Tippie College of Business
The University of Iowa

Women in BAIS

Creating an Environment of Inclusion and Support

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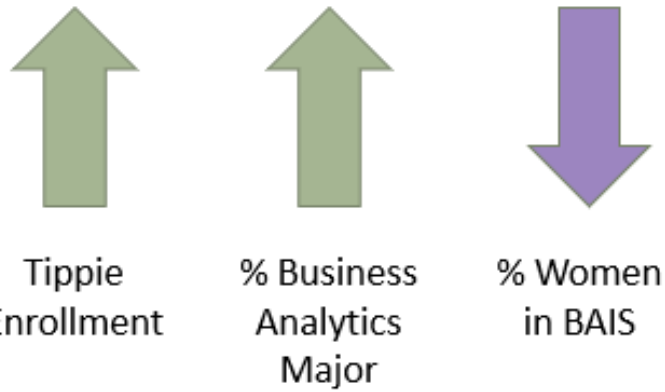
The Journey

FOCUS

Target of research project



Purpose

Background

- Over the past 5 years, the percentage of women majoring in Business Analytics and Information Systems (BAIS) at the TCOB has been steady, at around 40%. Recently, the total number of students majoring in BAIS is increasing, but the percentage of women is decreasing.
- This project is focused on using TCOB data, Tippie female-focused student survey data, research, and external data to understand how to better support and encourage women to pursue a BAIS degree.

Why is gender diversity important?

- Gender diversity brings a balance of cooperation and understanding between students.
- Generally men and women approach problems differently. These different perspective bring growth in learning.
- Companies recruiting TCOB graduates are interested in a diverse set of talent. More women could result in better recruiting at Iowa.

Focus - Areas

Scope

- Focus on women with undeclared major
- High school through 2nd year UI student
- Current Business Direct Admission or Business Standard Admission status

Goal

- Provide top 3 recommendations
- Give guidance for State Farm Grant
- Create guide for department innovations and differentiators

APPROACH

Pulling together data and research

Approach

Evaluate TCOB Enrollment Data

- Enrollment trends across the college
- Major enrollment by gender
- Direct Admit enrollment
- Fall 2013 – Fall 2018 data

Survey Tippie Female Students

- Discover how women perceive BAIS
- Explore factors that influence their decisions
- Understand why women choose BAIS
- Recognize how women want to be supported

Research Women in STEM* and Factors of Influence

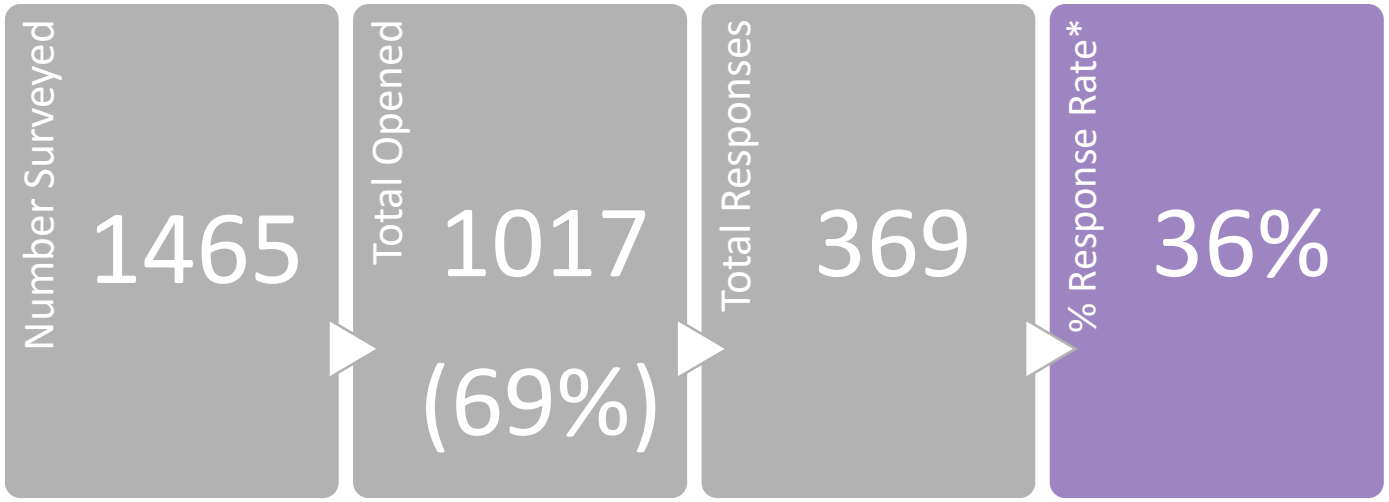
- Social inclusion
- Underrepresentation in STEM - focus on MIS, IS and Computer Science articles
- Stereotyping
- Gender bias

