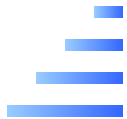


The 2025 Capstone Survey

Current Practices and Trends over Time

Susannah Howe (Smith) and Rustin Webster (Purdue)
with Matthew Turner (Purdue)

1 June 2026



Motivation

- Where do we learn about capstone courses?

**Discussions
+
Informal
benchmarking**

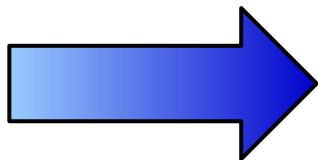
Targeted surveys:

assessment, content,
discipline-specific

Comprehensive surveys:

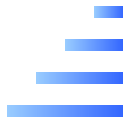
1994
2005, 2015, 2025

- What are current practices?
- How are capstone courses evolving?



Understand, assess, and improve capstone courses





2025 Survey Methods

- Survey Development

- Selection/refinement of 1994, 2005, and 2015 questions
- Addition of new questions/topics
- Updated for Engineering and Engineering Technology
- Qualtrics: 11 sections, 95 questions, intentional logic



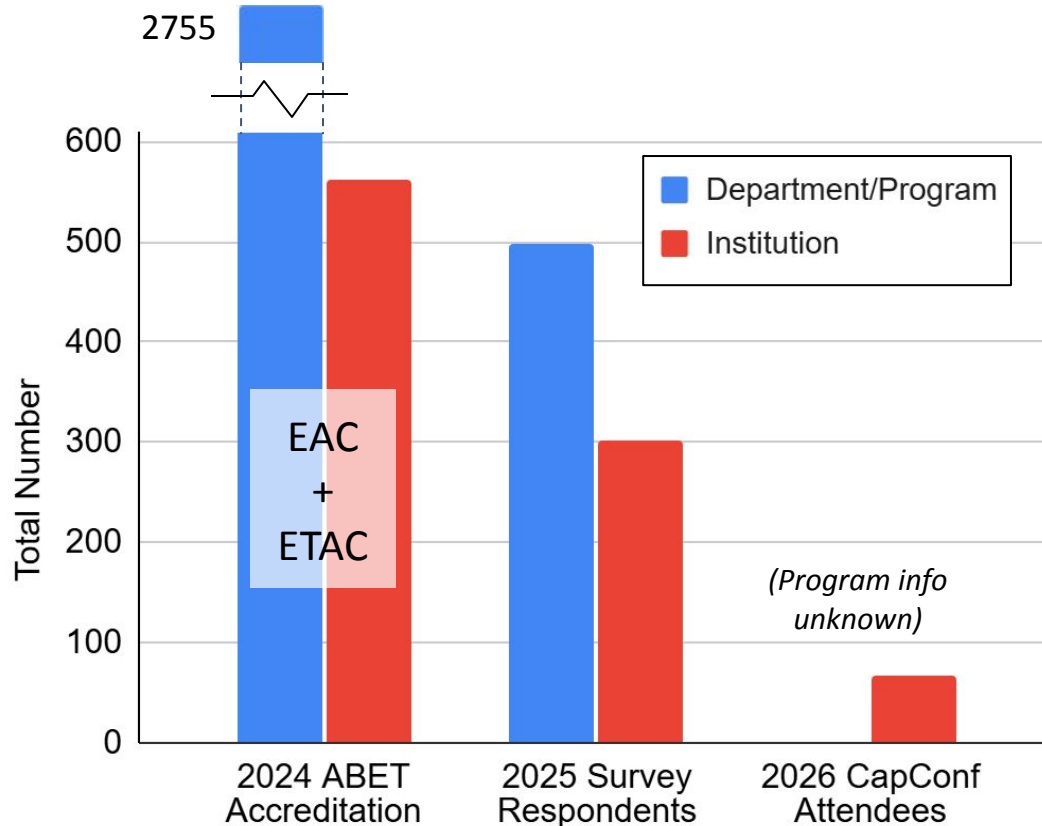
<https://i.ebayimg.com/images/g/1-7AA05w0s8kgQD3/s-11200.png>

- Dissemination/Collection

- Contact list (for ABET **EAC** and **ETAC** programs)
- Email: dept chairs, ASEE division chairs, CapConf attendees
- Survey open from Feb-Mar 2025
- Responses: **512 respondents** → 301 institutions
→ 498 departments/programs



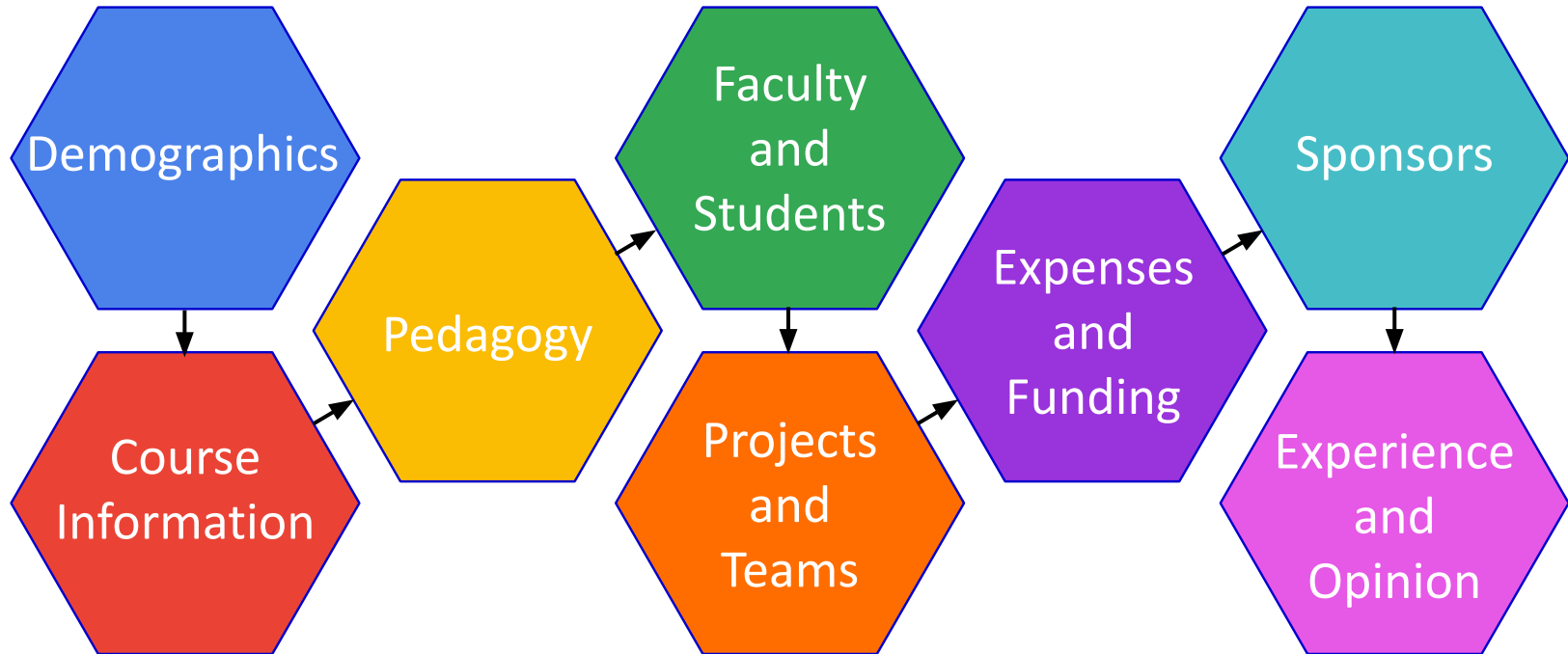
Context and Limitations

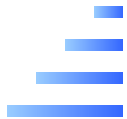


- Large number of responses is only a fraction of total
 - ABET EAC+ETAC Accred = 2755 programs, 563 institutions
 - Survey = 498 programs, 301 institutions
- Voluntary participation, respondents could skip questions
- Self-reported data and respondent estimates

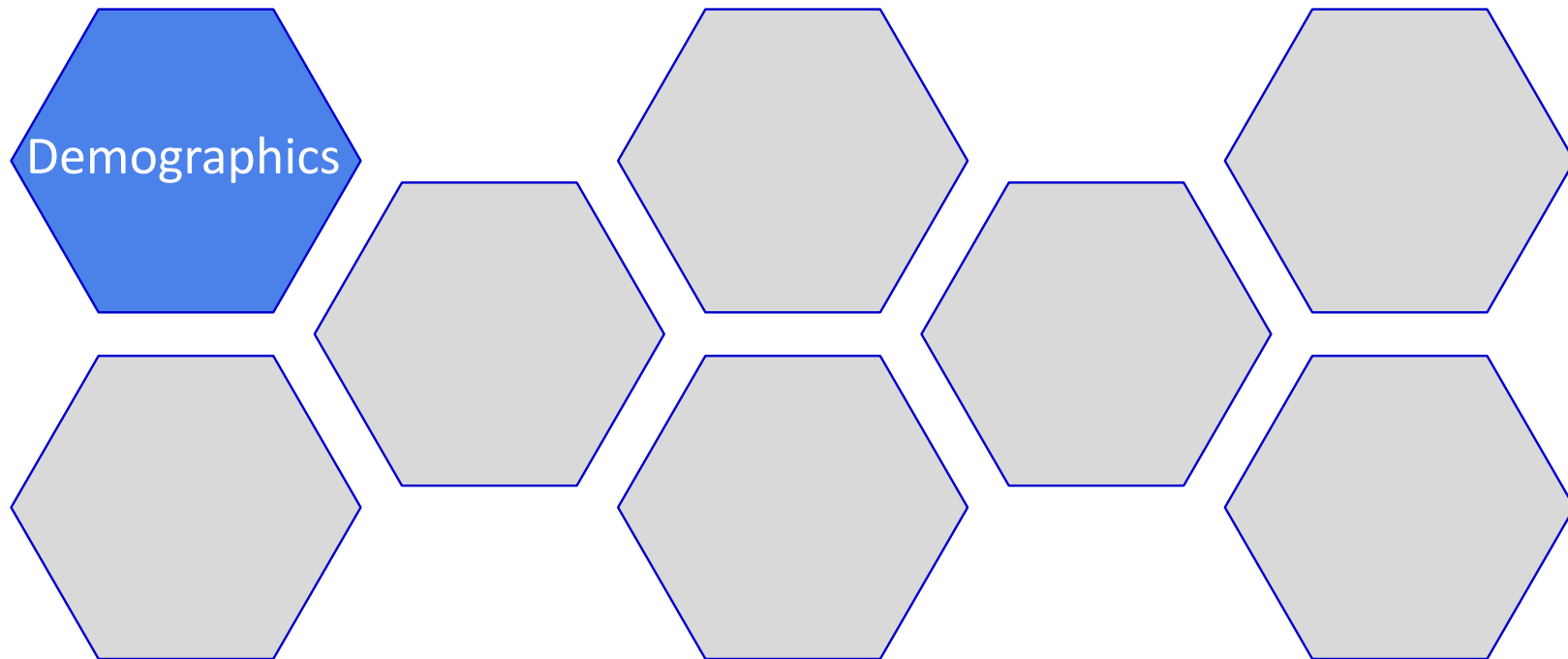


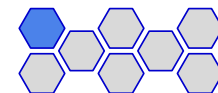
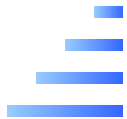
Results Overview



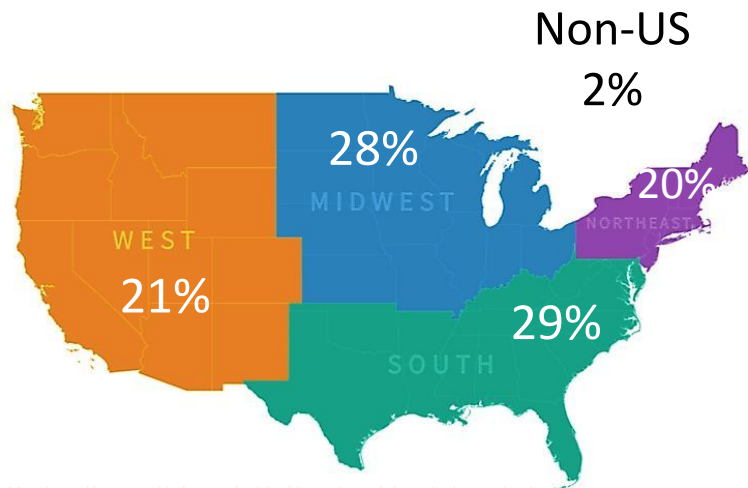


Demographics





Institution



Map: <https://www.worldatlas.com/articles/the-regions-of-the-united-states.html>

- Respondents are geographically distributed across the U.S.

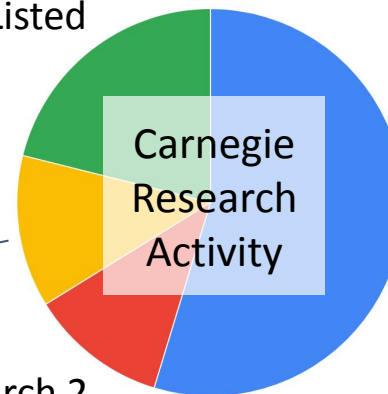
Institution Type:

39% = Private (non-profit)
61% = Public

N/A or Not Listed

Research
College or
University

Research 2

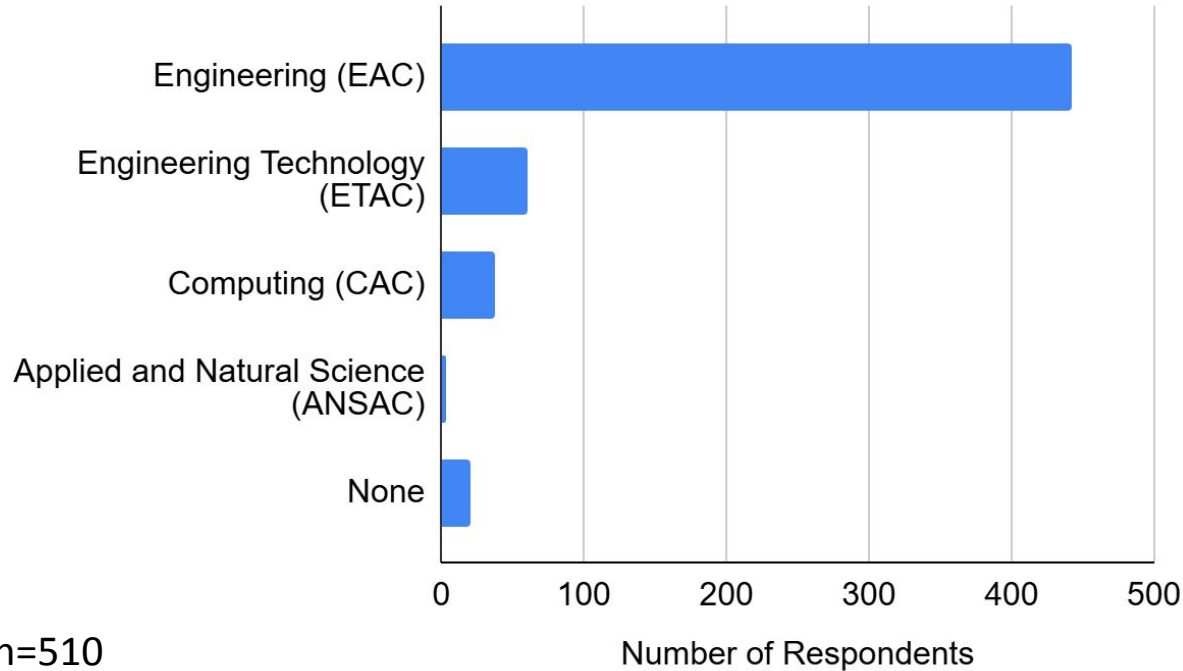
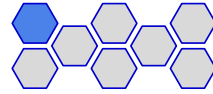


Research 1

- Respondents are distributed across all categories, but >50% are R1 institutions



ABET Accreditation

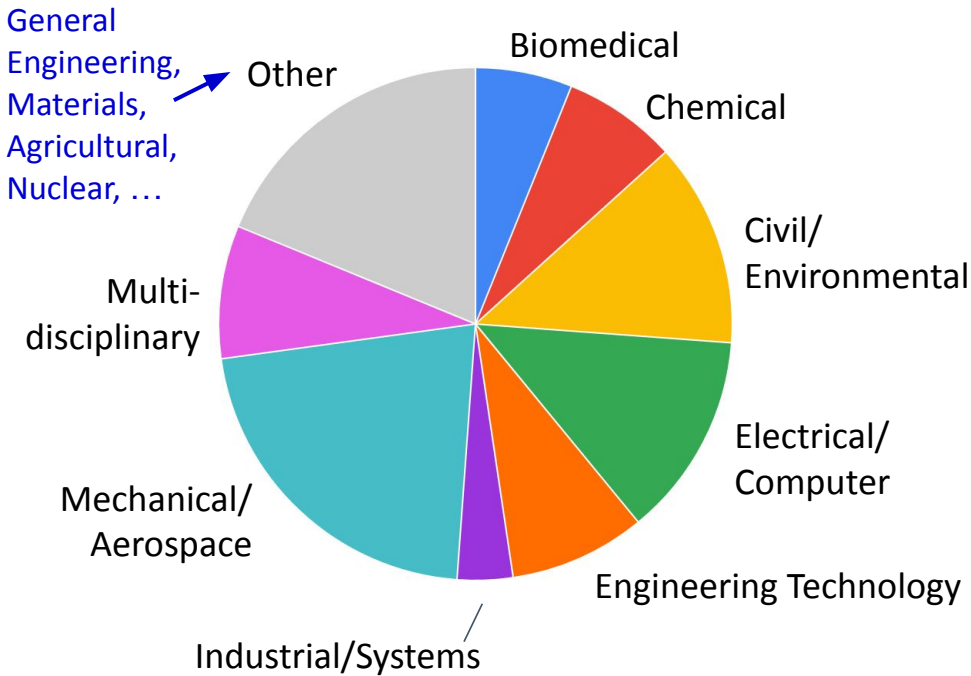
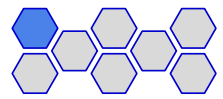


n=510

- Vast majority of respondents have ABET-EAC accreditation
- Some ETAC, CAC, and ANSAC as well; some none at all
- A few respondents noted more than one

