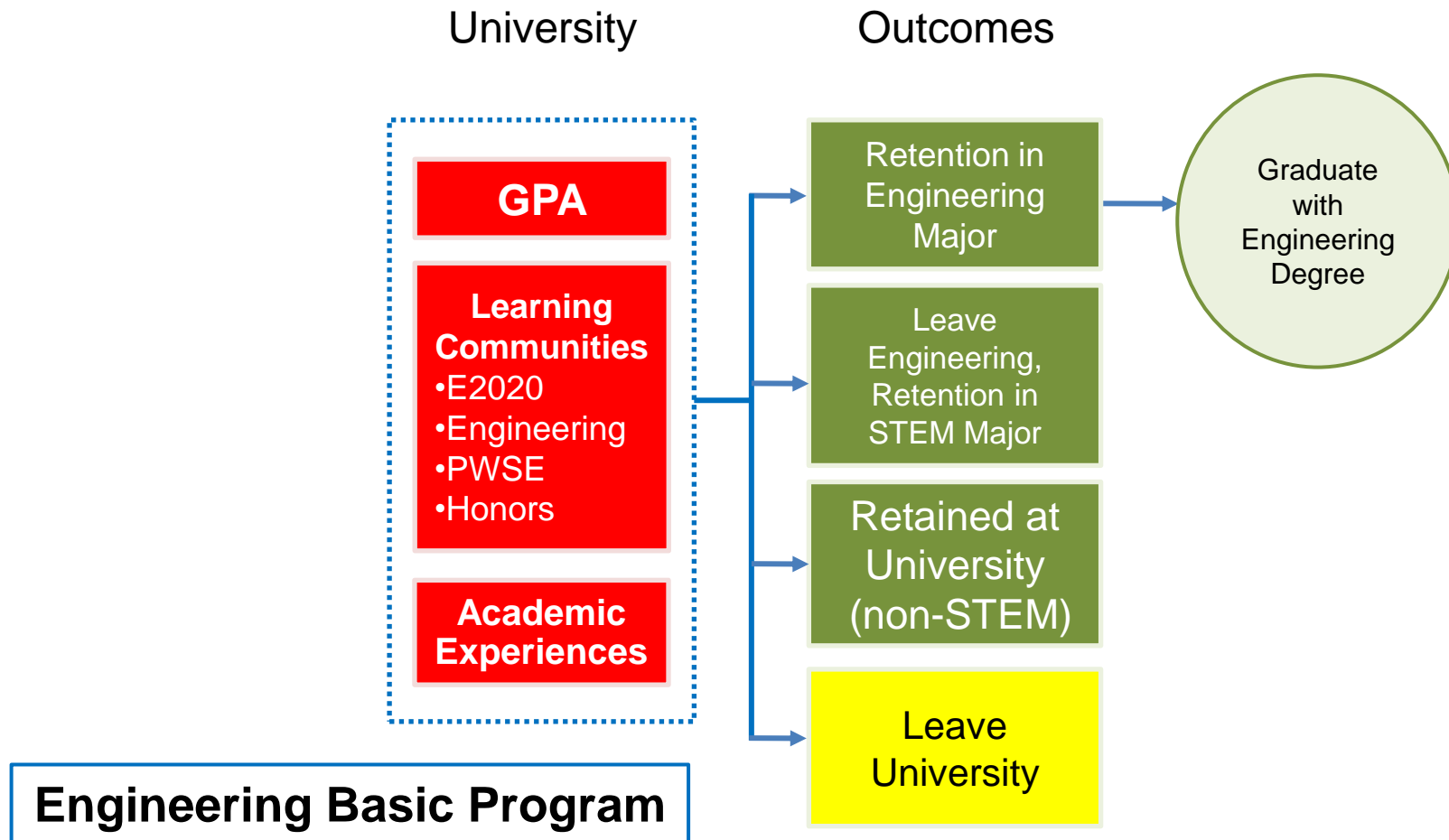