*Note: Minimal research found on women in analytics and information systems, therefore focus on Women in STEM and Computer Science articles.

FINDINGS

Create meaning from data and research

Tippie Women's Survey – Response Rate



* % response rate calculated using total responses/total opened.

- Survey sent via email
- All undergraduate women with a tie to Tippie sent survey
- Ran for 2 weeks from 1/22/19 – 2/1/19
- Declared and Undeclared students identified

Tippie Women's Survey - Who Responded?

57% Declared Major (210)

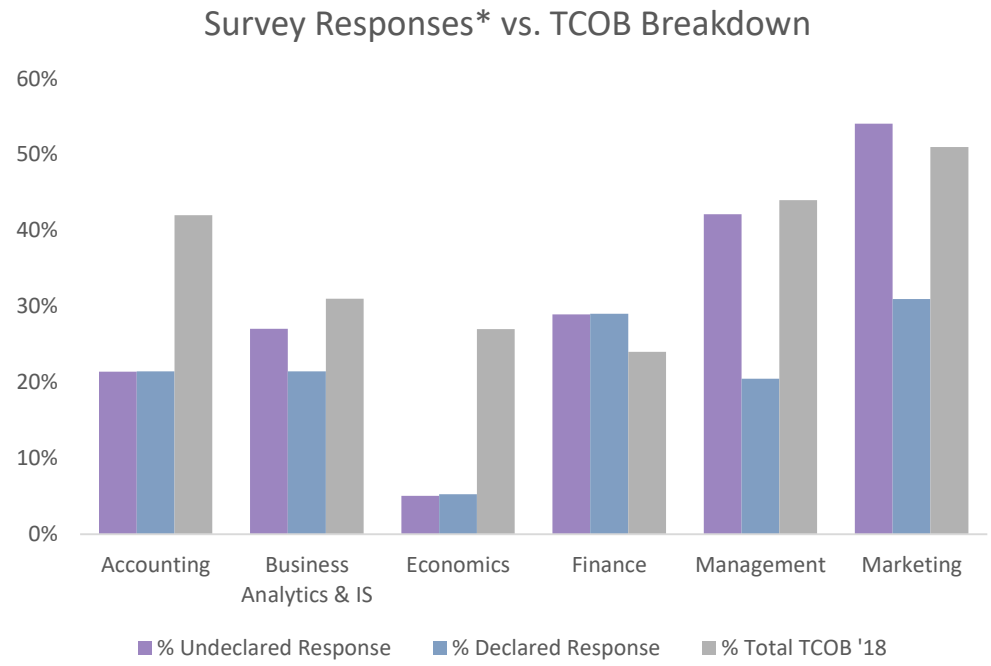
43% Undeclared Major (159)

21% Declared - BAIS (45)

27% Undeclared BAIS (43)