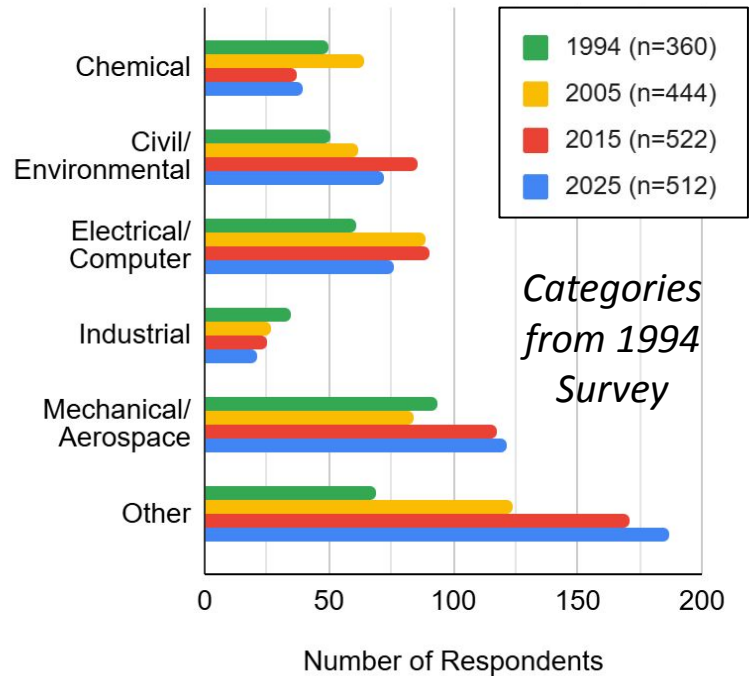


Discipline

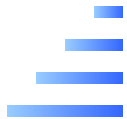


n=512

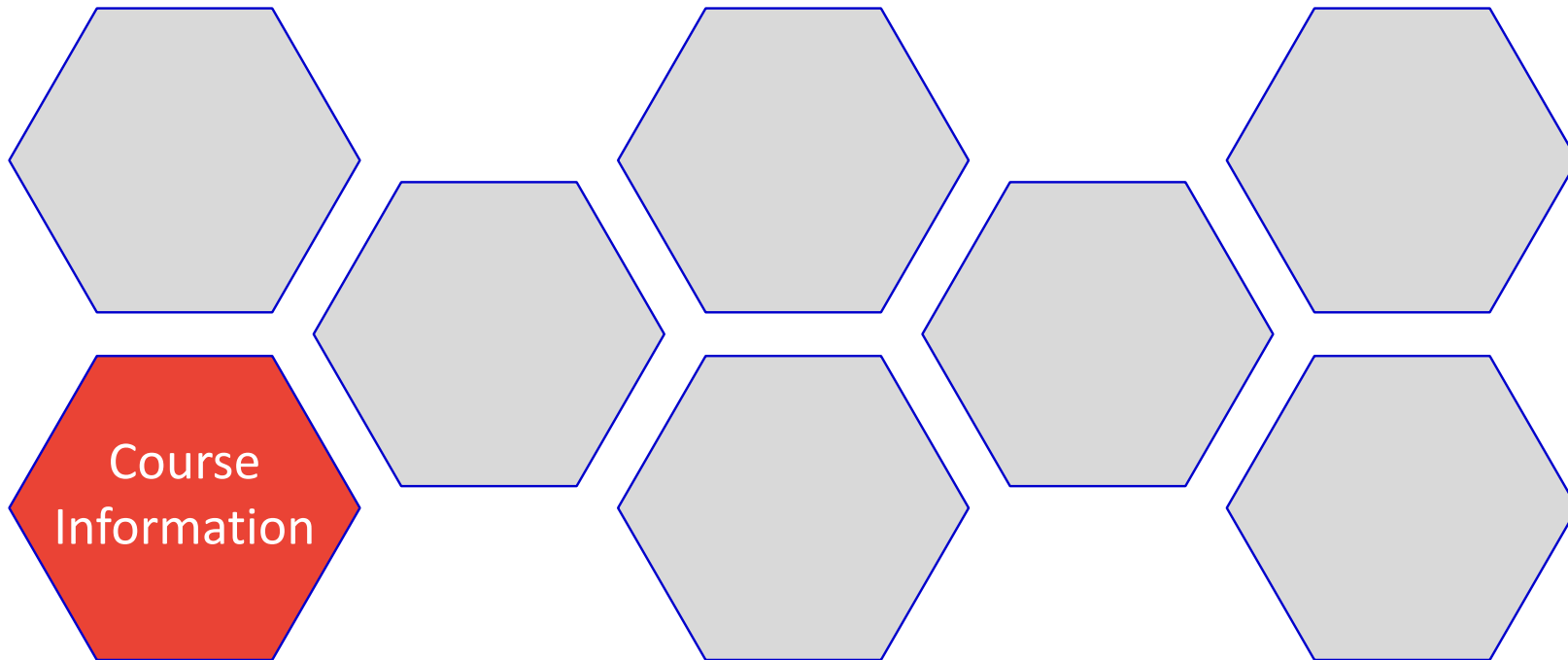
- Respondents are spread across disciplines



- Similar distribution across all surveys
- Rise of "Other" = Biomed, Multi, General, ...

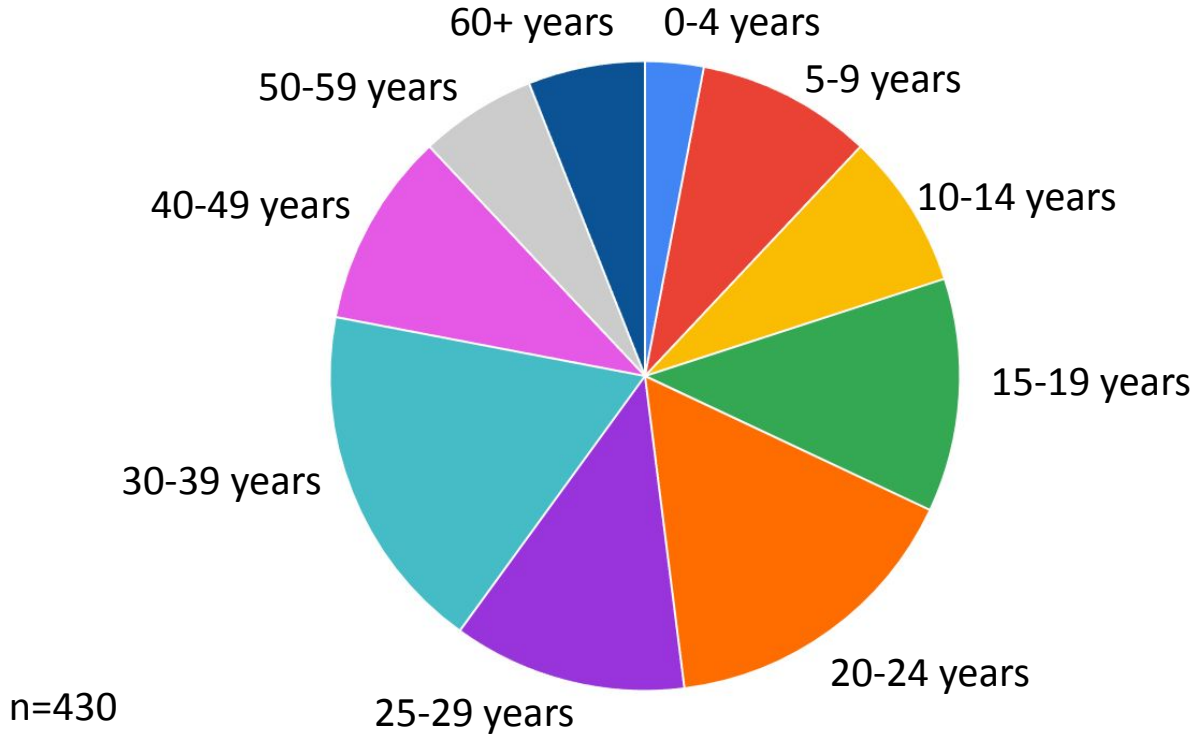
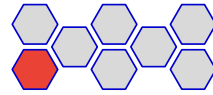


Course Information



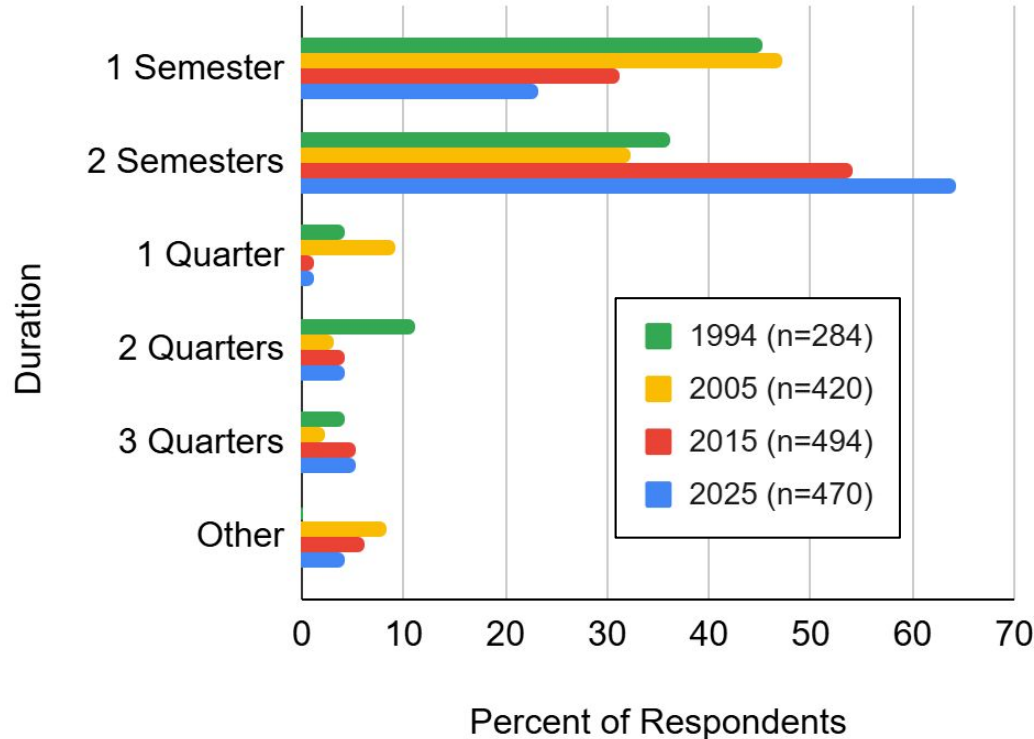
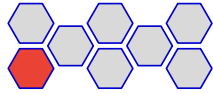


Capstone Course Age

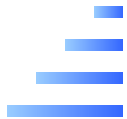


- Wide range of ages: some quite recent, others 60+ years old
- 1/3 of respondent capstone courses are 30+ years old
- Oldest responding course is 106 years; 7 are 100+ years

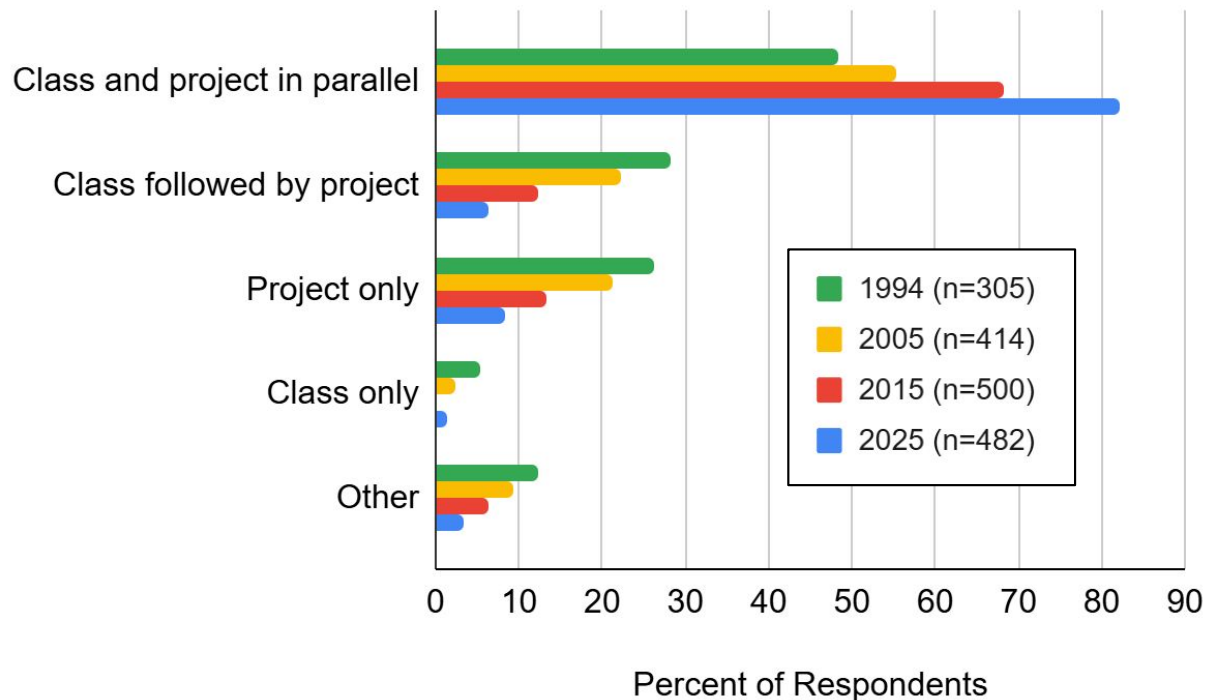
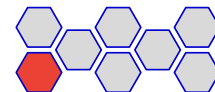
Capstone Course Duration



- More than 60% of respondents now have a 2-semester capstone
- Over time: increase in 2-semester, drop in 1-semester
- "Other" responses are even longer: 3- and 4-semester



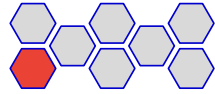
Structure and Sequence



- More than 80% run class and project in parallel; steady increase over time
- "Class then Project" and "Class Only" options are rare
- "Other" responses: many note that sequence differs across two semesters



EGR/ET Disciplines Involved



Engineering (n=444)

2+ Disciplines = 52%

5+ Disciplines = 16%

What **engineering** departments/programs (faculty and/or students) participate in your capstone experience?

Most common:
Mechanical Eng.
Electrical/Electronics Eng.
Computer Eng.
Civil Eng.
Biomedical/Bioeng.

What **engineering technology** departments/programs (faculty and/or students) participate in your capstone experience?

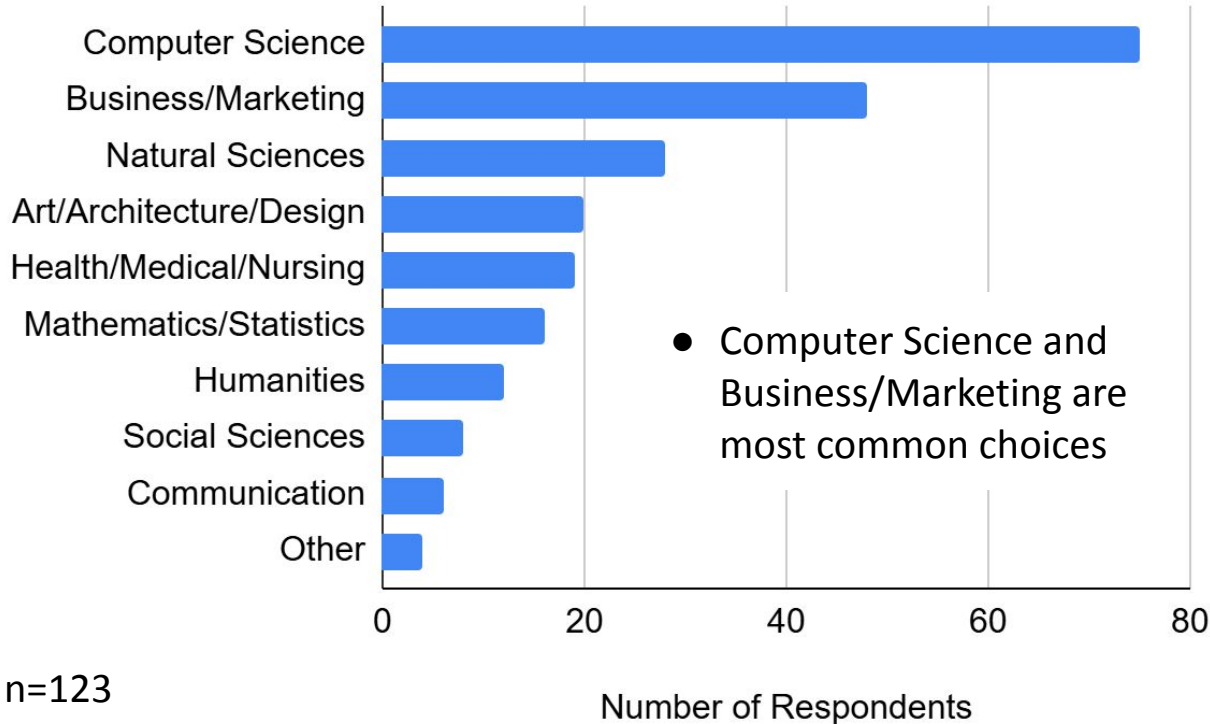
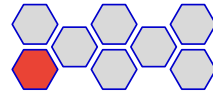
Engineering Technology (n=95)