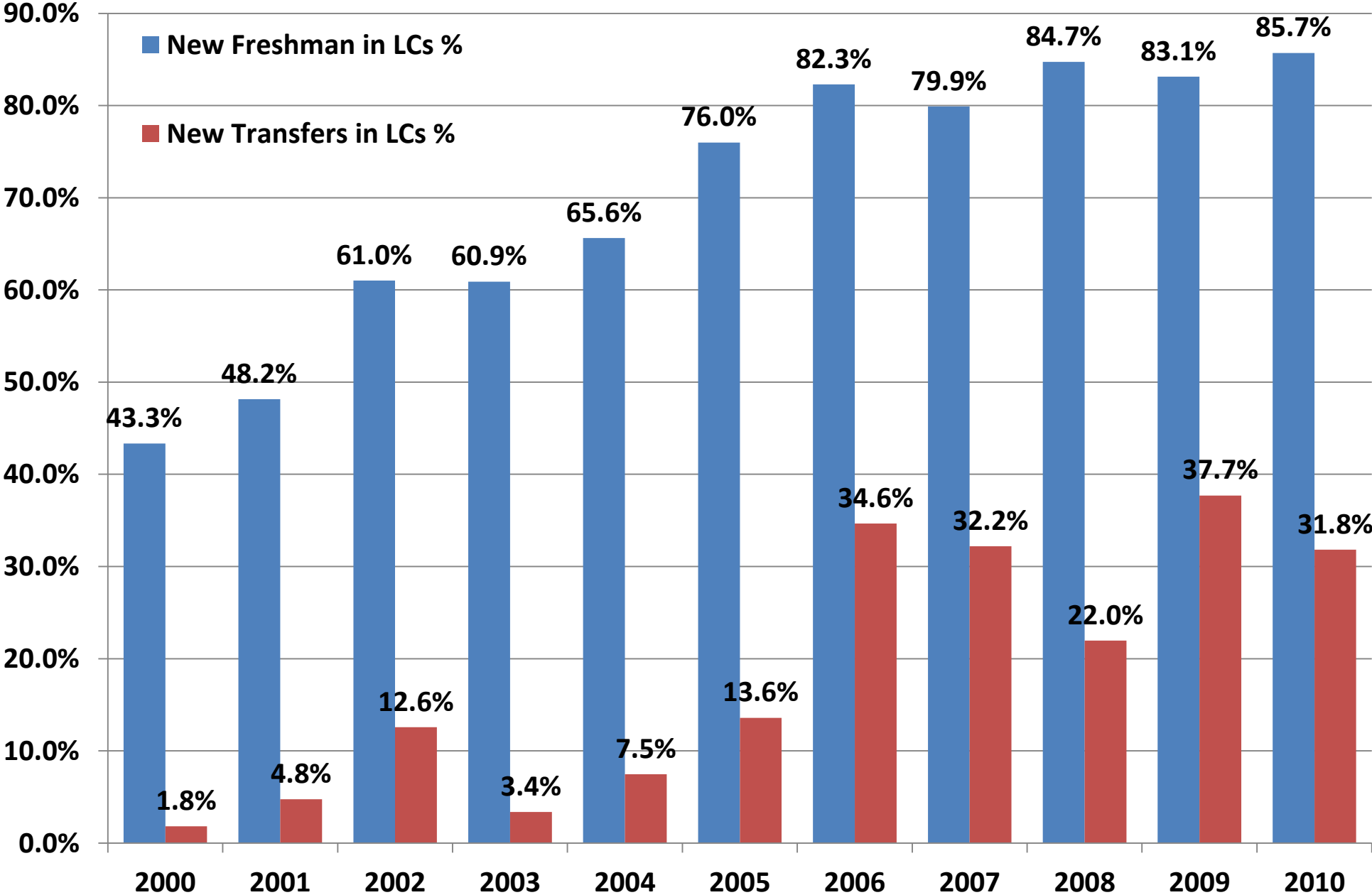