Response from BAIS Women 10% lower than TCOB BAIS enrollment

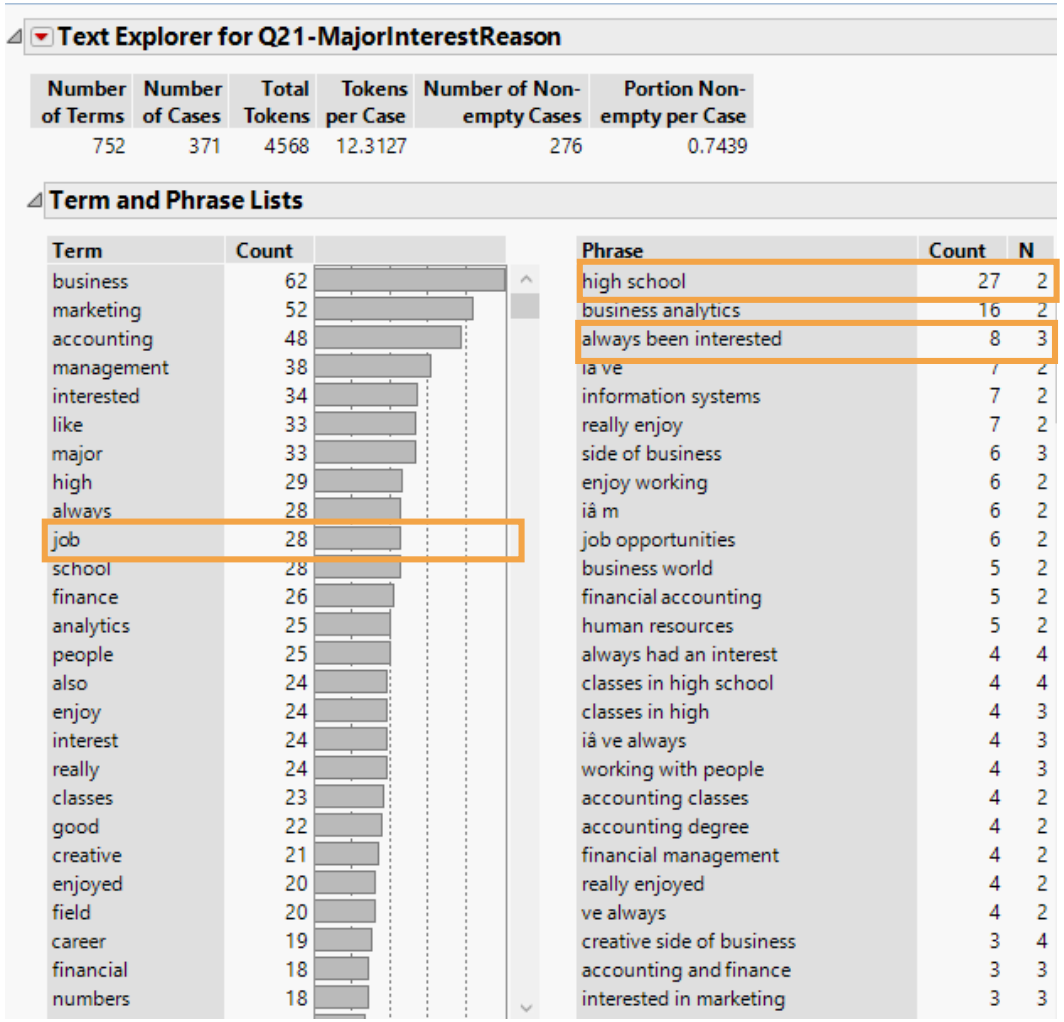
Interest in BAIS by undeclared slightly lower than TCOB BAIS enrollment



*Women may be counted more than once for each category based on multiple majors or multiple major interest areas

Reason for Interest in Major

- High school courses significant influence
- Exposure to jobs (family, high school work, or internships)
- Previous exposure translate to interests



Text Explorer for Q21-MajorInterestReason

Number of Terms	Number of Cases	Total Tokens	Tokens per Case	Number of Non-empty Cases	Portion Non-empty per Case
752	371	4568	12.3127	276	0.7439

Term and Phrase Lists

Term	Count
business	62
marketing	52
accounting	48
management	38
interested	34
like	33
major	33
high	29
always	28
job	28
school	28
finance	26
analytics	25
people	25
also	24
enjoy	24
interest	24
really	24
classes	23
good	22
creative	21
enjoyed	20
field	20
career	19
financial	18
numbers	18