2+ Disciplines = 49%

5+ Disciplines = 9%

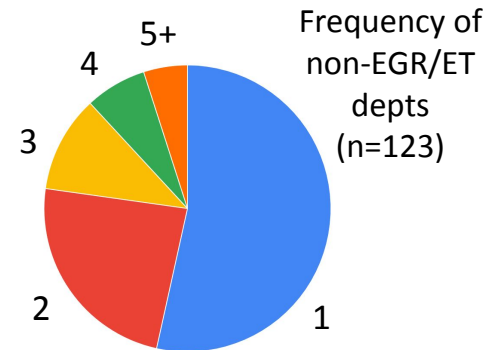
Most common:
Electrical/Electronics ET
Mechanical ET
Computer ET

non-EGR/ET Disciplines Involved

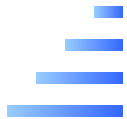


n=123

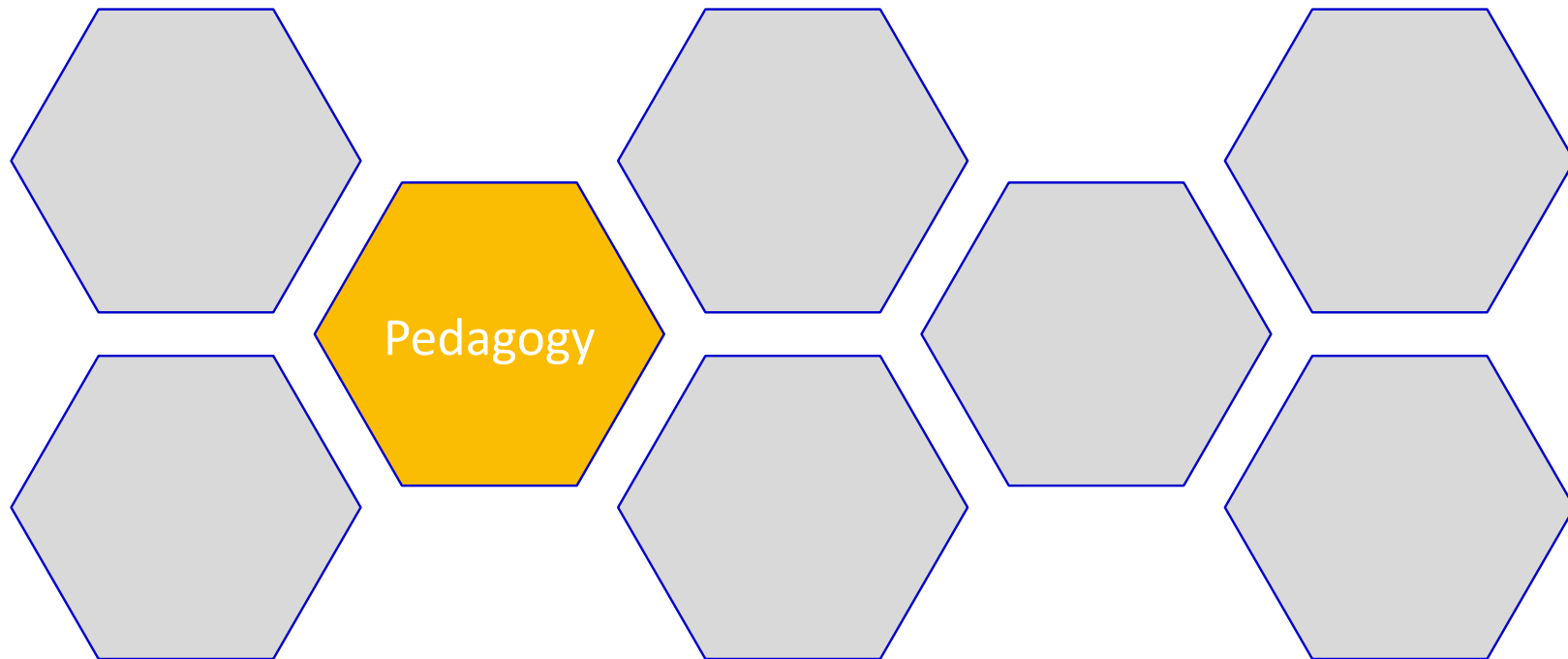
What departments/programs (faculty and/or students) outside of engineering and engineering technology participate in your capstone experience?

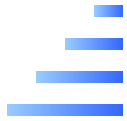


● Majority include 1 or fewer

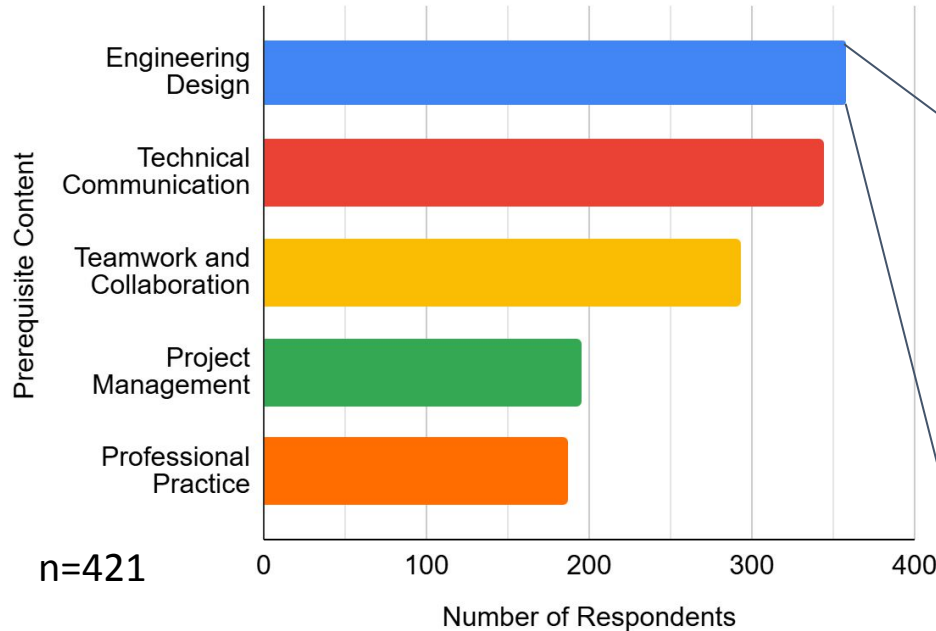
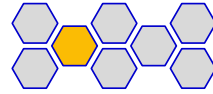


Pedagogy

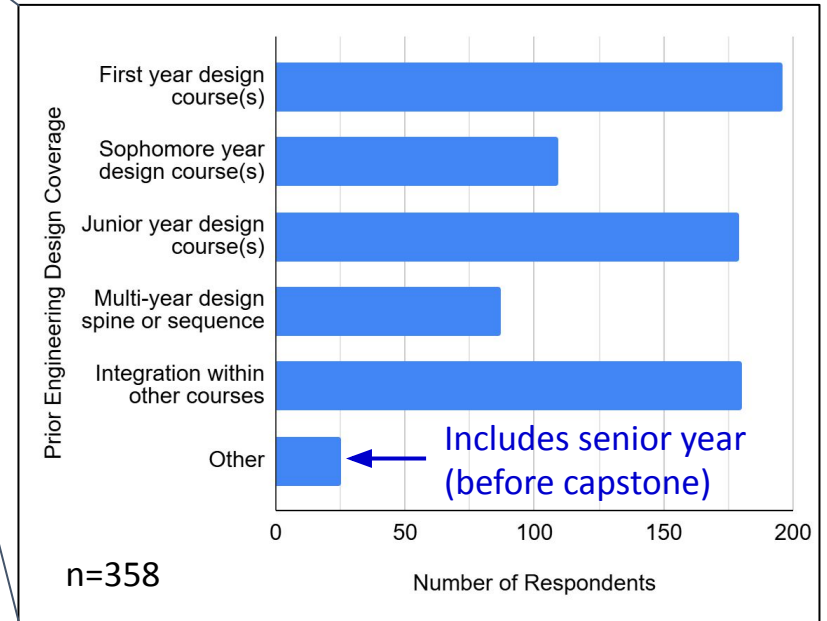




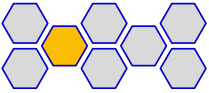
Prerequisite Content



- Engineering design is prevalent across all four years, especially FY, Junior, and integrated in other courses



- Engineering Design and Technical Communication are the most common prerequisite topics



Topics in Capstone

Top 5 topics overall, based on percent of respondents:

1994

Oral communication
Concept generation
Teamwork
Planning/scheduling
Engineering ethics

2005

Written communication
Oral communication
Engineering ethics
Planning/scheduling
Decision making

2015

Written communication
Planning/scheduling
Oral communication
Concept gen/selection
Team bldg/teamwork

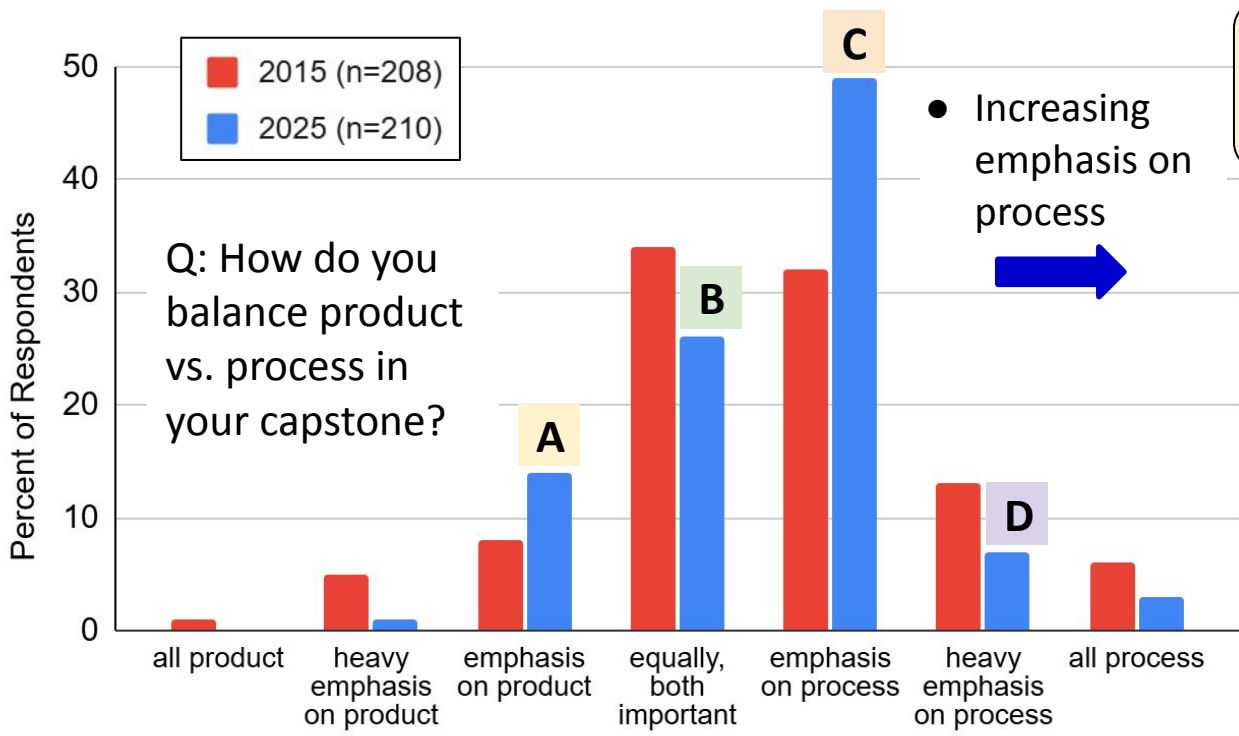
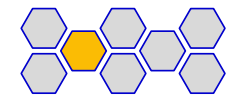
2025

Oral communication
Written communication
Planning/scheduling
Engineering reqs/specs
Eng. design processes

2025 Data	Lecture	Engineering design process	Engineering reqs/specs	Planning/scheduling	Concept eval/selection	Engineering ethics
	Individual Assignment	Written communication	Engineering ethics	Oral communication	Visual communication	Engineering reqs/specs
	Team Project	Oral communication	Written communication	Visual communication	Engineering reqs/specs	Design documentation
	Other Method	Lifelong learning	Diversity, equity, inclusion	Entrepreneurship	Analysis tools (e.g., FEA)	Confidentiality/NDAs



Product vs. Process



A: Definitely weighted more towards product, but they get credit for the process steps as well

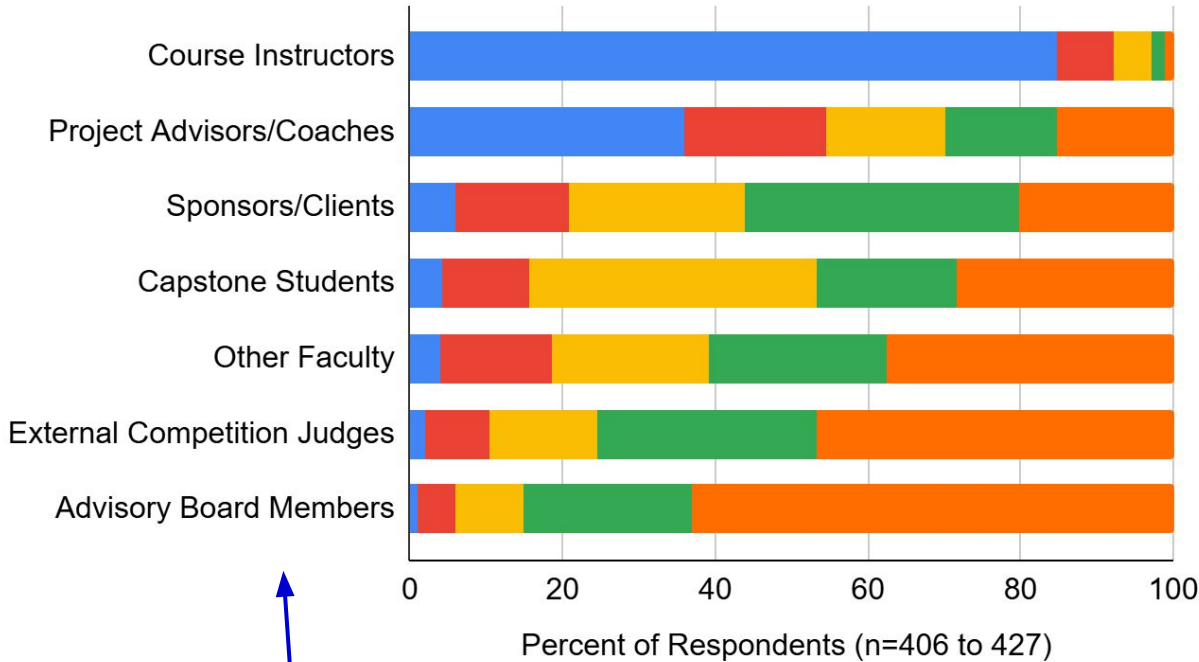
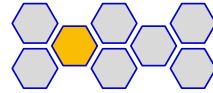
B: We stress both. You can't have one without the other and design something meaningful.

C: Our focus is more on process than product. Learning the process is the goal; the projects are a means to that end.

D: Very focused on the process...we teach them to fish and don't really care what they catch.



Contributors to Grading



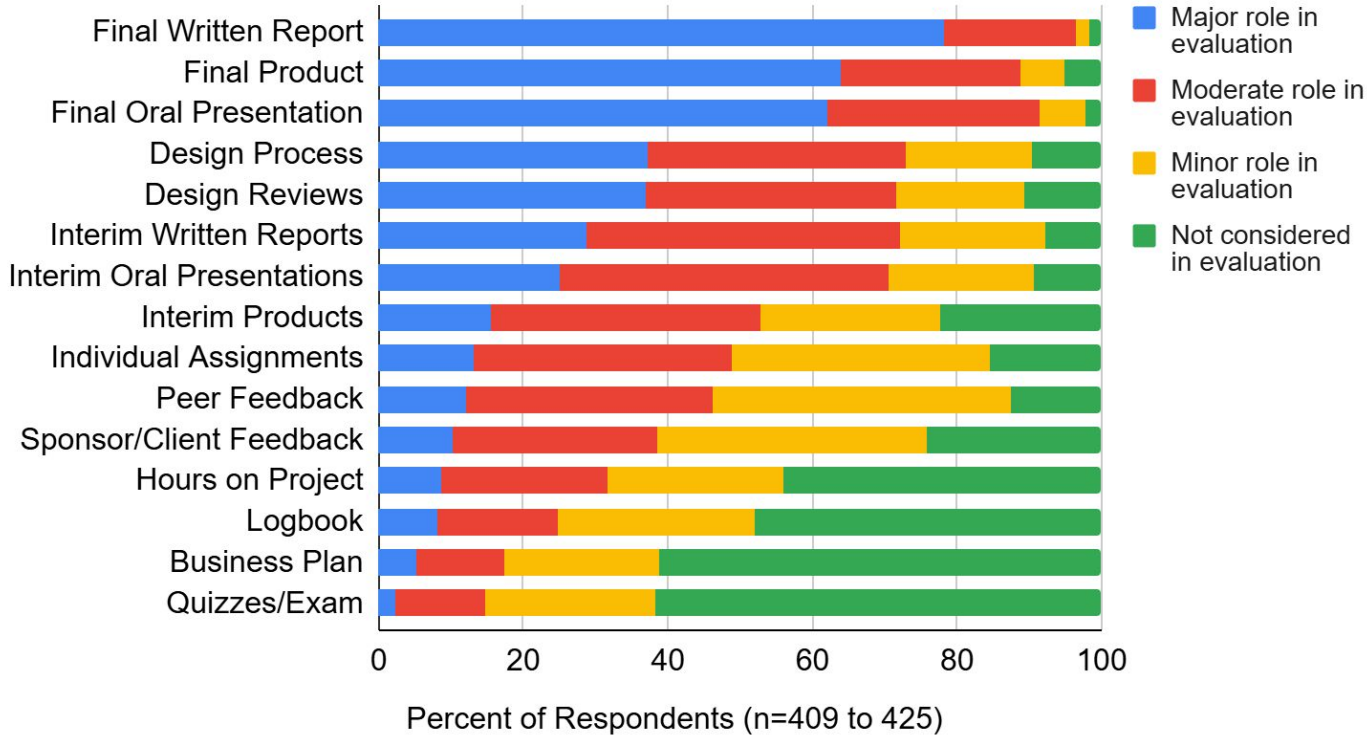
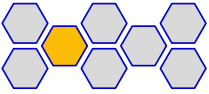
- High input on course grades
- Moderate input on course grades
- Limited input on course grades
- Evaluate projects but do not contribute to course grades
- No role at all