Figure 3. Conceptual Model of SEEC Effect:  
University of Environment



# CoE Learning Community Participation



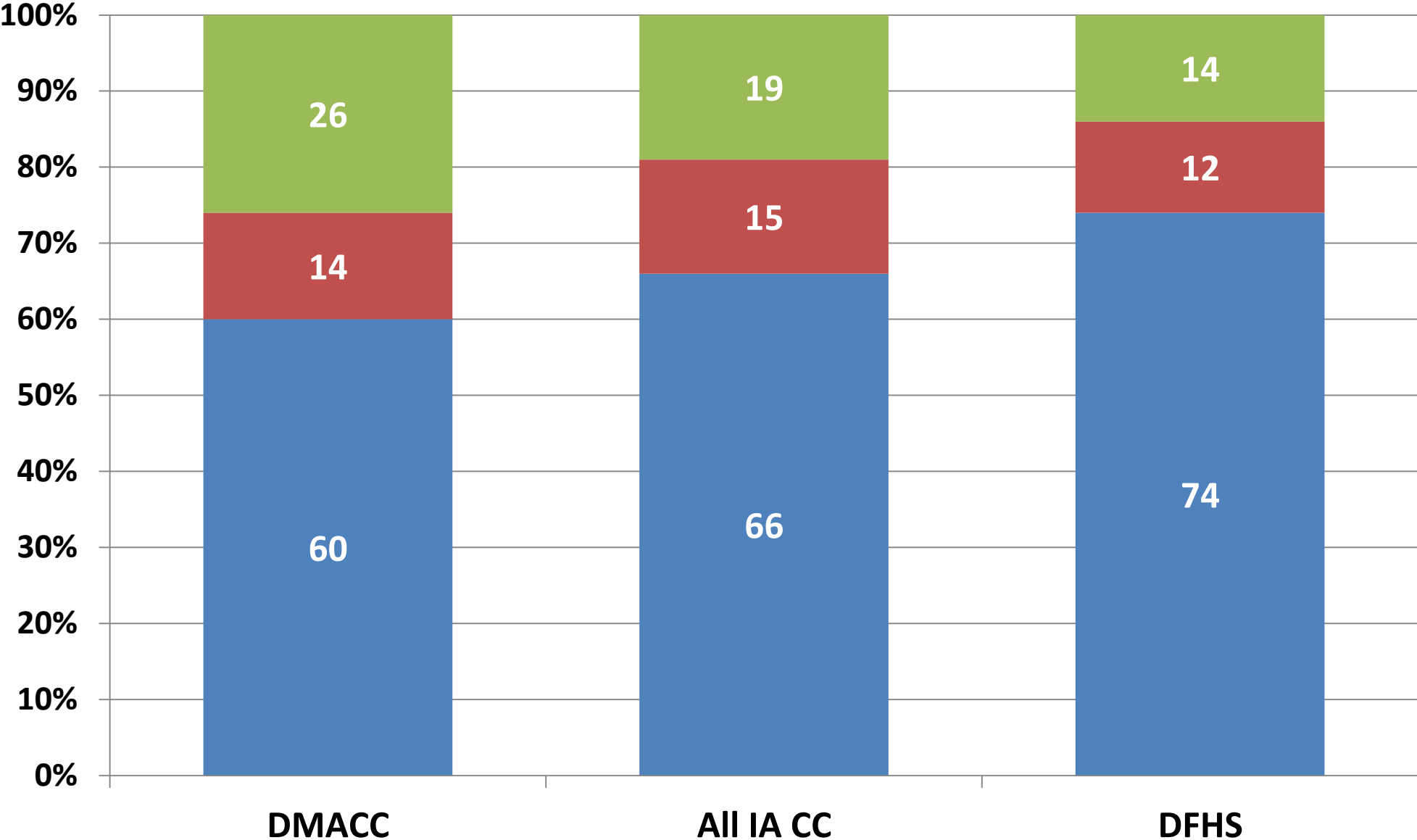
# E-APP and Retention

- E-APP students are retained at significantly higher levels than non-E-APP students.
- E-APP significantly improves retention over Non-E-APP in early studies.
- E-APP is statistically significant for improving retention even when controlling for transfer GPA and basic program GPA.
- This is especially true for DMACC students.