Phrase	Count	N
high school	27	2
business analytics	16	2
always been interested	8	3
ia ve	7	2
information systems	7	2
really enjoy	7	2
side of business	6	3
enjoy working	6	2
iâ m	6	2
job opportunities	6	2
business world	5	2
financial accounting	5	2
human resources	5	2
always had an interest	4	4
classes in high school	4	4
classes in high	4	3
iâ ve always	4	3
working with people	4	3
accounting classes	4	2
accounting degree	4	2
financial management	4	2
really enjoyed	4	2
ve always	4	2
creative side of business	3	4
accounting and finance	3	3
interested in marketing	3	3

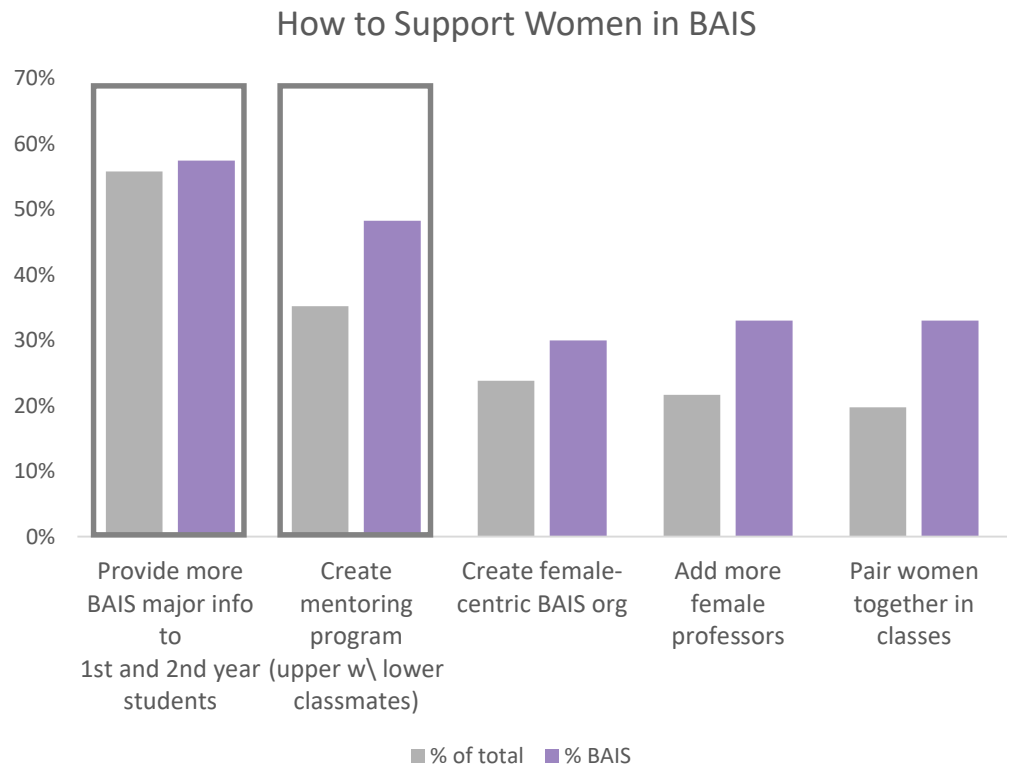
Tippie Women's Survey - Results

44 Interested in Student Organization

41 Interested in Focus Group

56% Want more info about the major in 1st and 2nd year

48% BAIS Women want a mentorship program



BAIS - What Comes to Mind?

