

Data Collection and Analysis Project—Retention

Marcia Laugerman, Diane Rover, Monica Bruning, Frankie Santos Laanan, Steven Mickelson, Mack Shelley, Mary Darrow, and Jason Pontius

Introduction

The SEEC project research team has begun collecting and analyzing an extensive amount of data pertaining to Iowa State engineering students. The overall goal of this data collection and analysis project is to develop standard reports to help administration make programming decisions at Iowa State University, Des Moines Area Community College (DMACC), and other Iowa community colleges that will foster transfer student success in engineering at Iowa State. Strengthening the pathway to an engineering degree through collaboration and support of transfer will not only increase the number of engineering graduates but also the diversity of these graduates. Community college programs historically have higher representation among underrepresented groups such as female, minority, first-generation, and lower income students. (National Academy of Engineering 2005).

The Project

An initial request to Iowa State University's Institutional Research and Engineering Career Services returned semester by semester transcript data for approximately 13,400 students who were admitted to the College of Engineering from fall of 1999 through fall of 2009. Statistical data includes students' enrollment information and their corresponding retention numbers in one, two, and three year increments from fall 2000 through fall 2010. Retention is measured for those that stayed in the College of Engineering, those that left the College of Engineering but stayed at the university, and for those that left the university.

SEEC project goals include building on the success of learning communities in recruiting and retaining engineering students. Therefore, the data also includes this information as it pertains specifically to those enrolled in an Iowa State Learning Community.

The data was separated by admit status to the University to enable first-ever tracking of students by their pathway to engineering. Admit status included two groups:

- Those entering the College of Engineering directly from high school (DFHS)
- Those transferring to the College of Engineering from all schools (Transfers)

A student is considered direct from high school if they enter Iowa State in the semester that follows their high school graduation. This designation includes those who bring credits for dual enrolled or advanced placement courses.

A transfer student is defined by the timing of their college credits rather than the number of college credits earned. A student is considered a transfer student if the credits earned were after high school graduation.

Disaggregating transfer student data presents a number of unique challenges since it has not been done before. One limitation of the data for this study is that the transfer institution listed is where they attended most recently and may not be the school where the student had the most transfer credit. It is not unusual for a transfer student to bring credit from multiple institutions. Additionally, the study did not consider students who left the College of Engineering and later returned or those students who started in another Iowa State college and transferred to engineering. Future studies will address these challenges.

Transfer students were further separated by those transferring from Iowa Community Colleges (IA CC).

Data was separated this way to measure the SEEC effect on community colleges in Iowa. In order to determine if SEEC interventions are improving retention rates of Iowa

community college transfers we benchmark against both direct from high school and all transfer students.

Table 1
Average Engineering Retention Rates

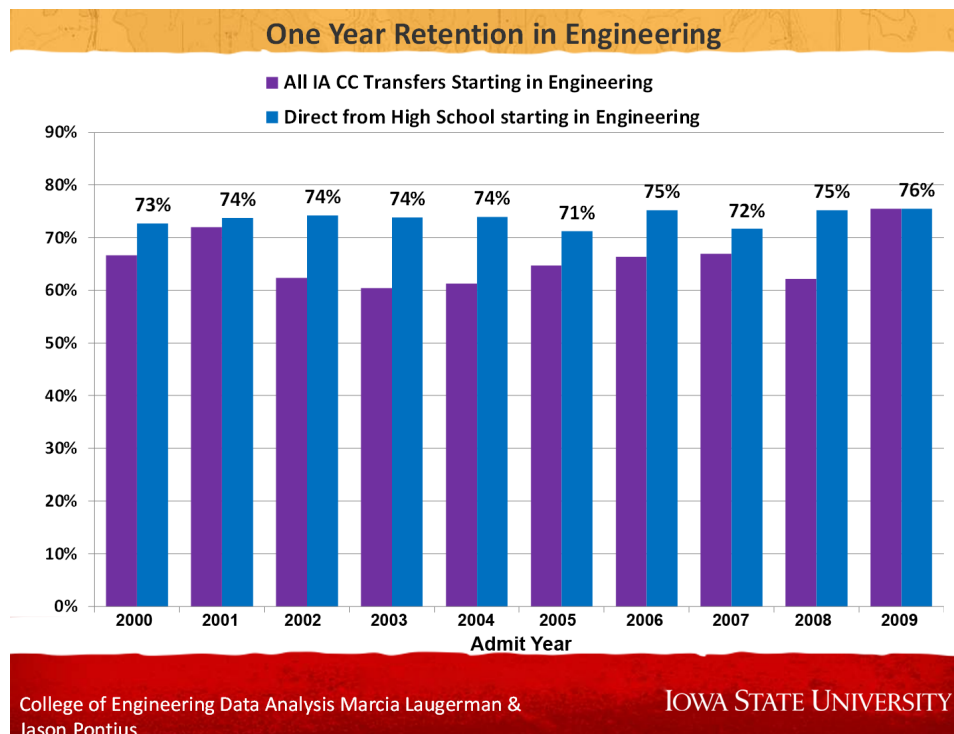
Period	Grouped By:	Admit Type		
		Direct from High School (DFHS)	All Transfers	IA CC Transfers
One Year	All Engineers	73.8%	69.7%	66.0%
	Engineers in a LC	76.3%	70.8%	70.5%
Two Year	All Engineers	60.4%	57.8%	54.9%
	Engineers in a LC	63.0%	59.7%	55.0%
Three Year	All Engineers	55.2%	41.5%	44.4%
	Engineers in a LC	58.0%	51.2%	47.1%