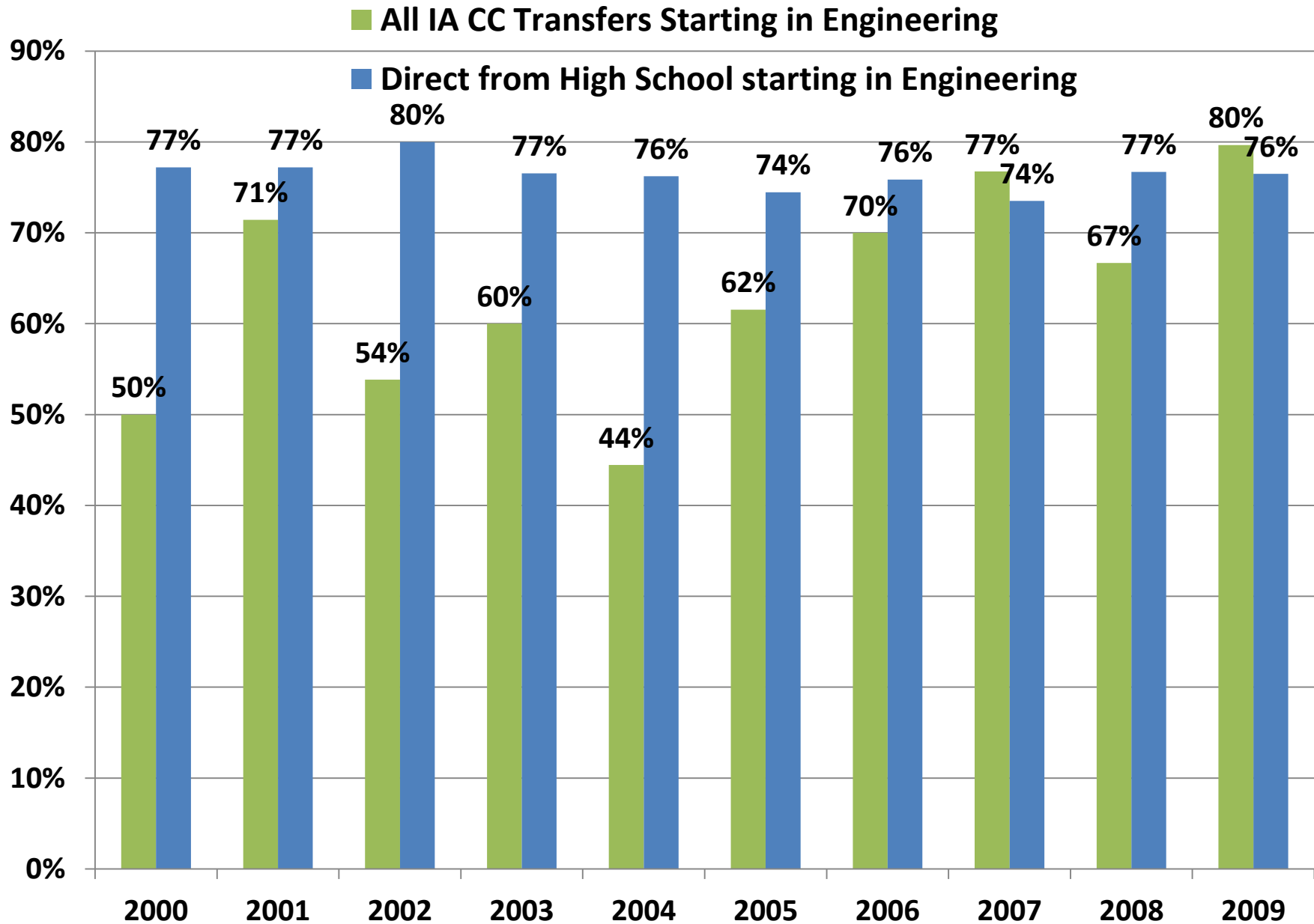
# 10 Year Averages for Retention: One Year

For Each 100 Students that Start in Engineering:  
This Shows Where They are 1 Year Later