- Instructors and coaches have largest role in grading
- For >50% of respondents, sponsors/clients don't contribute to course grades

Additional "write-in" graders = TAs and Technical Communication personnel

Q: Does your capstone experience use a **pass/fail grading system** for the final grade?
97% of respondents = **NO**

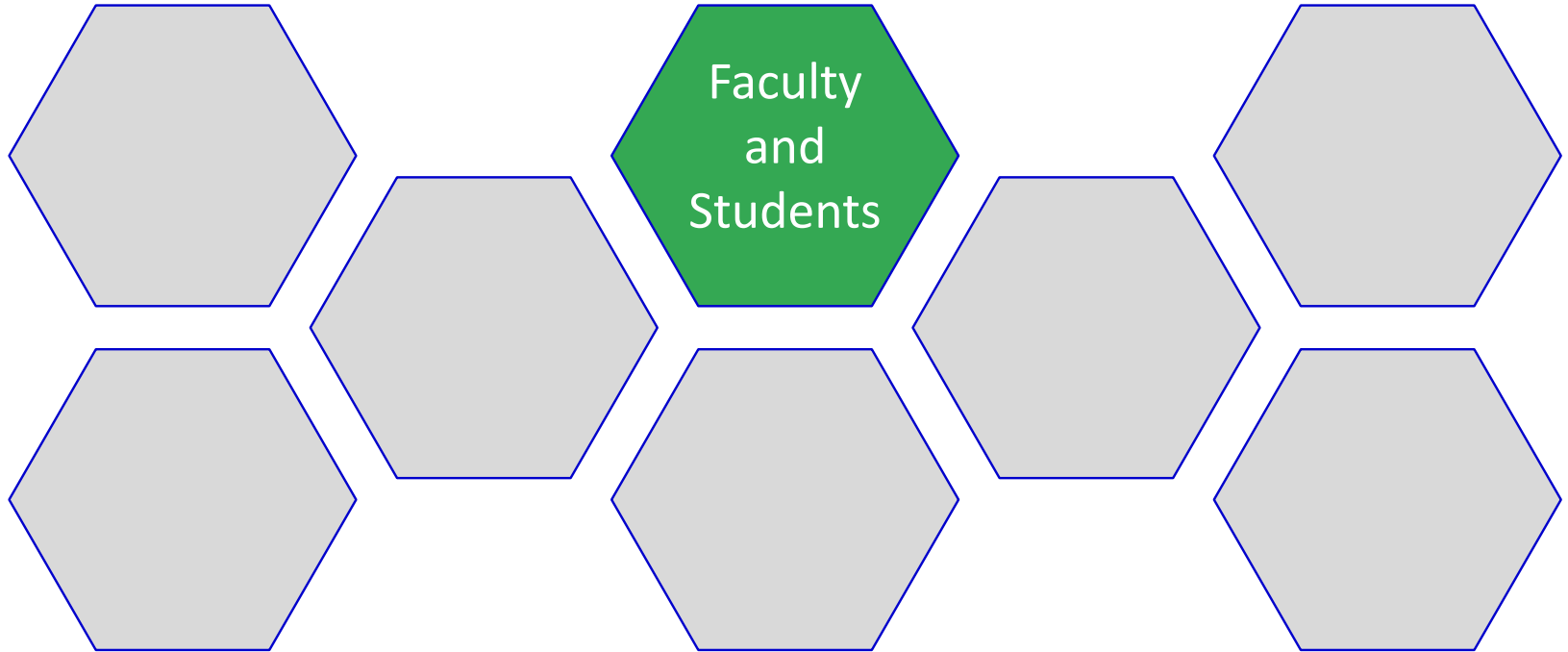
Evaluation of Deliverables



- Final report, product, and presentation have biggest role in evaluation
- Process, interim work, and design reviews also important
- Peer feedback has at least minor role for ~90% of respondents

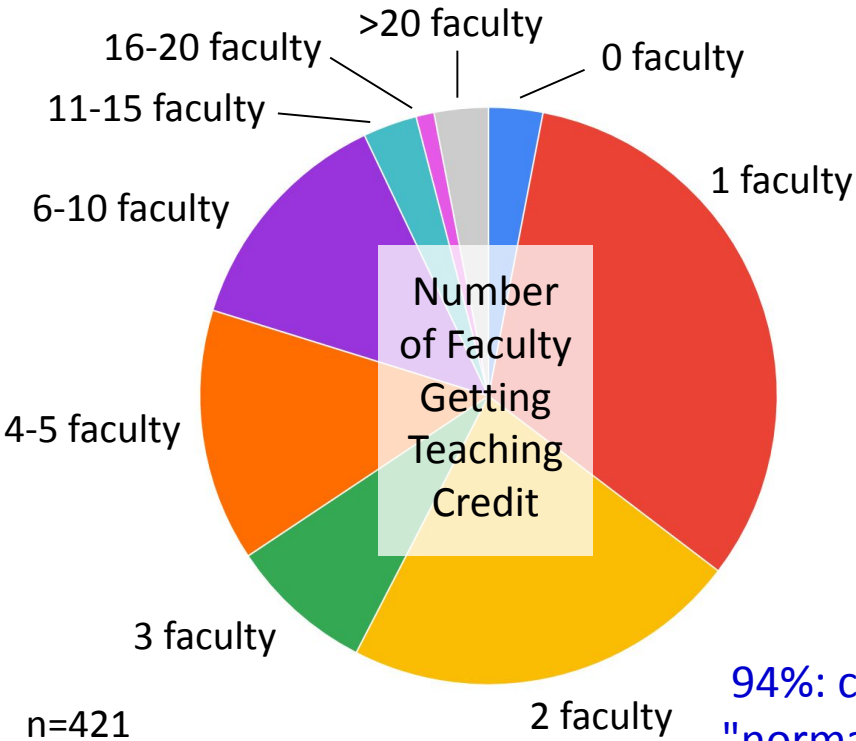
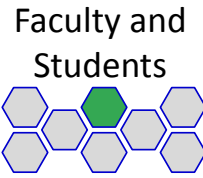


Faculty and Students



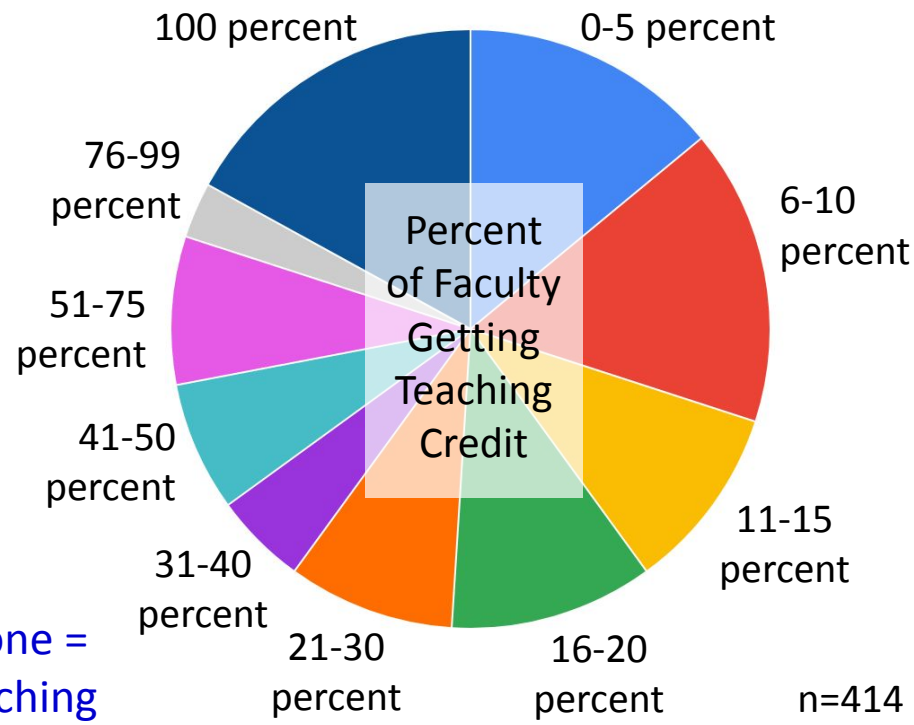


Teaching Credit for Capstone

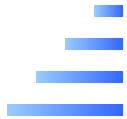


n=421

94%: capstone = "normal teaching activity" for T&P



n=414



Instructional Structure

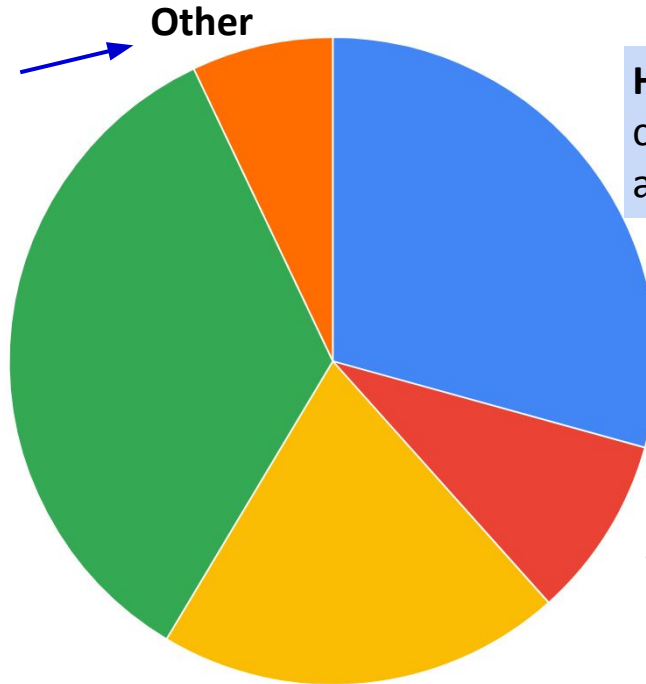


Hybrids, variability across semesters, specialty faculty, and informal advising

Solo: One faculty only for all course instruction and coordination

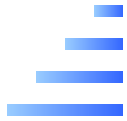
n=427

Shared: Multiple faculty with shared responsibility for all course instruction and coordination

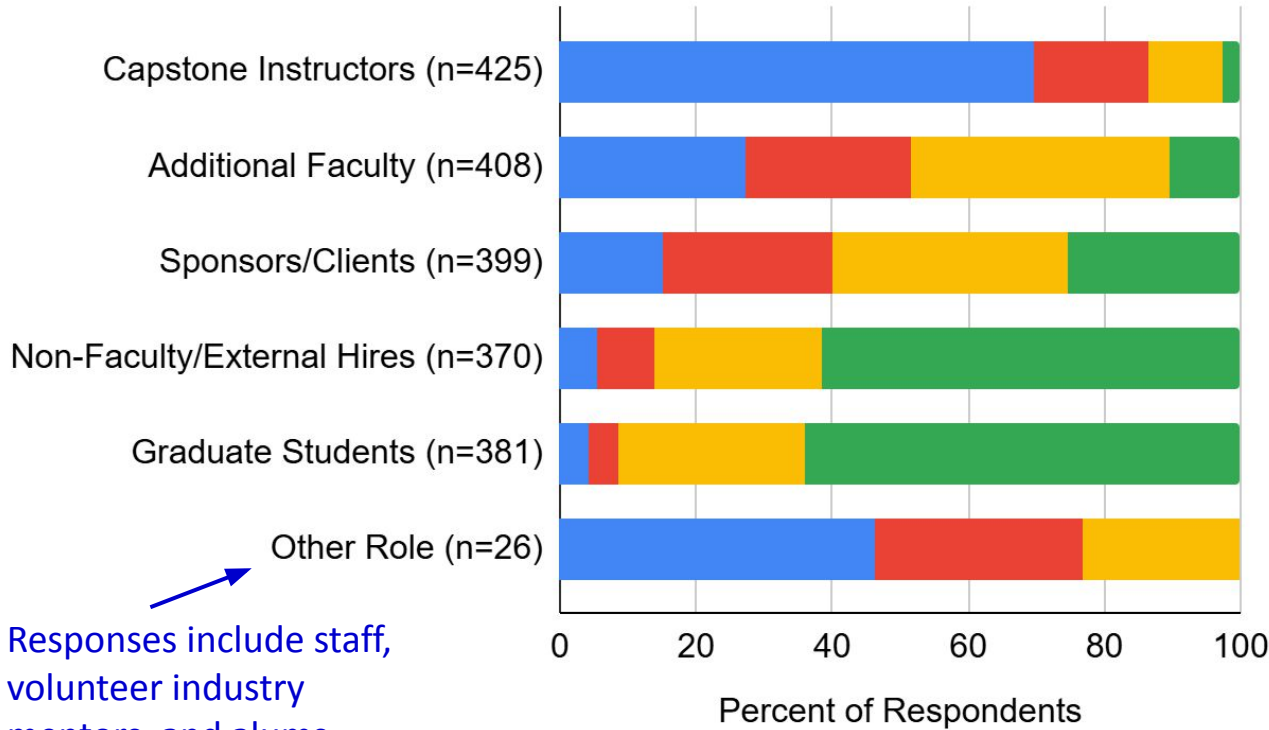
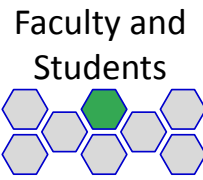


Hierarchy: One lead faculty for course instruction and coordination, and additional support faculty

Shared Hierarchy: Multiple lead faculty for course instruction and coordination, and additional support faculty



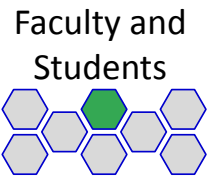
Advising/Coaching Role



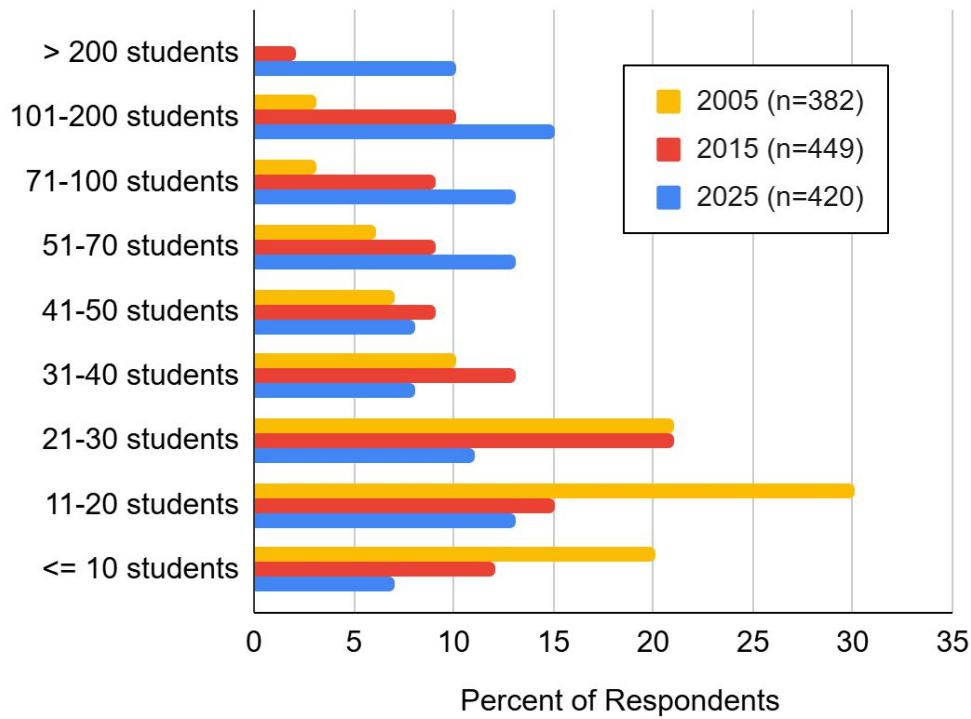
Responses include staff, volunteer industry mentors, and alums

- Capstone instructors and other faculty are most frequently noted advisors/coaches
- Sponsors/clients serve as advisors/coaches at least sometimes for 75% of respondents

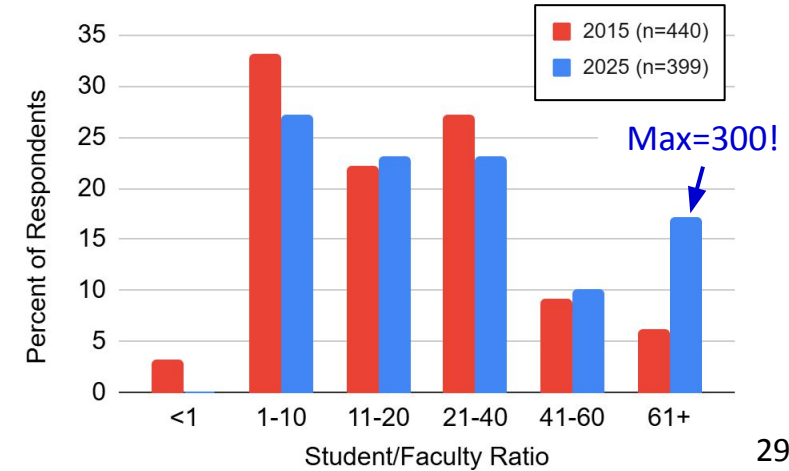
of Students per Capstone Cycle

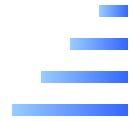


2025: students = **ugrad seniors** for 90% of respondents

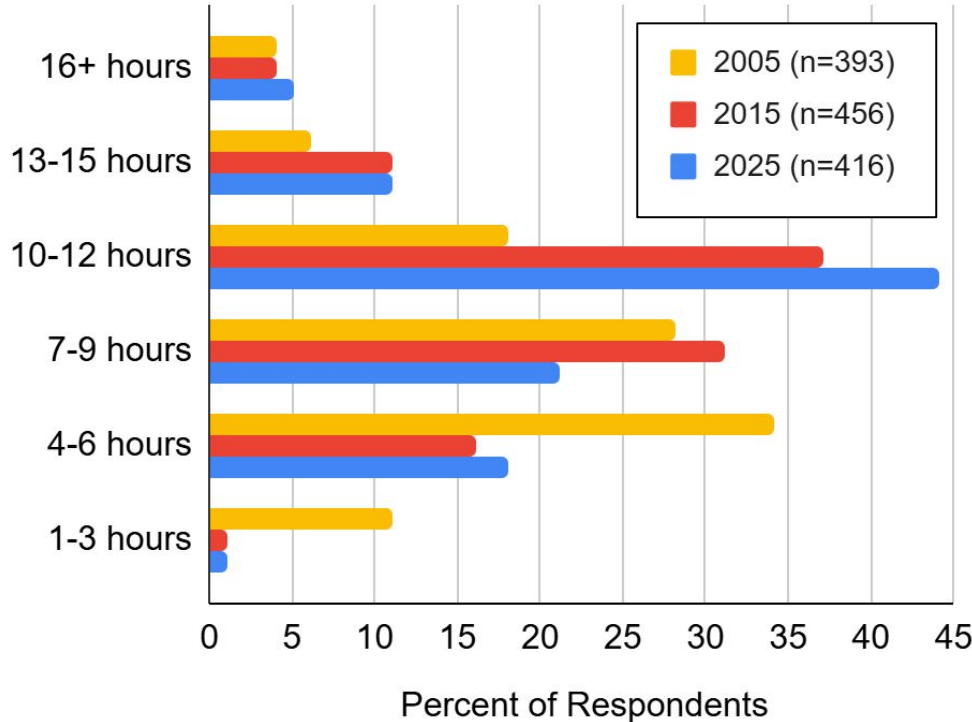
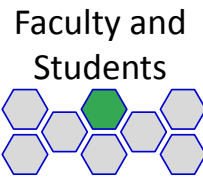