Admitted to the College of Engineering during Summer and Fall Semesters 1999-2009

Measured as enrolled in engineering as of Fall Semester for the Years 2000-2010

In Table 1, when engineering students were in a learning community (LC), their retention was higher for both direct from high school (DFHS), all transfers, and all Iowa community college (CC) transfers.

Figure 1



The annual trends for one-year retention rates (Figure 1) for all Iowa community colleges show a stable retention trend with a large increase in the most recent year. This trend may have been influenced positively by SEEC efforts

since 2006, especially if this rate can be sustained. The retention rates for DFHS admits are relatively constant over this ten-year period.

Retention averages (Figures 2, 3, 4 and 5) for this period clearly show that retention of community college students was considerably lower than retention of students entering direct from high school. Note that

students from Iowa community colleges were less likely than DFHS students to remain at the university if they were not retained in engineering.

Figure 2

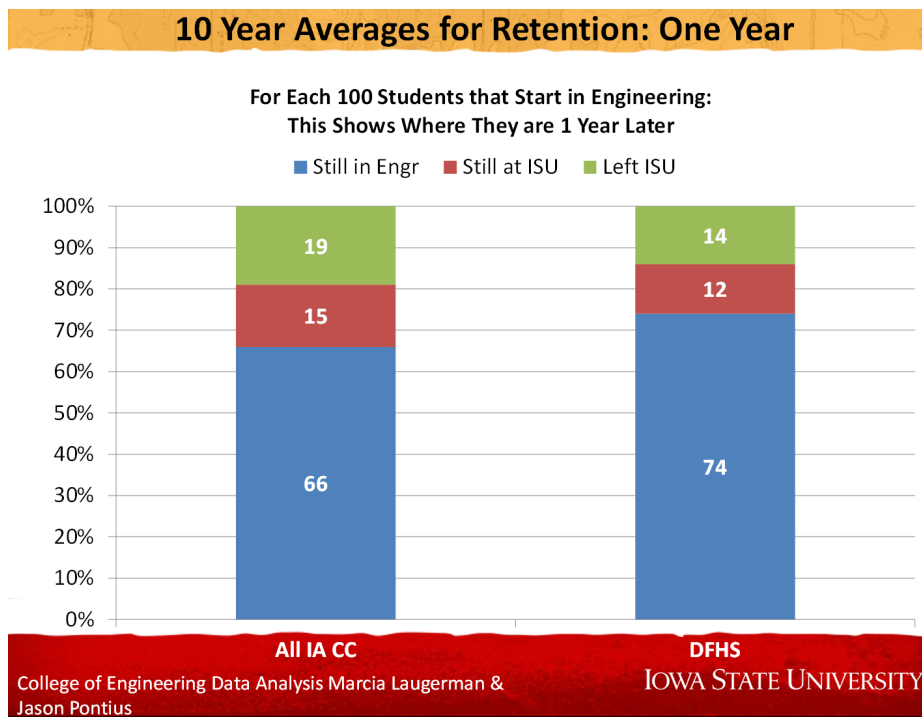


Figure 3

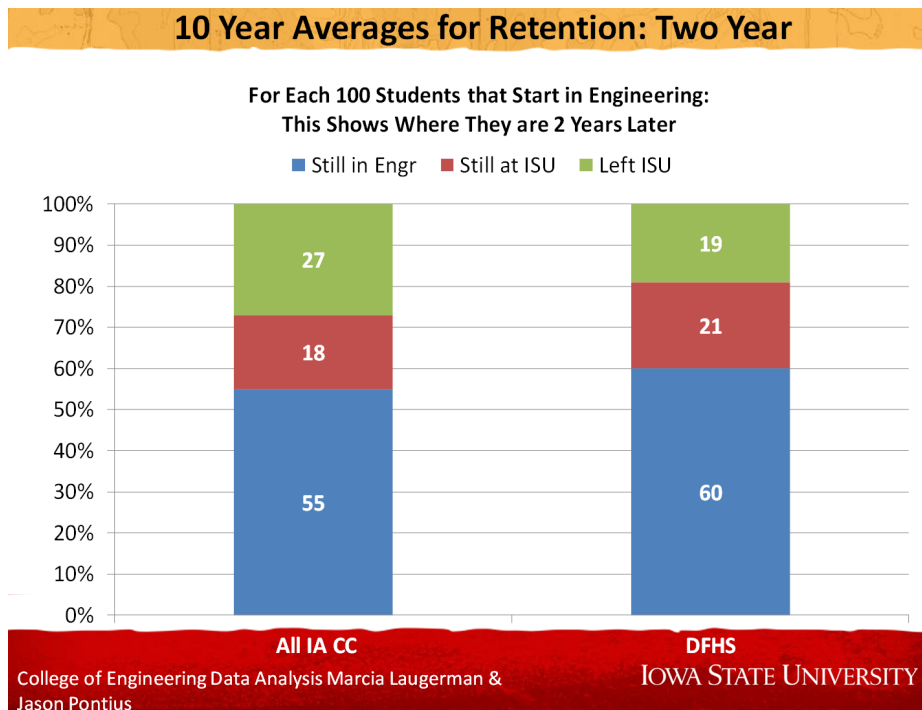


Figure 4

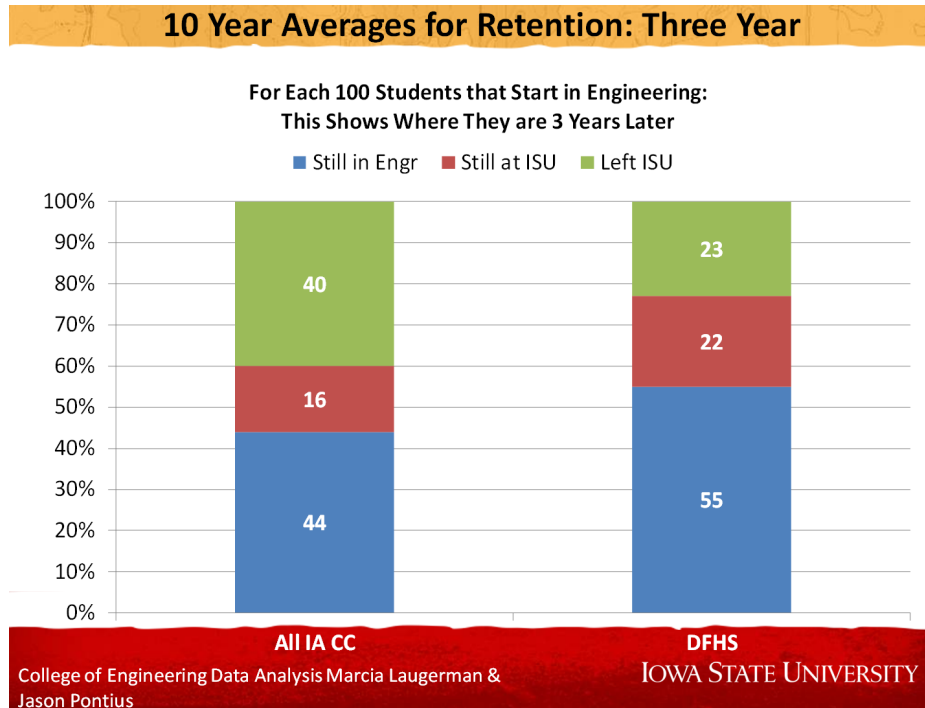
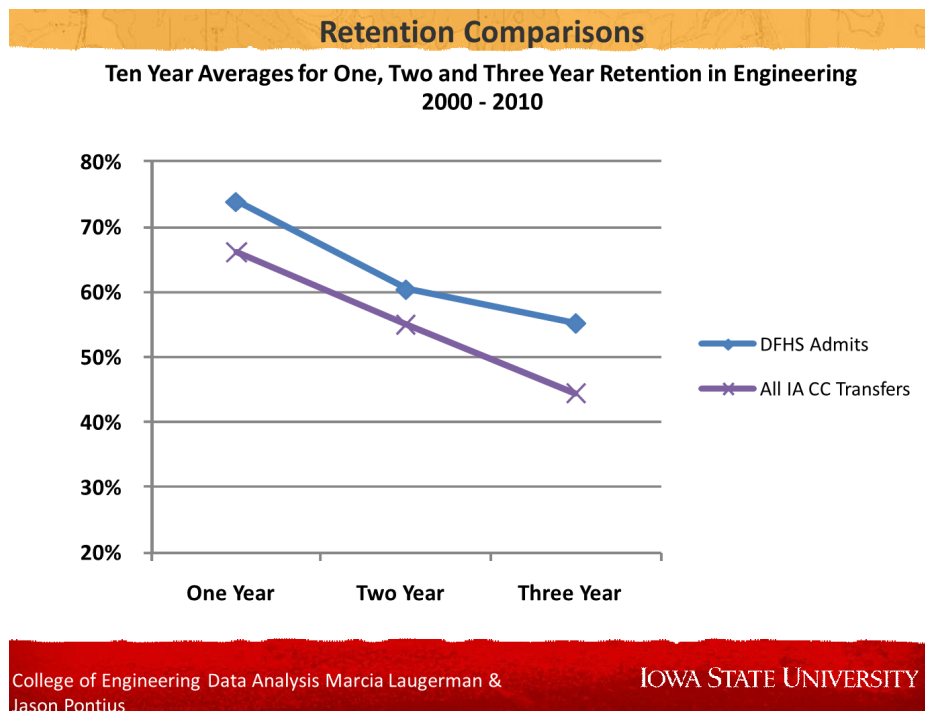