Text Explorer for Q7-BAISComestoMind

Number of Terms	Number of Cases	Total Tokens	Tokens per Case	Number of Non-empty Cases	Portion Non-empty per Case
419	371	1755	4.73046	275	0.7412

Term and Phrase Lists

Term	Count
data	119
computers	76
technology	41
numbers	35
excel	31
math	29
business	26
statistics	25
coding	24
think	19
analysis	17
analyzing	16
computer	16
analytics	15
big	15
access	14
information	14
programming	14
class	13
hard	13
software	11
systems	10
difficult	9
boring	8

Phrase	Count	N
big data	15	2
data computers	9	2
business analytics	8	2
technology data	8	2
computer science	6	2
excel access	6	2
information systems	6	2
computers coding	5	2
computers data	5	2
computers software	5	2
data analysis	5	2
data to make	4	3
analyzing data	4	2
data analytics	4	2
data excel	4	2
problem solving	4	2
lot of work	3	3
business decisions	3	2
coding data	3	2
computer programming	3	2
computers databases	3	2
data entry	3	2
data mining	3	2
data numbers	3	2

Text Explorer for Q7-BAISComestoMind Q4-DeclaredMajorYN=Yes, Q16-DeclaredBA+IS=1, Q6-UD-BA+IS=.

Number of Terms	Number of Cases	Total Tokens	Tokens per Case	Number of Non-empty Cases	Portion Non-empty per Case
93	43	203	4.72093	34	0.7907