- Number of capstone students have been increasing over time
- 2025: Median # of students is 55; max is 1200 (!)
- Student/faculty ratio also increasing

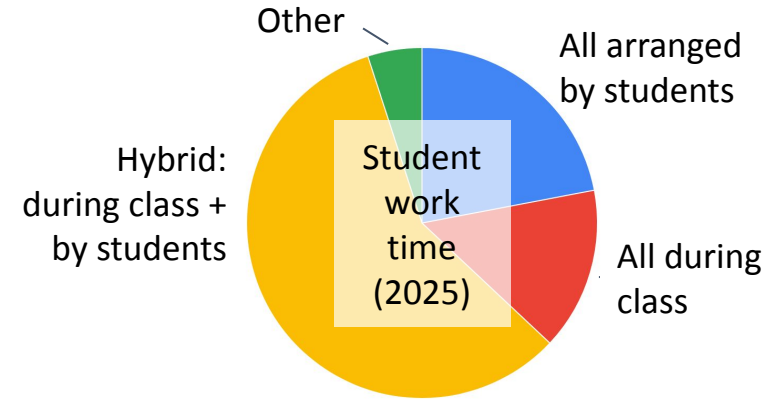




Expected Student Hours/Week

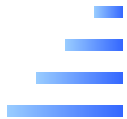


- Expectations: median bracket is 10-12 hours per week in 2025; unchanged from 2015

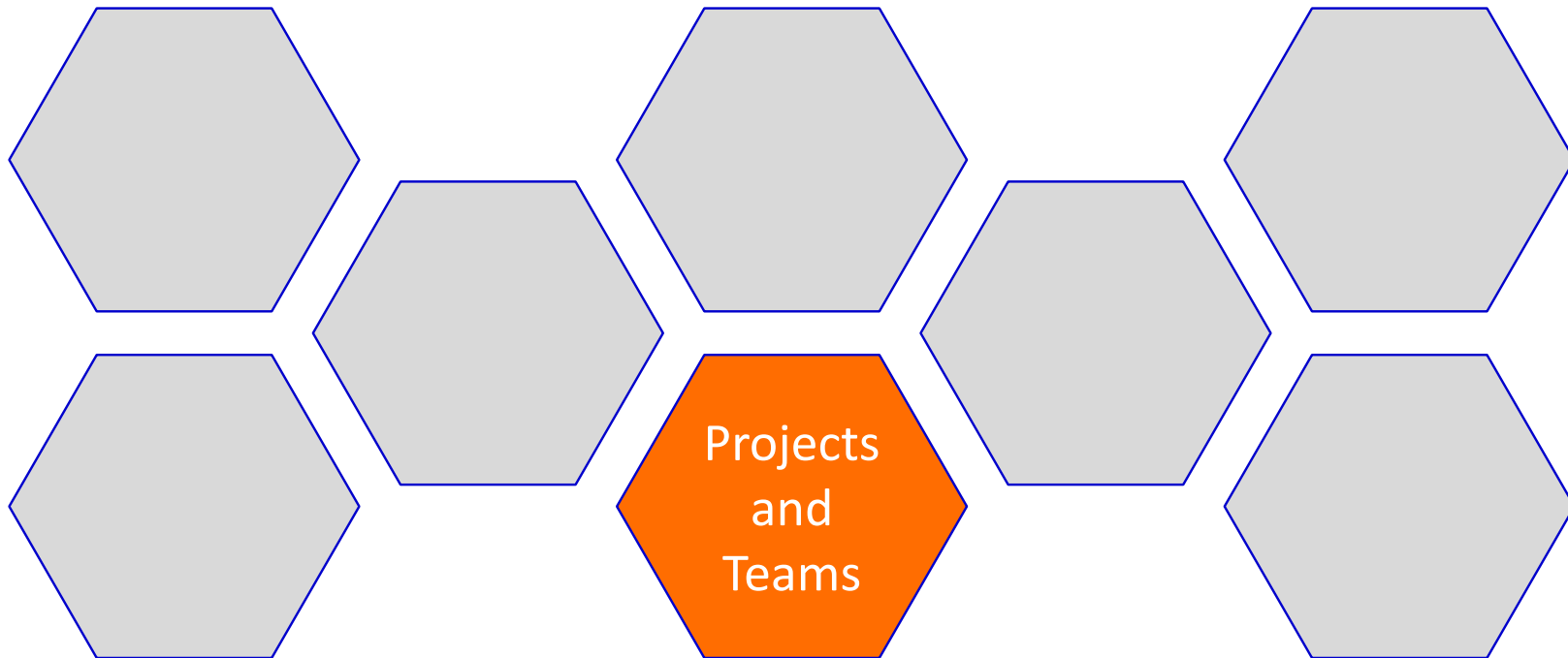


- Arranging work time: hybrid option is most common

n=421

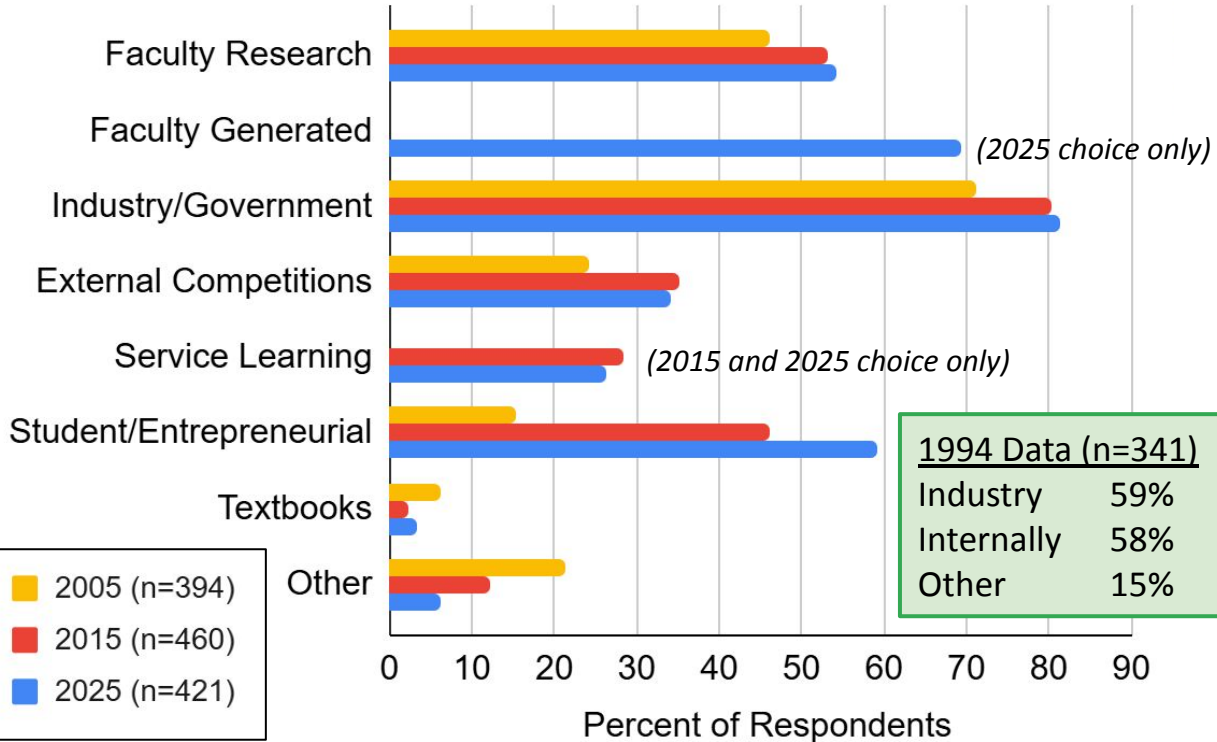
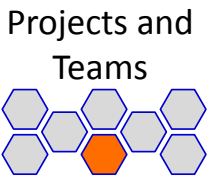


Projects and Teams



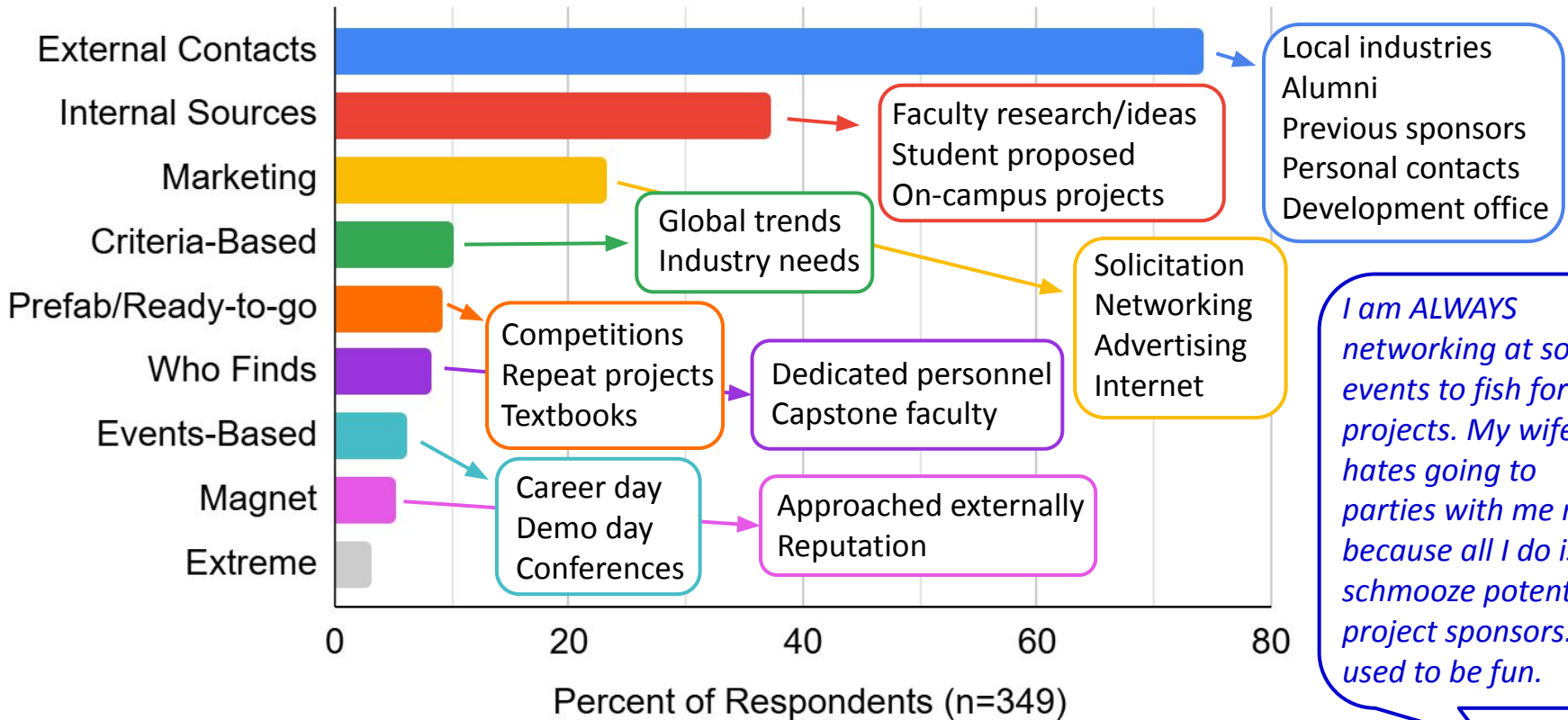


Capstone Project Sources



- Most common = industry/gov't, followed by faculty generated and faculty research
- Continued increase in student/entrepreneurial projects
- "Other": alums, clinicians, med school

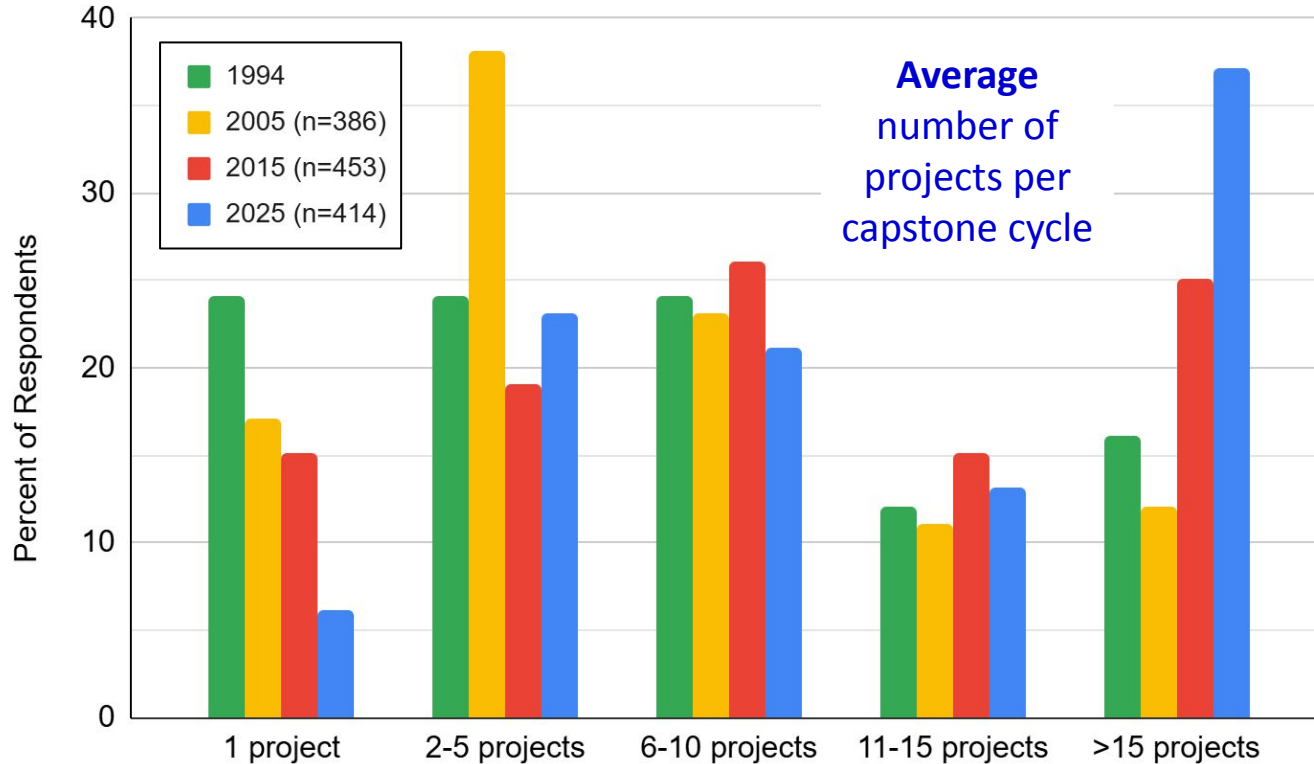
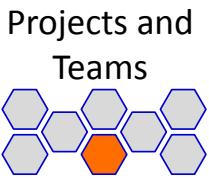
Finding Capstone Projects



I am ALWAYS networking at social events to fish for projects. My wife hates going to parties with me now, because all I do is schmooze potential project sponsors. I used to be fun.



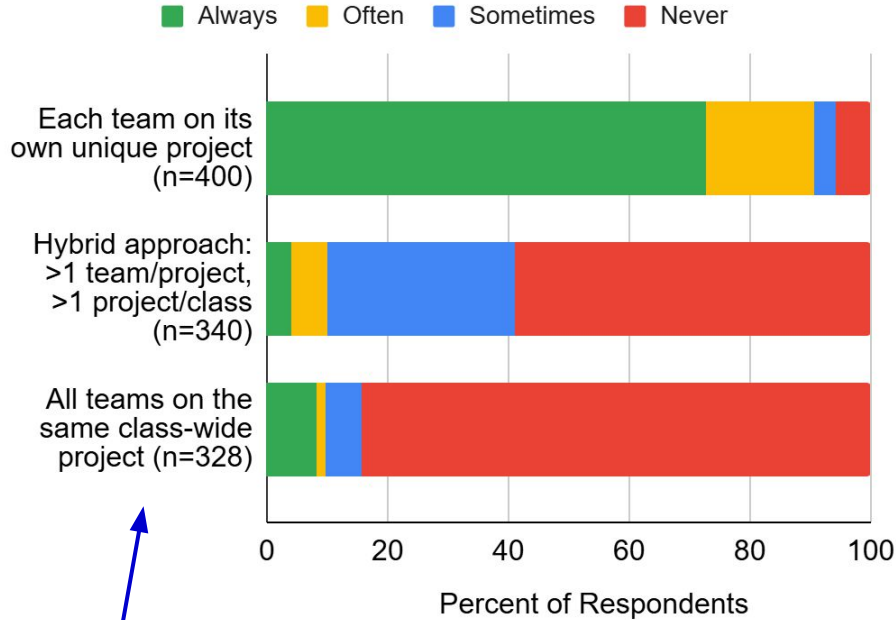
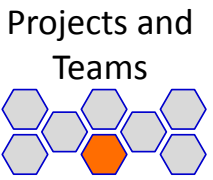
of Projects per Cycle



- All years span range from 1 to >15 projects per cycle
- Increasing number of projects: 37% of 2025 respondents have >15 projects
- 2025: Median = 10; High end = 100+ with max of 400!