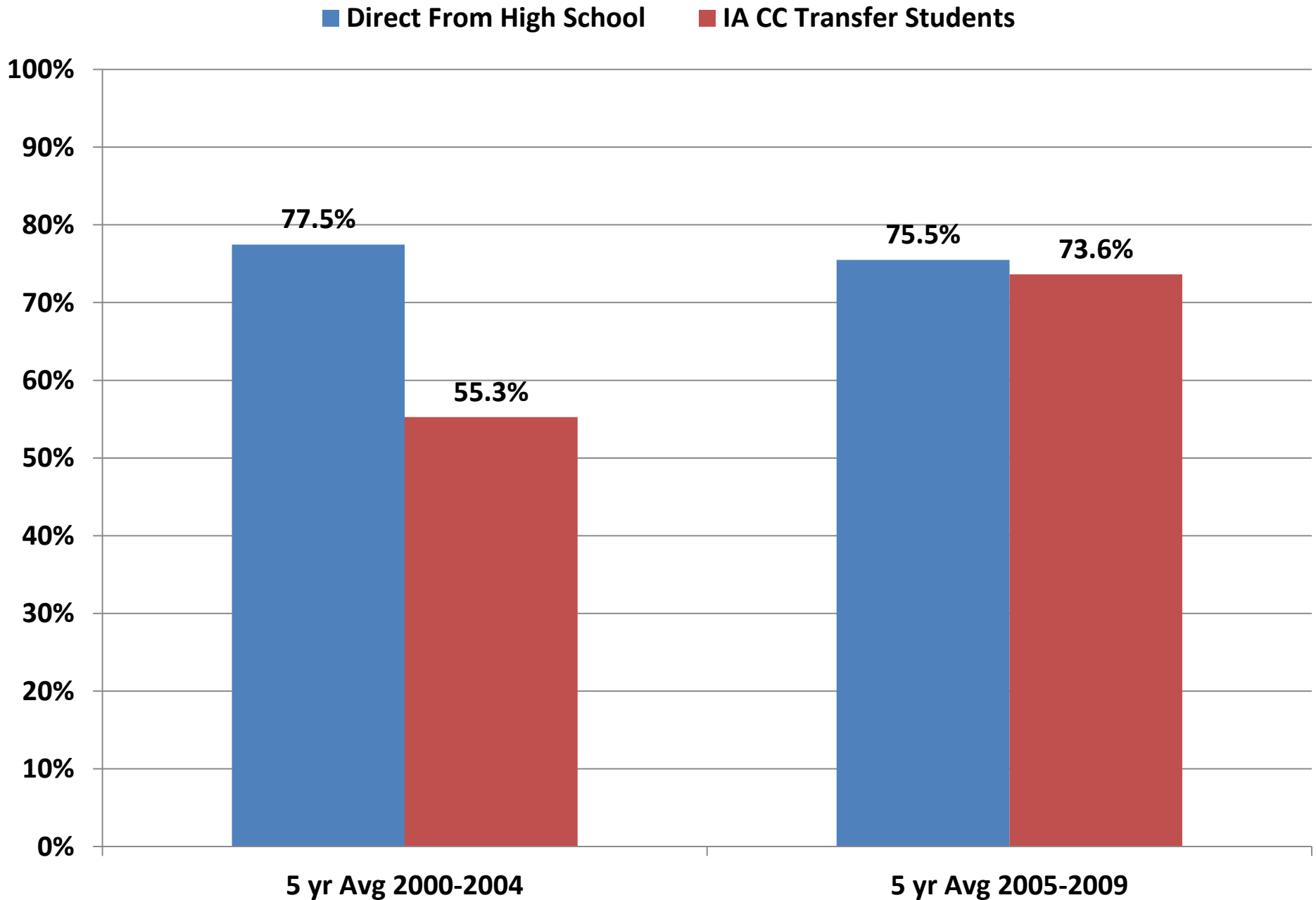
■ Still in Engr ■ Still at ISU ■ Left ISU