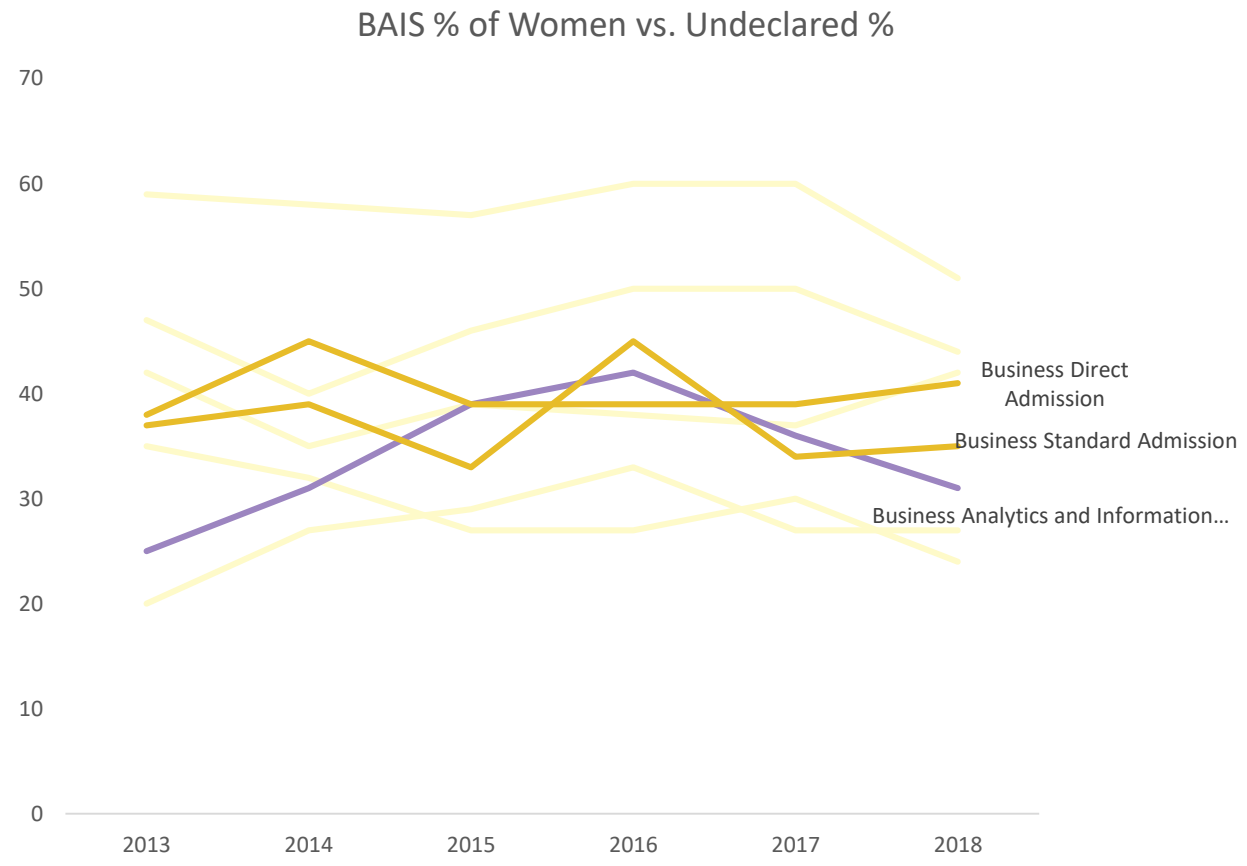
Term and Phrase Lists

Term	Count
data	23
technology	10
coding	9
big	5
decisions	5
tech	4
analysis	3
analytics	3
computers	3
make	3
programming	3
software	3
access	2
analysts	2
analyzing	2
complex	2
cutting	2
demand	2
edge	2
efficiency	2
excel	2
exciting	2

Phrase	Count	N
big data	5	2
data to make	3	3
data analytics	3	2
data to make decisions	2	4
computer science	2	2
computers software	2	2
cutting edge	2	2
data coding	2	2
make decisions	2	2
problem solving	2	2
technology data	2	2

BAIS Declared Women Compared to Undeclared

(Tippie Enrollment Data)



From 2013 – 2018, Tippie admitted an average of 39% women

Are Women Leaving?

NO

- Only 3 female students left BAIS
- 1% of respondents (ncnt = 210 declared)

"I thought marketing sounded like a better fit for my personality."

"Did not have time to graduate with degree due to lack of awareness for the degree -- the major was not heavily promoted until my Junior year."

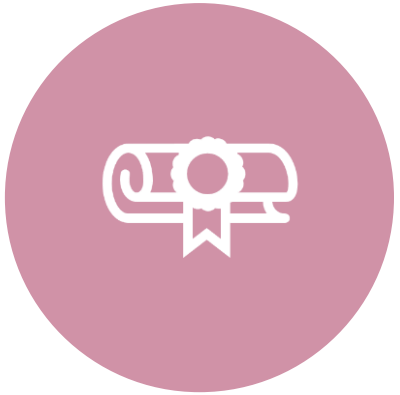
UNDERSTANDING

Converting data into ideas

Understanding – 3 Focus Areas

IMAGE

COMMUNITY



EDUCATIONAL INFLUENCES

Image

- "Providing students with a thorough understanding of the MIS major and the different career options that are available to MIS professionals, and helping them understand the differences between MIS and more technical IT fields would be influential in changing the barriers perceived by students." (Akbulut, 2017)
- "…participants expressed a yearning to contribute to the collective well being of society using their computing skills." (Carrigan, 2017)
- "…interdisciplinary studies advance the theory that social purpose is an important factor to consider in working toward gender equality…" (Carrigan, 2017)

- Need more information
- Greater good and\or social purpose
- More than just technical perception

Community

- “One of the most effective interventions to help young women choose and sustain a STEM educational path and subsequent STEM career is mentoring.” (NSF, 2007)
- “College is when individual students' pathways begin to diverge. That's where belonging and confidence help determine whether someone will keep moving along a STEM pathway or move off that path onto a non-STEM path.” (Dasgupta, NSF 2016)

- Need to feel comfortable and confident
- Want collaborative support
- Feel a sense of belonging
- Involvement

Educational Influences

- "…women students who have had either one-on-one contact with…same-gender professors, experts or peers, feel 'I belong here.' This in turn makes them more confident in their abilities…" (Dasgupta, NSF 2016)
- "Results from several lab and field studies revealed that exposure to female STEM professors and experts enhanced women's positive implicit attitudes toward STEM, increased their identification with STEM, their confidence in STEM, and effort on tests and exams." (Dasgupta)

- High school class offerings
- Authority figure attitudes
  - teacher, parent, advisor
- Female faculty
- Tippie female admissions

NEXT STEPS

Translate findings into recommendations

Recommendations

- Mentorship Program
- BAIS Major Introduction
- WiSE Recognition
- Marketing the BAIS Program in High Schools
- Faculty Bias
- Intro Course Refinement