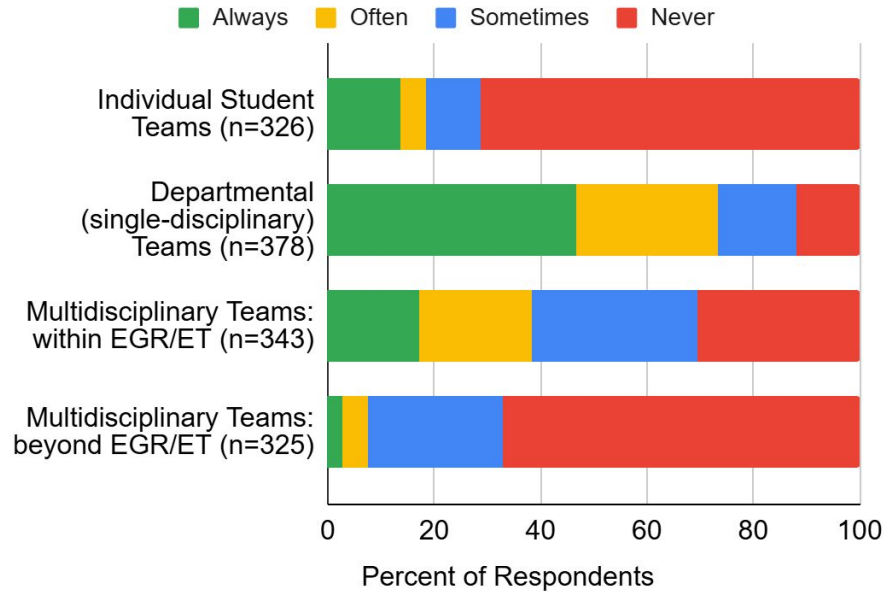


Teams to Projects

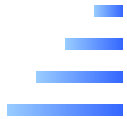


Max teams on same project = 40

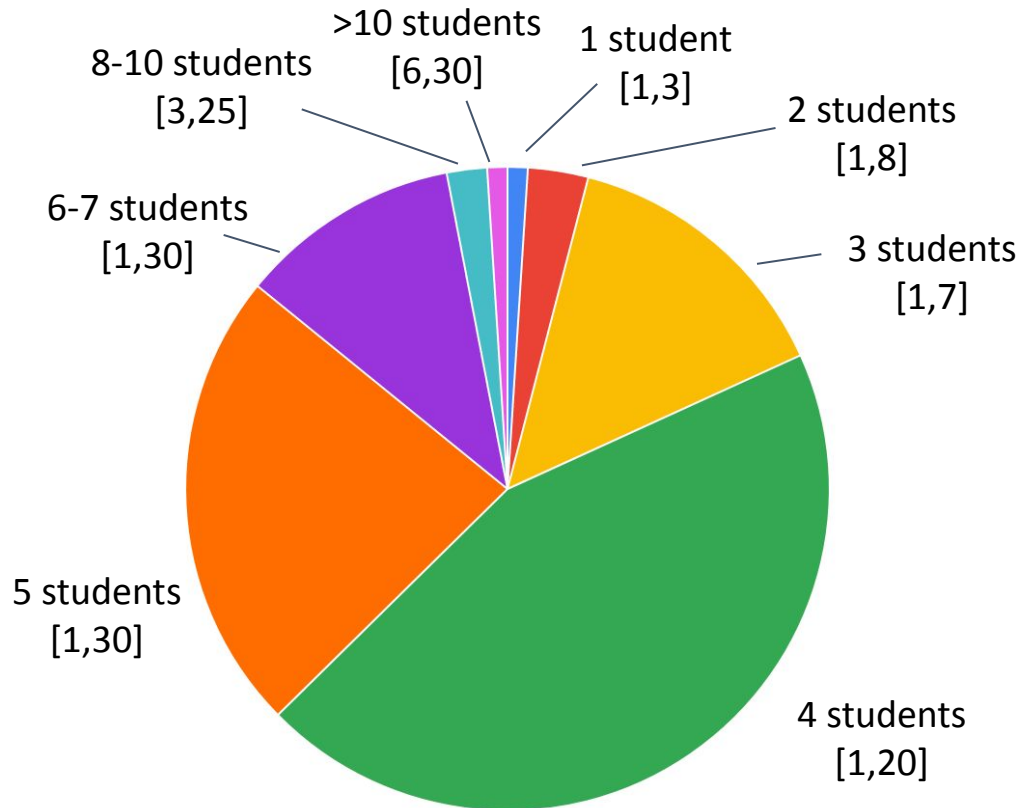
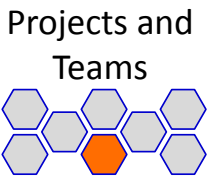
- Assigning each team to its own **unique project** is the most common approach



- **Departmental** teams are most common, followed by multidisciplinary teams
- 70% **never** use **individual** student teams

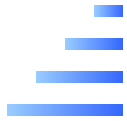


Students per Team

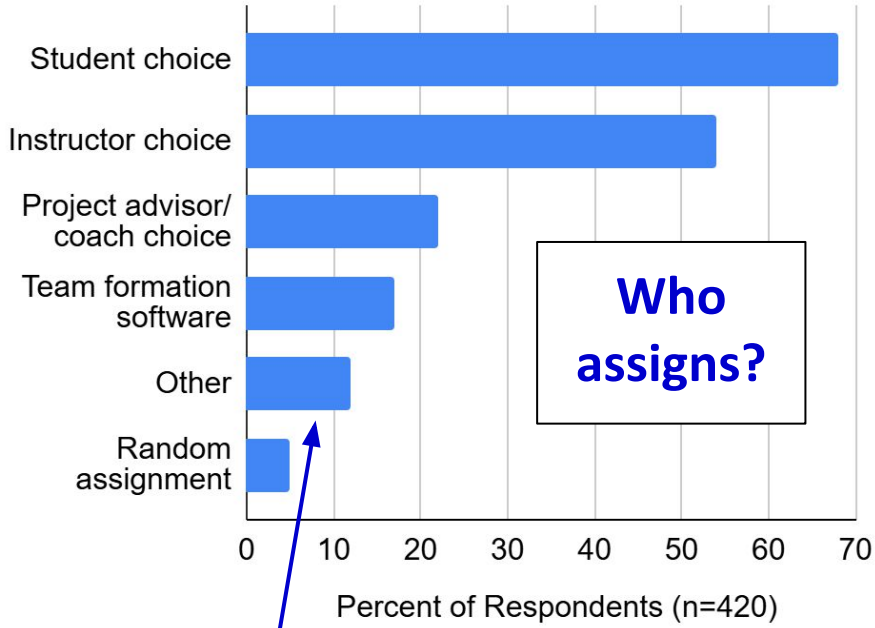
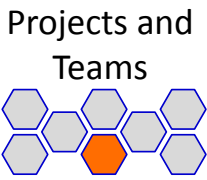


n=412

- Categories represent average number of students per team
- #s in brackets show [min,max] reported within category
- 80% of respondents have 3-5 students/team

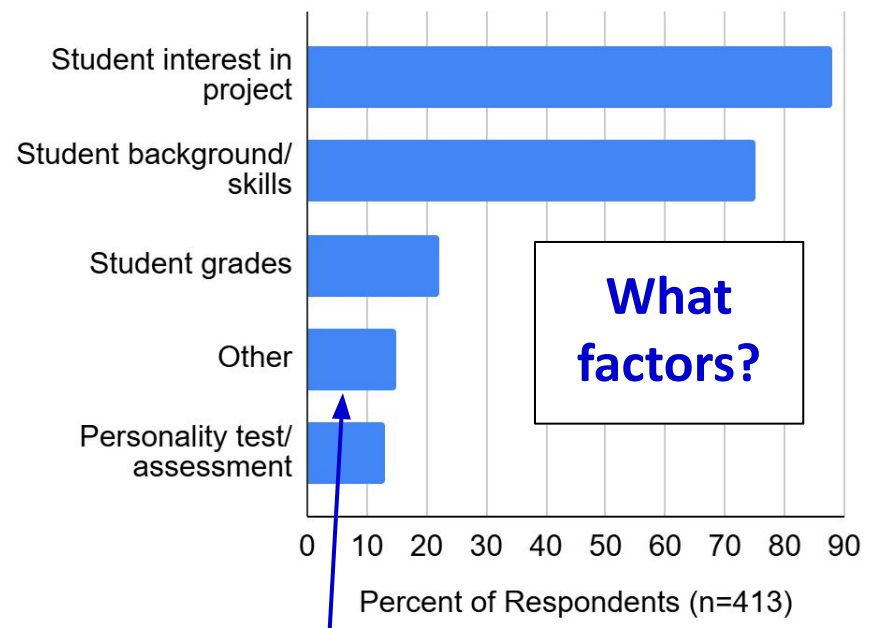


Assigning Students to Teams

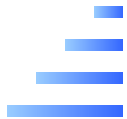


Common "Other": multi-stage process with student input followed by faculty decision

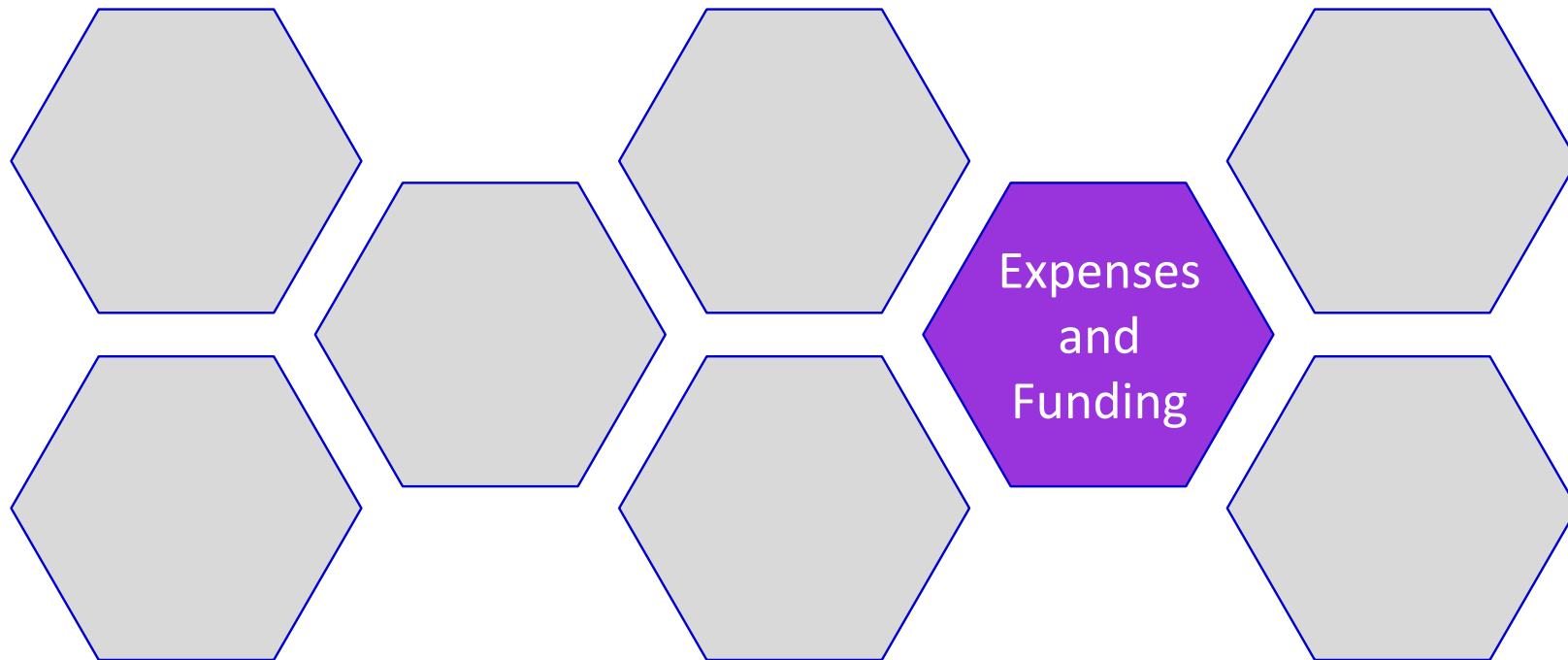
- **Student** choice, interest, and skills are most important



"Other" = student availability, peer pref., demographics, sponsor input

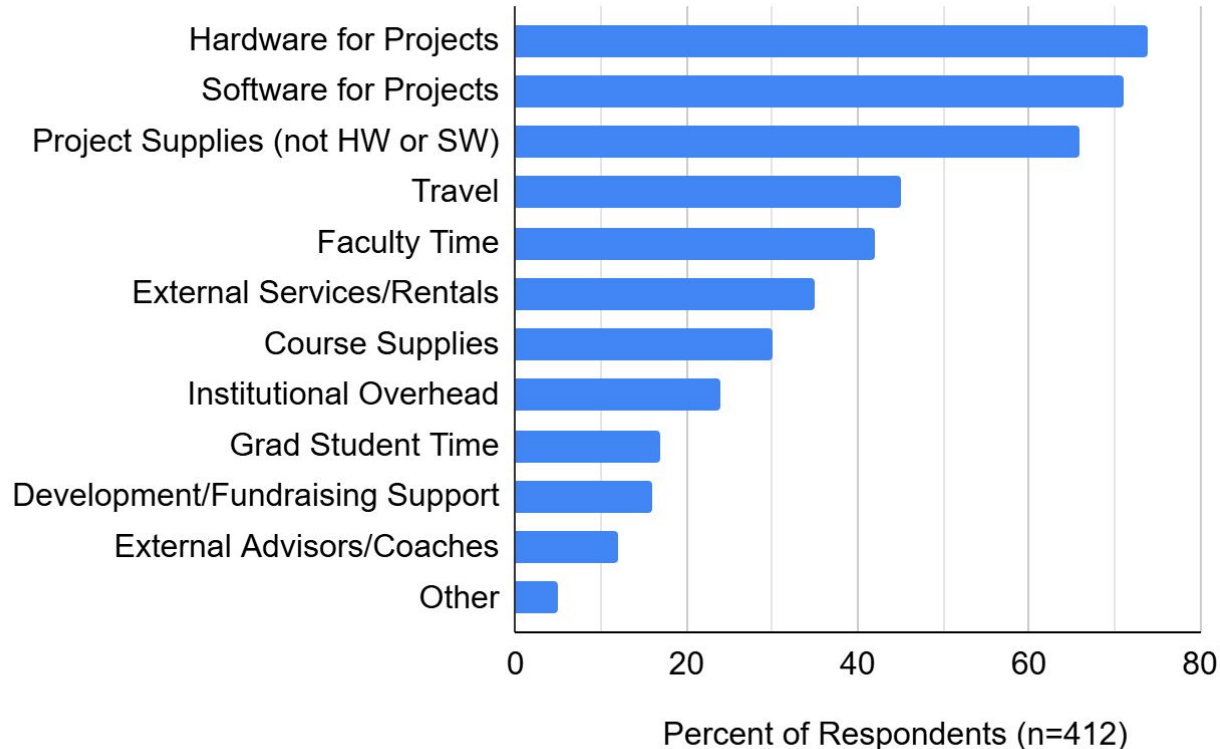


Expenses



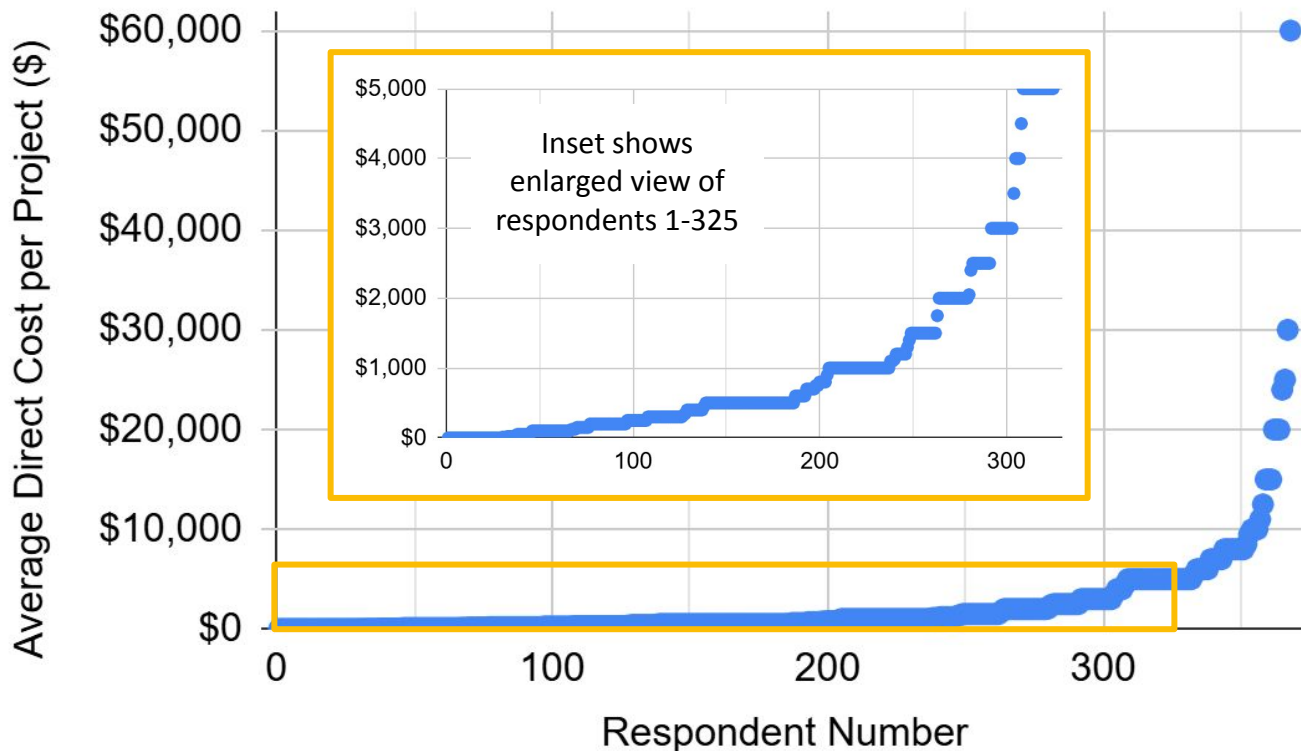


Types of Capstone Expenses



- Project hardware, software, and other supplies are most common expenses
- "Other" = competition fees, staff/technicians, machining time, food, parking