# CoE LC One Year Retention Rates in Engr

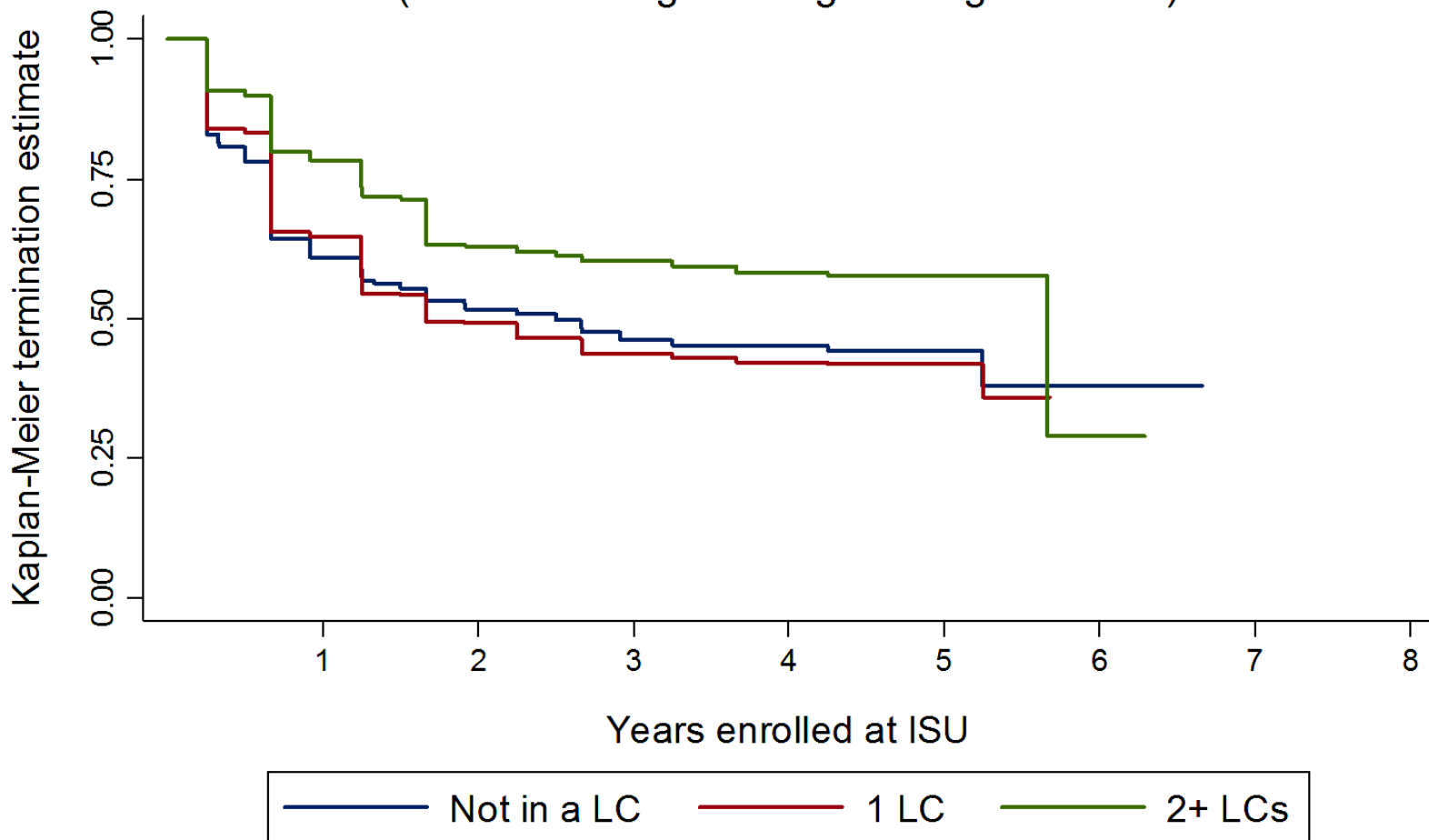


# CoE One Year LC Retention in Engr



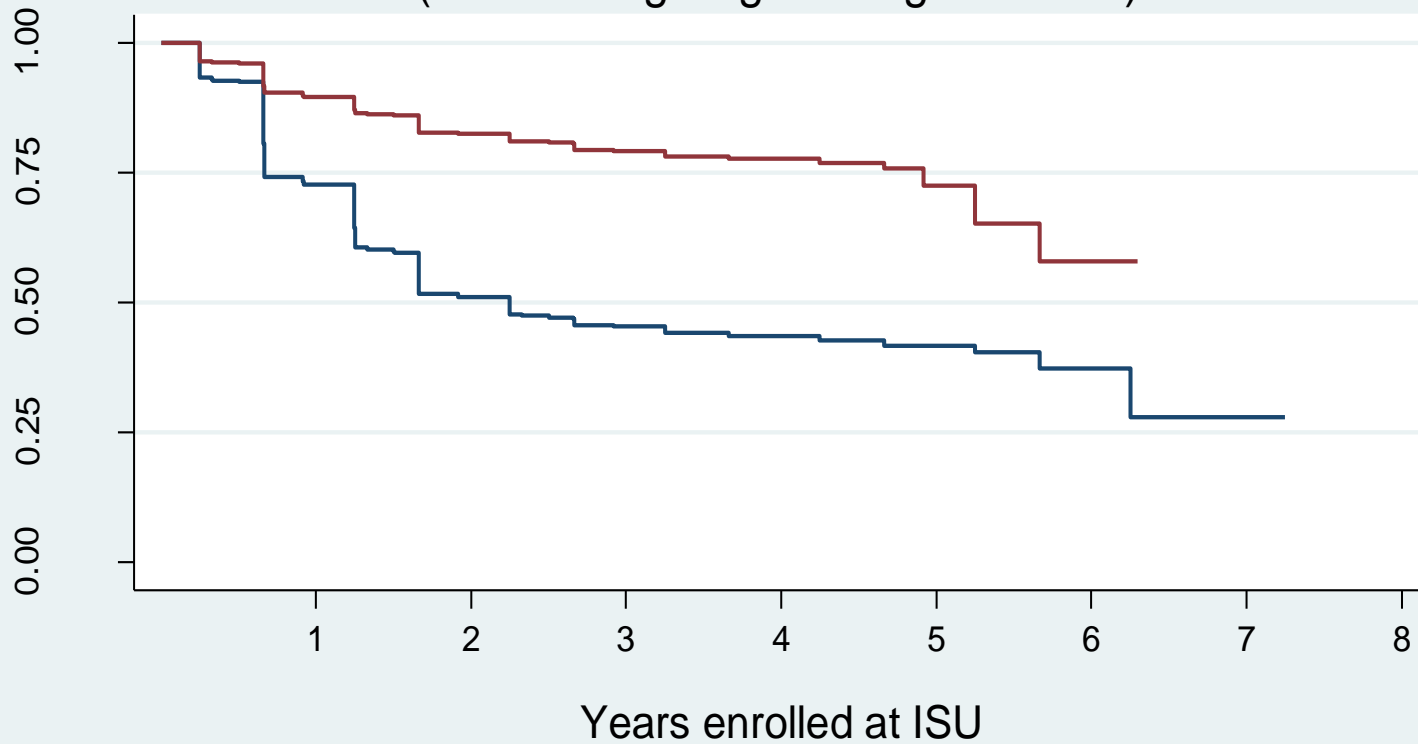
# Multiple-Learning Community Effect on Retention of Women in Engineering

## Impact of LC Participation on COE Retention (Female College of Engineering Students)



Source: 2011 SEEC Grant College of Engineering Retention Analysis

## ENGR 160 Student Retention within COE (All Entering Engineering Students)



Number at risk

engr160hilo = 0	1288	895	736	514	69	8	1	0
engr160hilo = 1	1144	1029	895	545	32	3	0	0