Figure 5



Conclusion

The general retention trends of Iowa community college students entering engineering compared to direct from high school students indicate that these segments are less likely to remain in engineering at Iowa State. However, data comparing those who participated in a learning community with those who did not indicates that being part of a learning community increases retention. Learning communities are part of a collaborative, connection-based strategy to increase retention among all segments, with an emphasis on community college students, and is part of the overall strategy of the SEEC project. This topic is explored further in *SEEC Data Brief: How Learning Communities Affect Retention*.

About the SEEC project

The Student Enrollment and Engagement through Connections (SEEC) project is a collaboration between Iowa State University and Des Moines Area Community College (DMACC) funded by the National Science Foundation's STEM Talent Expansion Program. The goal of the project is to increase the number of engineering graduates at Iowa State University by approximately 100 per year. The percentage of women and minority graduates will approach 20% and 10%, respectively.

References

Mattis, M.C. & Sislin, J. (2005). Enhancing the Community College Pathway to Engineering Careers. National Academy of Engineering, National Research Co.

Additional Resources

SEEC (www.eng.iastate.edu/seec)

Pathway2STEM Degree (www.pathway2stemdegree.org)

SEEC TEAM

Principal Investigators

Diane Rover

Professor, Electrical and Computer Engineering
Iowa State University
Email: drover@iastate.edu

Harry McMaken

Professor, Engineering and Math
Des Moines Area
Community College
Email: hlmcmaken@dmacc.edu

Co-Principal Investigators

Monica Bruning

Senior Research Associate
and Lecturer, Educational Leadership
and Policy Studies
Iowa State University
Email: mbruning@iastate.edu

Frankie Santos Laanan

Interim Director, Center for
Excellence in Science, Mathematics
and Engineering Education
Associate Professor, Educational
Leadership and Policy Studies
Iowa State University
Email: laanan@iastate.edu

Steven Mickelson

Professor and Chair, Agricultural and
Biosystems Engineering
Iowa State University
Email: estaben@iastate.edu

Mack C. Shelley

University Professor
Political Science and Statistics
Iowa State University
Email: mshelley@iastate.edu

Senior Personnel

Mary Darrow

Transfer and E-APP Coordinator
College of Engineering
Iowa State University

Andrew Ryder

Research and Evaluation Scientist
Research Institute for Studies
in Education (RISE)
Iowa State University

Karen Zunkel

Program Manager
Program for Women in Science and
Engineering
Iowa State University

Other Personnel

Virginia Anderson

Information Assurance Center
Electrical and Computer Engineering
Iowa State University

Sandy Jennings-Hammond

Communications Consultant
Iowa State University

Other Executive Team Members

Joel Johnson

Program Manager
Engineering Academic/
Student Affairs
Iowa State University

Marcia Laugerman

Graduate Assistant-Research
Agricultural and Biosystems
Engineering
Iowa State University

Carlos Lopez

Graduate Assistant-Research
Educational Leadership
and Policy Studies
Iowa State University

<http://www.eng.iastate.edu/seec>



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Diane Rover, Principal Investigator

Electrical and Computer Engineering
333 Durham Hall
Iowa State University
Ames, IA 50011
Office: 515.294.2819
E-mail: drover@iastate.edu
www.engineering.iastate.edu/~drover/

Frankie Santos Laanan, Co-PI and Director

Office of Community College Research and Policy
Educational Leadership & Policy Studies
Iowa State University
N243 Lagomarcino Hall
Ames, IA 50011
Office: 515.294.7292
E-mail: laanan@iastate.edu
www.cclp.hs.iastate.edu/occrp/

Collaboration between

IOWA STATE UNIVERSITY

DMACC
DES MOINES AREA
COMMUNITY COLLEGE