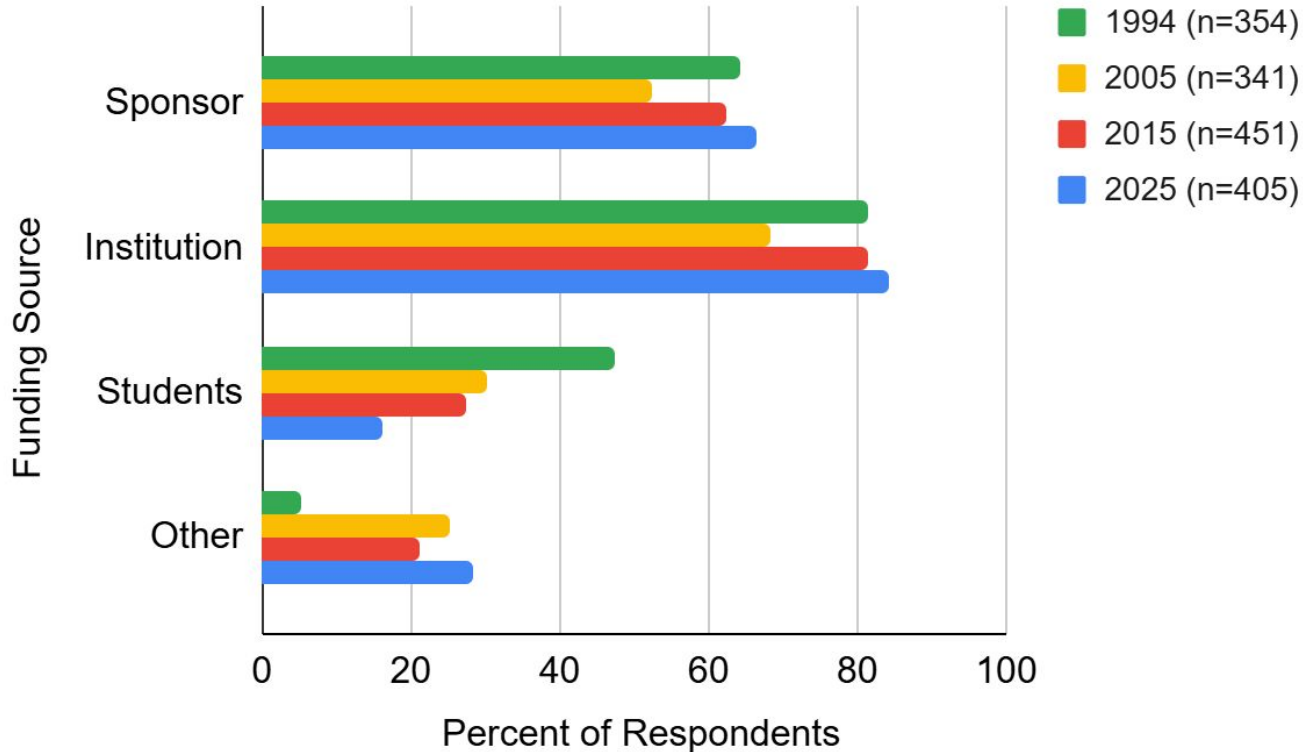
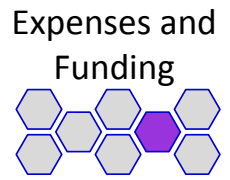
Direct Costs per Project



- Each data point represents one respondent (n=368)
- Max average direct cost = \$60k, but most are much less (median = \$500)
- 84% are < \$5k
- 55% are < \$1k
- 8% have no costs
- only 4% are ≥ \$10k

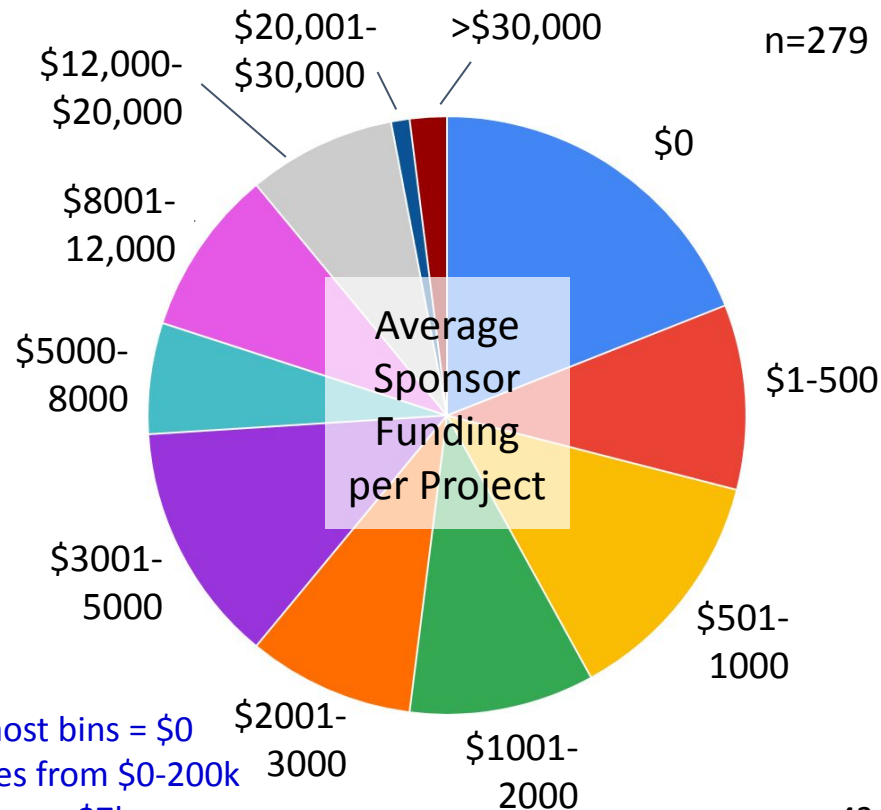
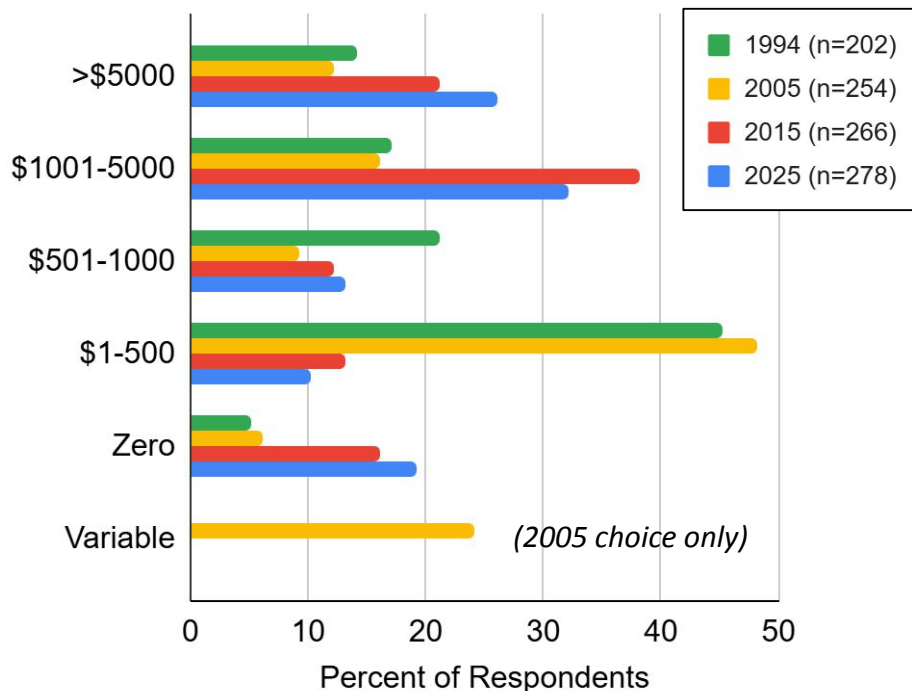


Project Funding Sources



- Institution and sponsors are primary funding sources
- Students are increasingly less likely to fund projects
- "Other" = faculty or instructor, endowed funds, and clients

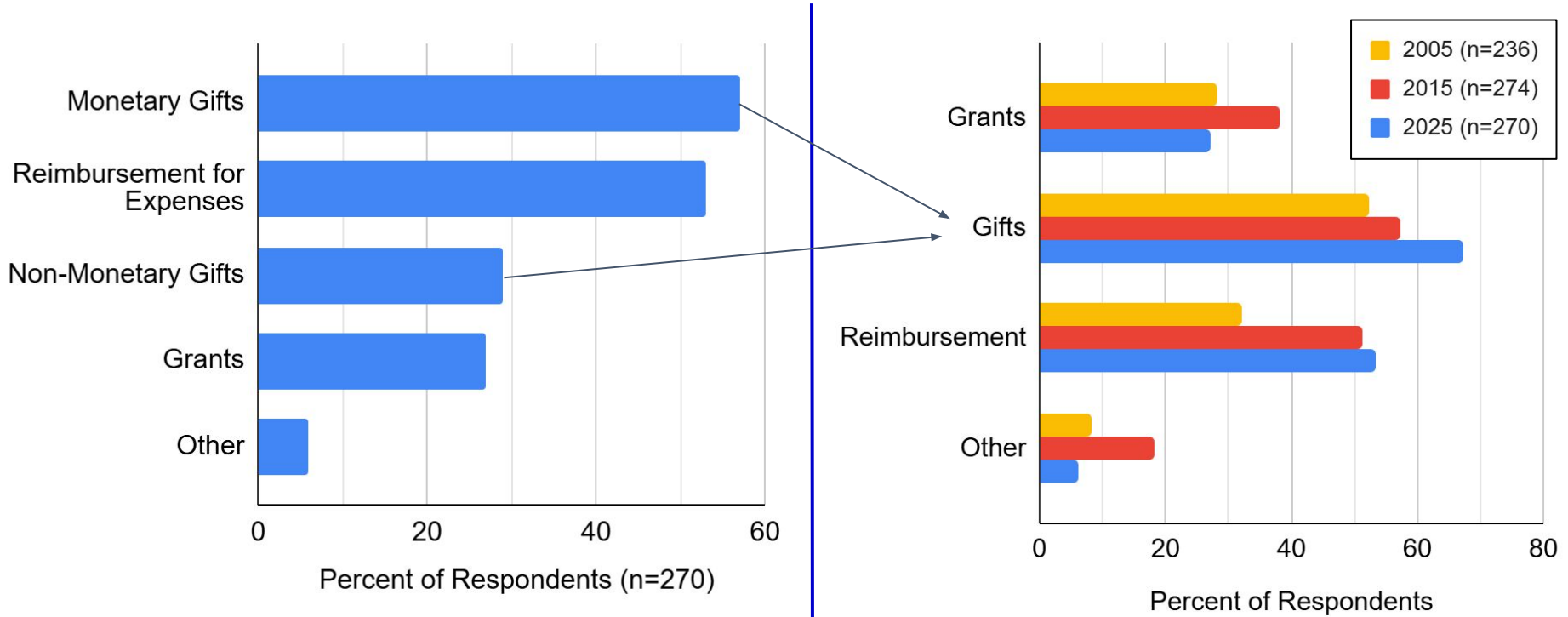
External Sponsor Funding



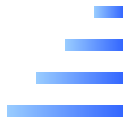
- More sponsors are paying >\$5000
- Zero funding is not uncommon

Min for most bins = \$0
 Max ranges from \$0-200k
 Median max = \$7k

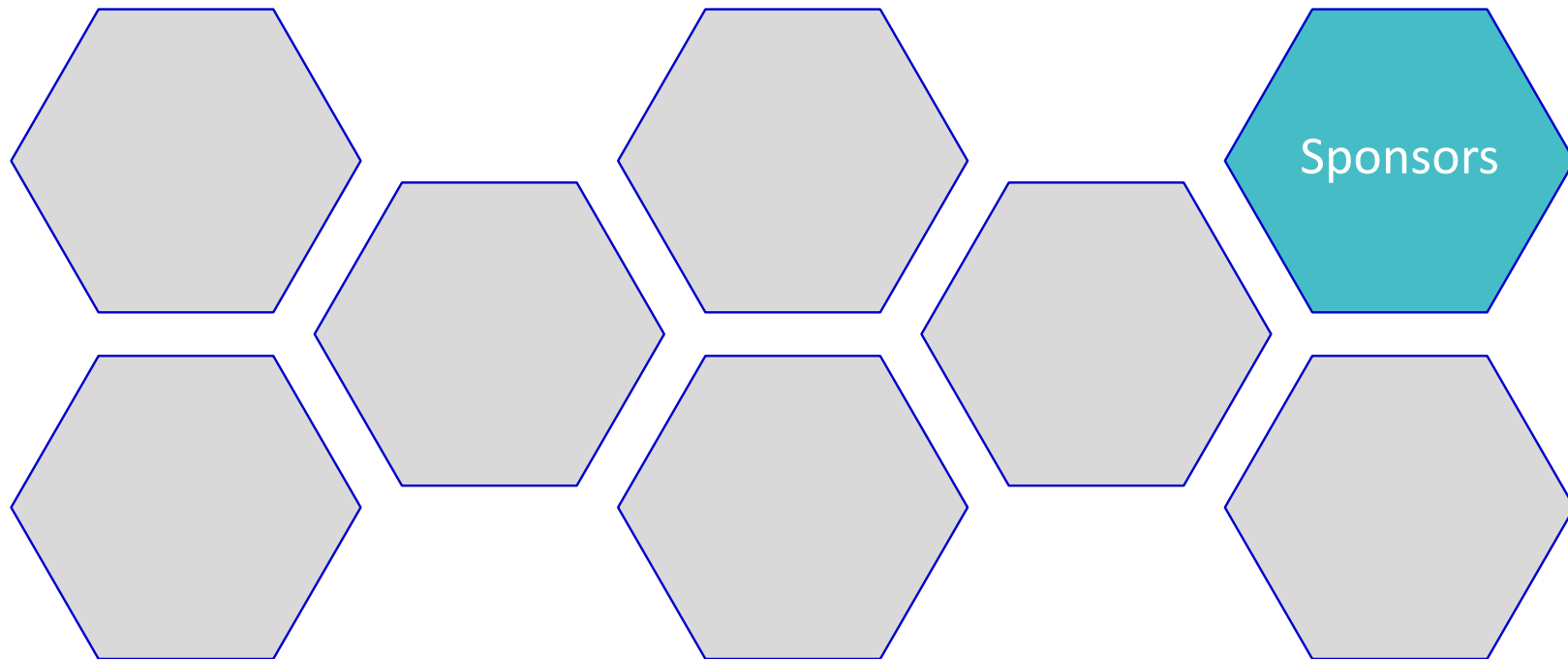
Forms of Sponsor Funding



● **Gifts** and **reimbursement** are currently and historically the most common funding forms

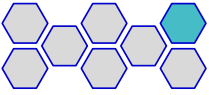


Sponsors



Capstone Sponsor Location

Sponsors



Percent of Respondents

1994
(n=202)



2005
(n=235)



2015
(n=293)



2025
(n=310)



Locally
(<20 miles)

Regionally
(20-100 miles)

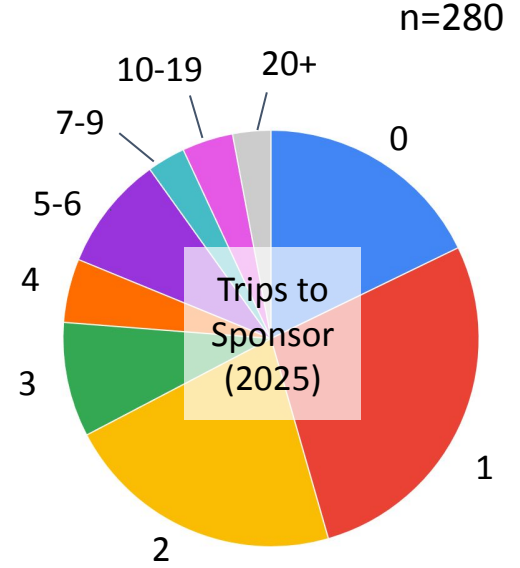
Nationally
(>100 miles)

Internationally
(not a choice in 1994 or 2005)

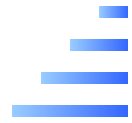
- Local sponsors remained the most common and growing
- Mix of locations is also common