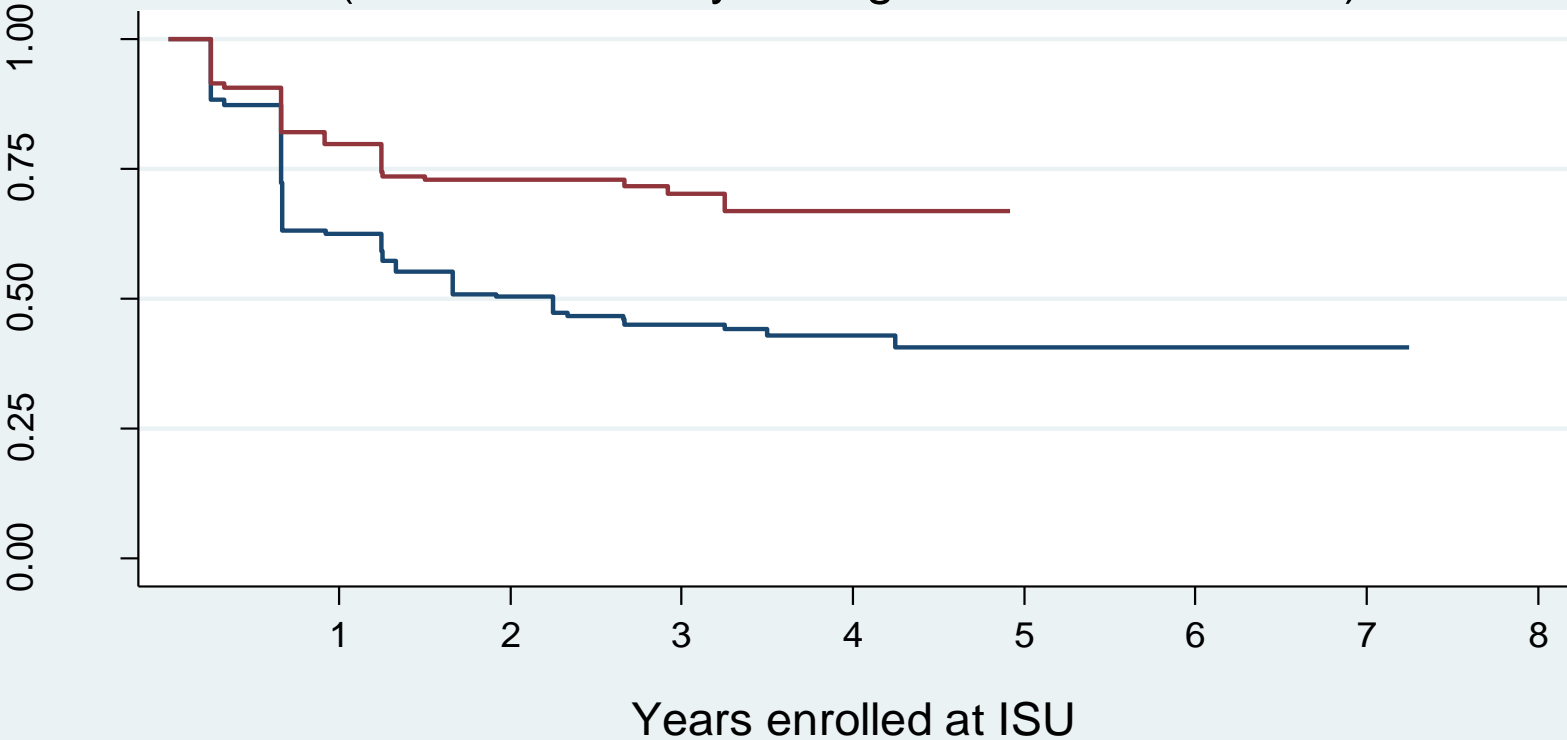
— 0.00 - 3.00 GPA    
 — 3.01 - 4.00 GPA

Source: 2011 College of Engineering Retention Analysis



# ENGR 160 Student Retention within COE

(Iowa Community College Transfer Students)



Number at risk									
enr160hilo = 0	129	99	61	19	5	1	1	0	
enr160hilo = 1	103	88	42	11	0	0	0	0	

— 0.00 - 3.00 GPA     
 — 3.01 - 4.00 GPA

Source: 2011 College of Engineering Retention Analysis

# Future Research

- Utilize Engineering-Transfer Students' Questionnaire (E-TSQ).
- Connect survey with students' academic transcript.
- Identify challenges regarding progression to complete engineering major.
- Explore and understand the experiences of women and URMs.
- Secure larger sample size
- Employ E-TSQ at more universities

# Questions

## Contact information:

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