Top Recommendations

Create Peer Mentorship Program

- Female-centric organization
- Connect Junior and Seniors with Freshman and Sophomores
- Volunteer program
- One to many
- Faculty advisor facilitated

Recognition by WiSE

- Obtain BAIS STEM approval by Iowa's WiSE program
- Acknowledge and embrace STEM designation
- Encourage engagement with campus programming

Introduce the BAIS Major

- Create specialized marketing for BAIS major
- Sell major at Tippie Direct Admit Seminar & Introduction classes
- Encourage faculty to speak the refined language of "what is BAIS"
- Create high school connections and market to target schools
- Host a "Get to Know Us" event featuring women industry and major

State Farm Grant

Women in BAIS Mentorship Program Funding

- Funded female faculty appointment
- Timeline:
  - Summer: Curriculum and schedule creation
  - Early Fall: Recruitment for BAIS declared 3rd and 4+ year mentors and invitation for undeclared 1st and 2nd year mentees
  - Spring: Women in Analytics Conference\Workshop
- Funding Needs:
  - $16,000 pay per year
  - $7,000 activities allowance (travel, workshops, conference per year

Faculty Bias Workshop with Intro Course Refinement

- Funded workshop for all faculty and TA's
- Create faculty "Women in BAIS" sponsor role
- Use external resources to refine Information Systems and Business Analytics Introduction classes
- Option: Create discussions sections with equally balanced group of men and women
- Timeline:
  - Summer: Research organization for workshop
  - Fall '19: Host workshop
  - Spring '20: Work to refine introductory classes
- Funding Needs:
  - $1500/faculty member for workshop
  - $30,000 for course refinement

Full Recommendation Matrix

	Recommendation	Influence Level	Effort	Term
1	Women in BAIS Mentoring Program	Department	Medium	Short (Fall 2019)
2	WiSE Recognition	University	Low	Short (Fall 2019)
3	Faculty Bias Exploration (UG faculty focus)	Department	Medium	Short (Spring 2020)
4	Refine Intro Courses (Info Sys and Bus Analytics)	Department	Medium	Mid-term (Fall 2020)
5	Update Marketing (Add Focus on Social Purpose)	College (TCOB)	Medium	Mid-term (1-2 years)
6	Interdisciplinary Options	College (TCOB)	Low	Mid-term (1-2 years)
7	High School Marketing	College (TCOB)	Medium	Mid-term (2 years)
8	Research Predictive Model Targeting HS Women	College (TCOB)	High	Long Term (2-4 years)
9	Create Learning Teams (Equal Men\Women)	College (TCOB)	Medium	Mid-term (1-2 years)
10	Faculty Balance (40% Women)	Department	High	Long Term (3-5 years)
11	Create Tutoring Program for Women	College (TCOB)	High	Long term (2-4 years)

Appendix

Women in BAIS
Additional Resources

Gender Bias Resources

- Resources for gender bias training:
  - https://wiseli.wisc.edu/
- MIT Teaching Systems, Unconscious bias in teaching
  - https://mit-teaching-systems-lab.github.io/unconscious-bias/
- Harvard - Implicit Bias Test
  - https://implicit.harvard.edu
- National Science Foundation (NSF) Girls in Science and Engineering Teaching Toolkit
  - https://www.nsf.gov/pubs/2006/nsf0659/nsf0659.pdf

Gender Bias Examples in STEM

- Faculty call on men more than women.
- Women tend to be more thoughtful in response, so when called on by faculty if they don’t answer quickly, faculty will move on and call on a male.
- Unequal teams where men outnumber women cause women to be included less.
- Men will interrupt women more often than other men.

References

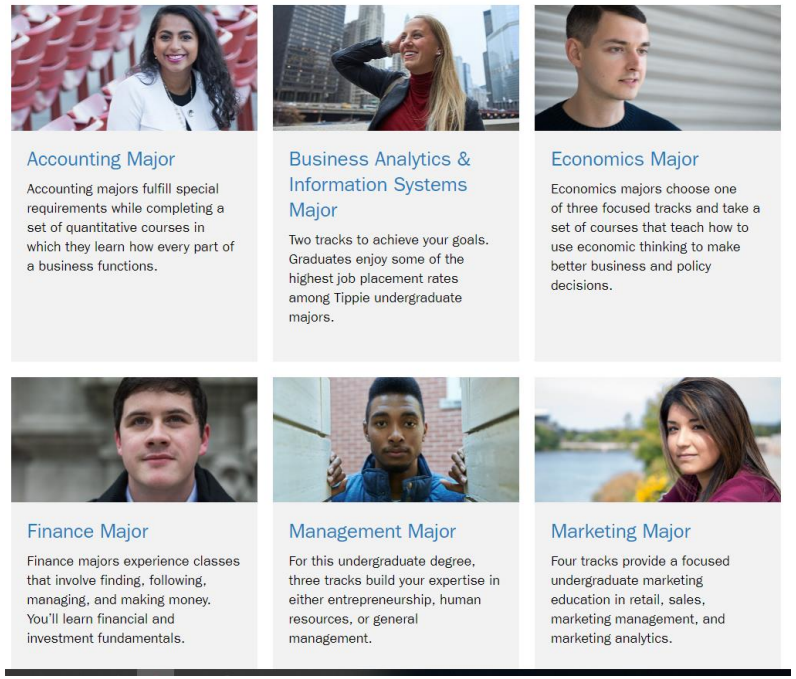
- Carrigan, CM (2017) *Yearning to Give Back: Searching for Social Purpose in Computer Science and Engineering*. Front. Pyschol. 8:1178. https://www.frontiersin.org/articles/10.3389/fpsyg.2017.01178/full
- Buse K (2018) *Editorial: Women's Under-representation in Engineering and Computing: Fresh Perspectives on a Complex Problem.* Front. Psychol. 9:595. https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00595/full
- Beyer, Sylvia. (2006). *Gender differences in Computer Science and MIS majors.* https://www.researchgate.net/publication/281321959_Gender_differences_in_Computer_Science_and_MIS_majors
- Akbulut, Asli. (2017) *Underrepresentation of Women in Management Information Systems: Gender Differences in Key Environmental Barriers.* https://waset.org/publications/10007287/underrepresentation-of-women-in-management-information-systems-gender-differences-in-key-environmental-barriers
- *Dasgupta, Nilanjana, Professor, Department of Psychological and Brain Sciences, University of Massachusetts at Amhurst* http://people.umass.edu/nd/index.html

Image – What is this Major?

The message is “go into this major if you want to make a lot of money”.

Does this provide information students are looking for?

Is there a diverse implementation of analytics and information systems? Careers focused on a social purpose?



Accounting Major

Accounting majors fulfill special requirements while completing a set of quantitative courses in which they learn how every part of a business functions.

Business Analytics & Information Systems Major

Two tracks to achieve your goals. Graduates enjoy some of the highest job placement rates among Tippie undergraduate majors.

Economics Major

Economics majors choose one of three focused tracks and take a set of courses that teach how to use economic thinking to make better business and policy decisions.

Finance Major

Finance majors experience classes that involve finding, following, managing, and making money. You'll learn financial and investment fundamentals.

Management Major

For this undergraduate degree, three tracks build your expertise in either entrepreneurship, human resources, or general management.

Marketing Major

Four tracks provide a focused undergraduate marketing education in retail, sales, marketing management, and marketing analytics.

There's money in making sense.

Big data has become big business. Tippie's two-track business analytics and information systems (BAIS) major will position you to excel in this exciting new field.

Build your career on the cutting edge

Every time you swipe a debit card, fill out a timesheet, or like something on social media, you create data. Every time you visit a doctor, stream a movie, or give money to a charity, you create data. It can tell doctors and hospitals which treatments are most effective. It can tell governments where to invest tax dollars. It can help businesses design better products and services. You can be the person that helps organizations understand the data. You can be the person who helps them keep the data accessible and secure. The opportunities are endless.