● 13

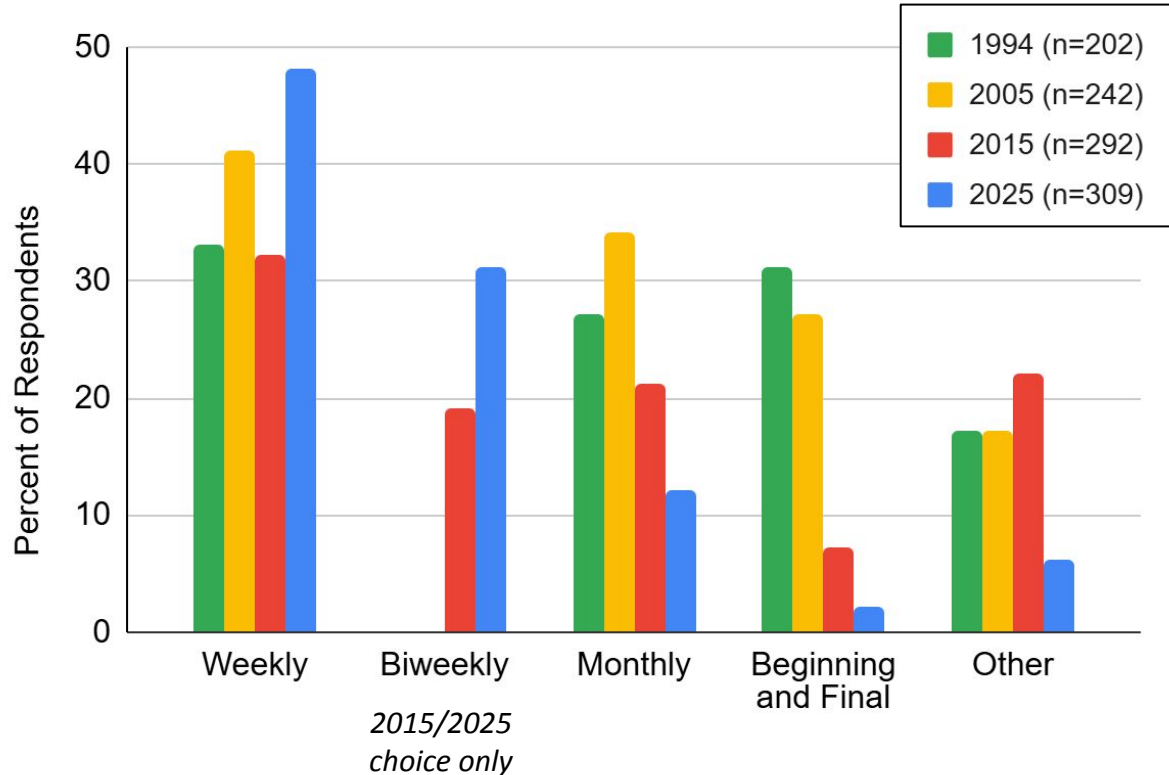
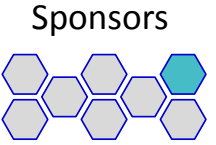
● 16



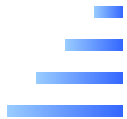
Median = 2 trips
Mean = 3.1 trips



Contact with Capstone Sponsor

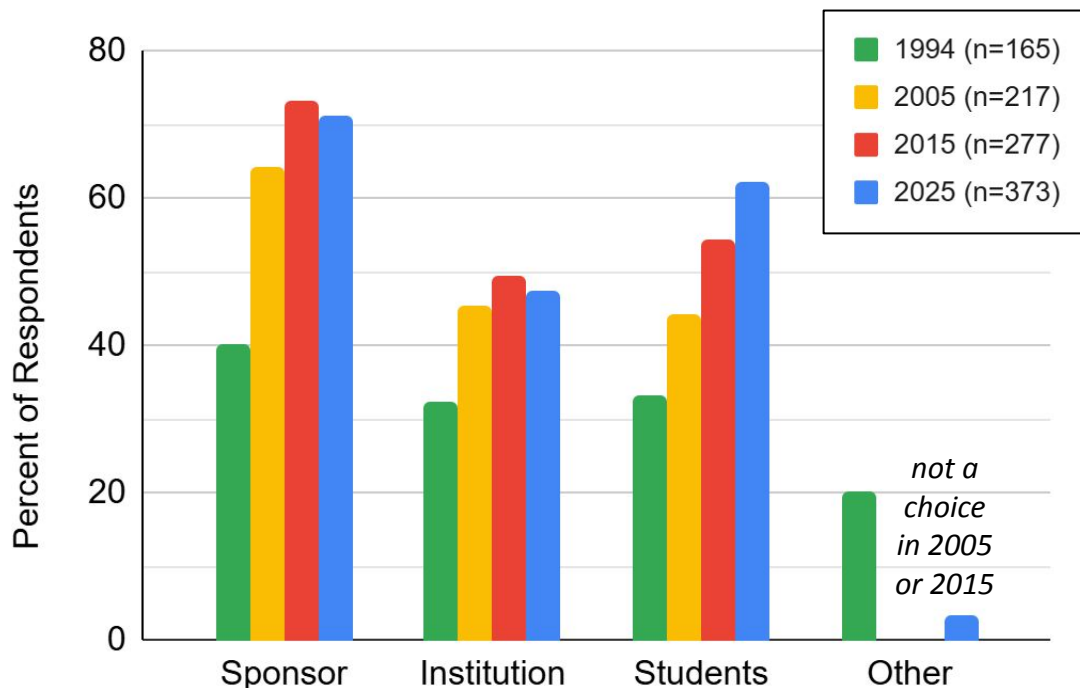
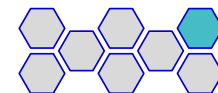


- Weekly contact with sponsors still most common
- Increasing frequency over time
- "Other": most noted that contact varies depending on project, sponsor, and team



Intellectual Property Ownership

Sponsors



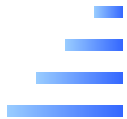
- IP is commonly owned by the sponsor
- Student ownership is increasingly likely too

2025 Q: How is **IP divided?**
(open response, n=166)

60% = defined process
15% = depends on project
23% = don't know, N/A

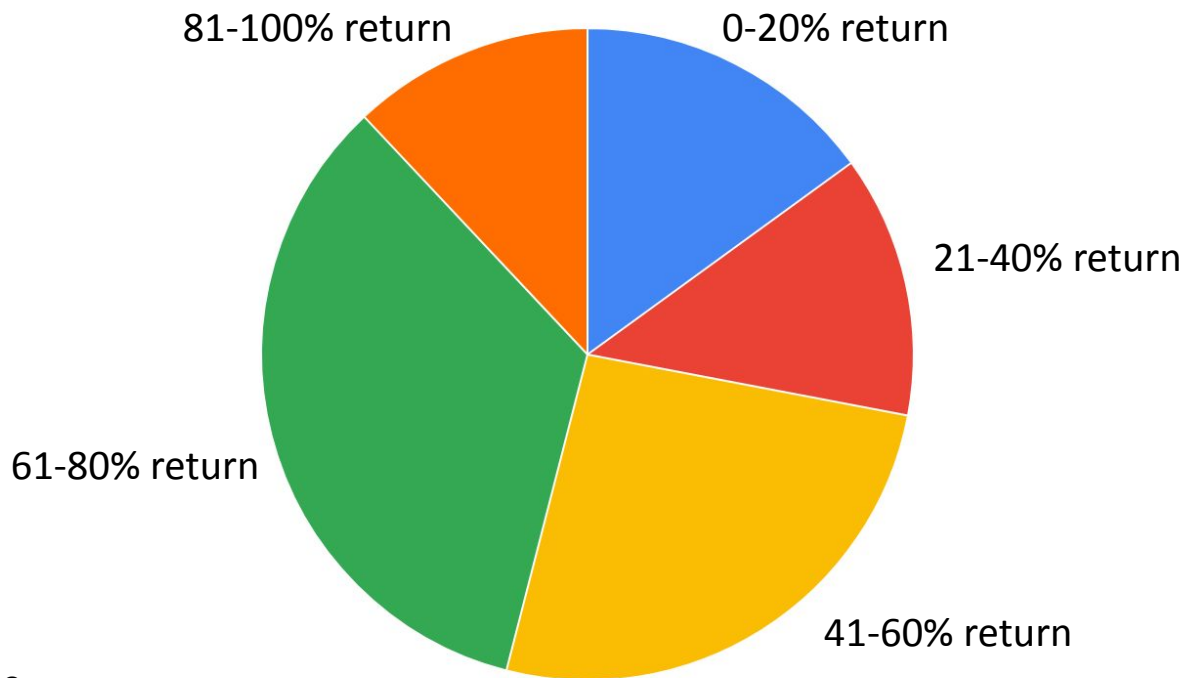
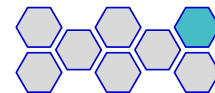
2025 Q: Do any sponsors
require your students to
sign an NDA? (n=308)

79% = Yes



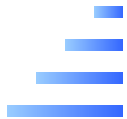
Return Sponsors

Sponsors

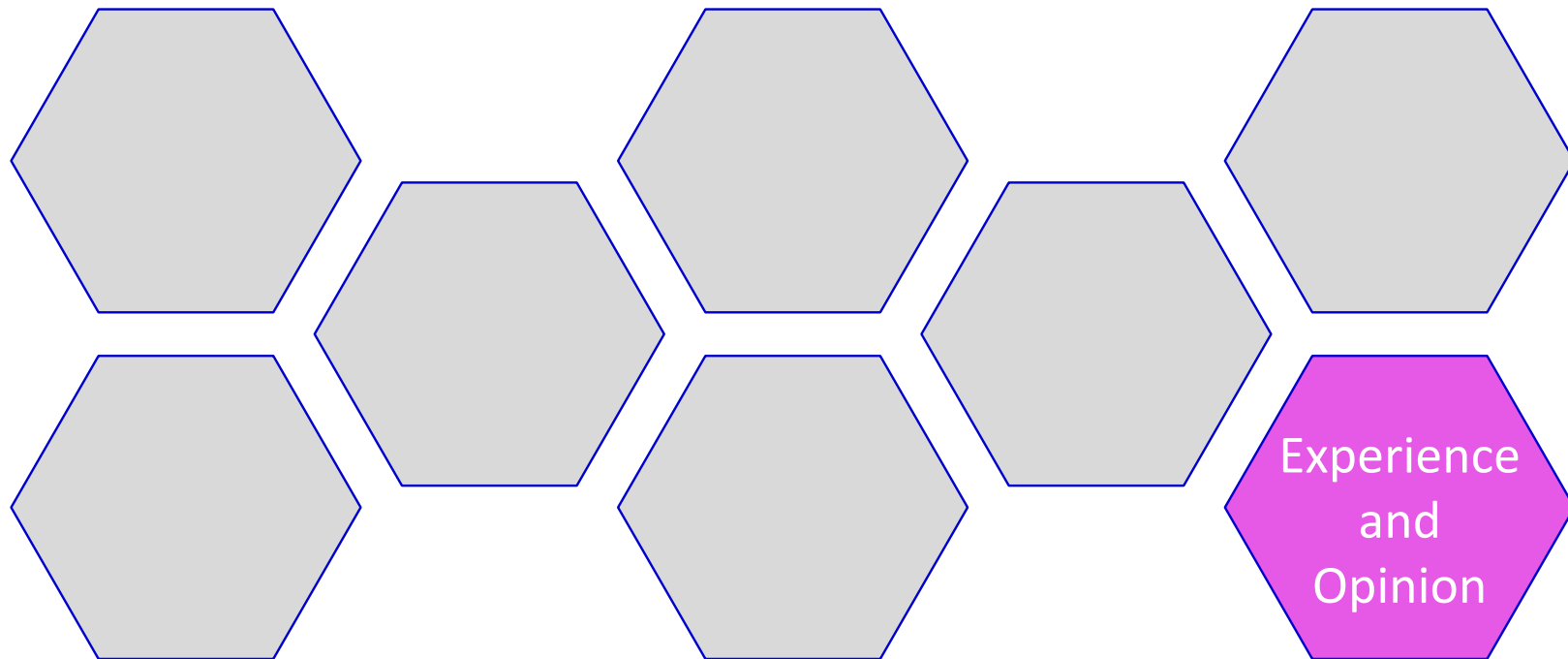


n=270

- "Return" = repeat, follow-on, or new project with same sponsor
- Return sponsorship is common for at least some, if not all, sponsors

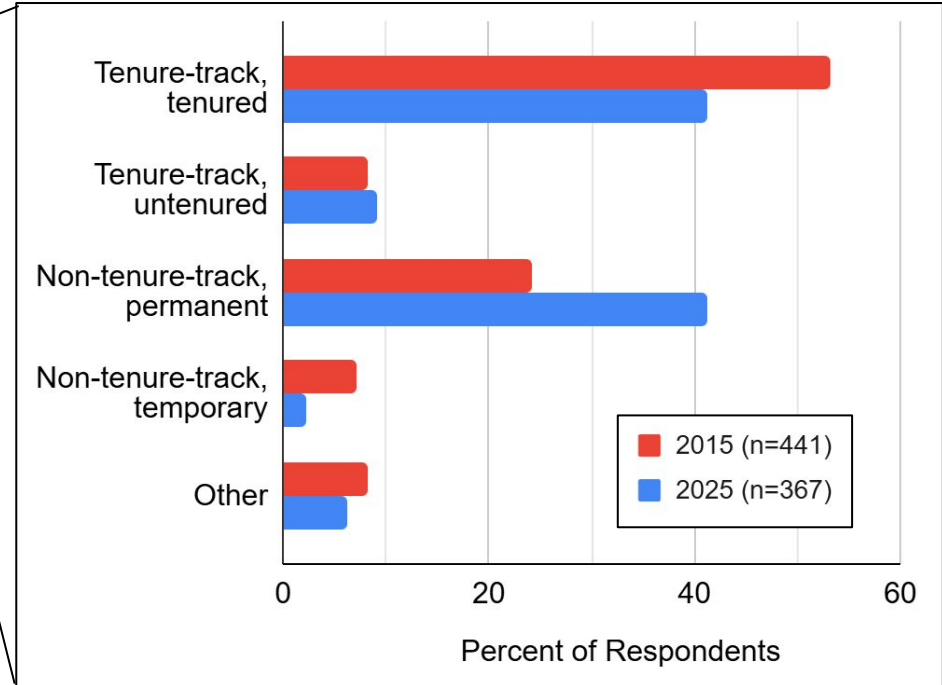
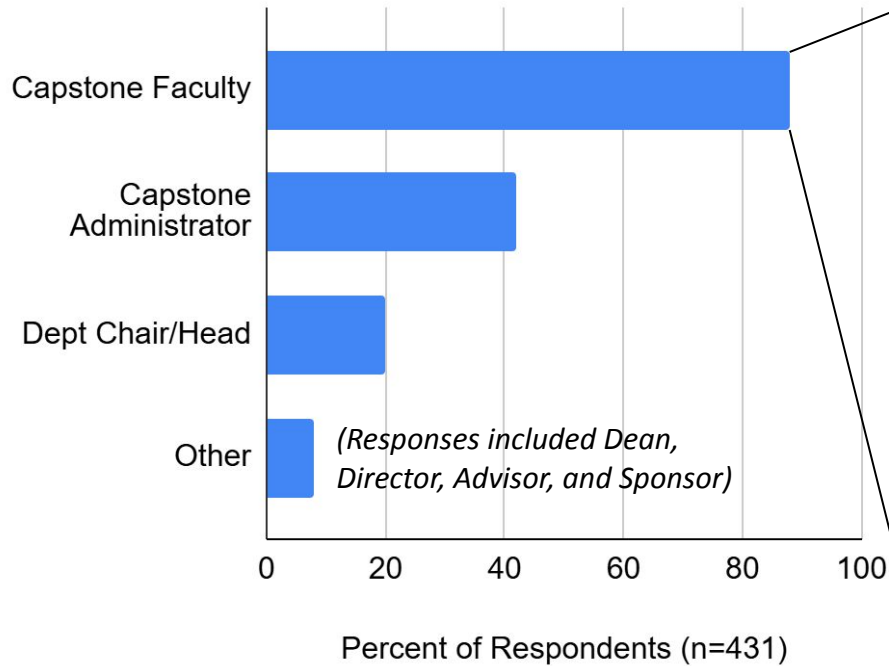


Experience and Opinion





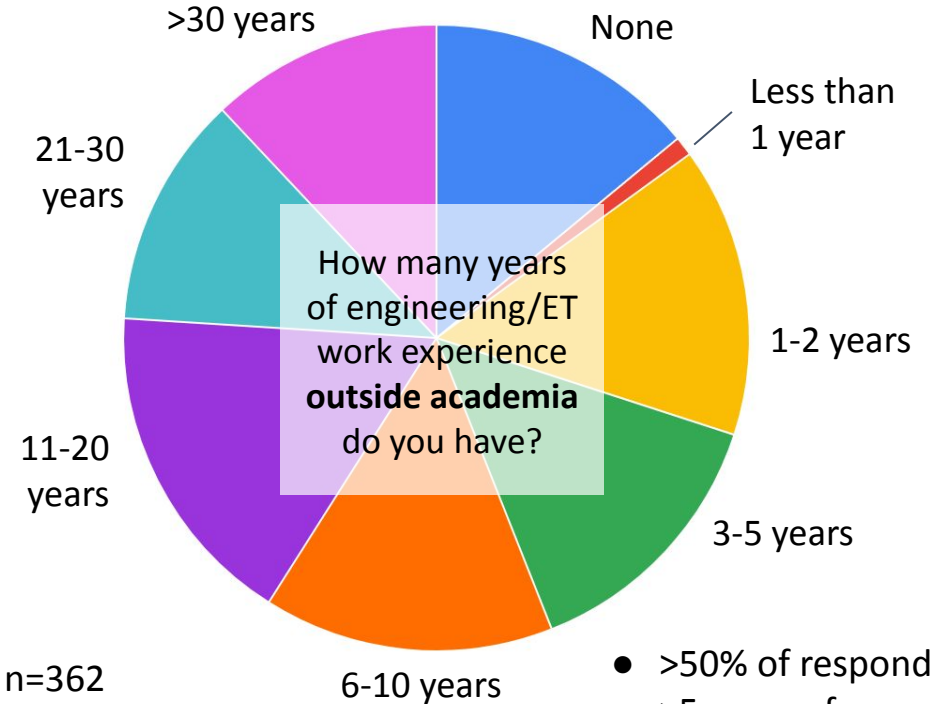
Capstone Role



- Most respondents are capstone faculty and/or capstone administrators

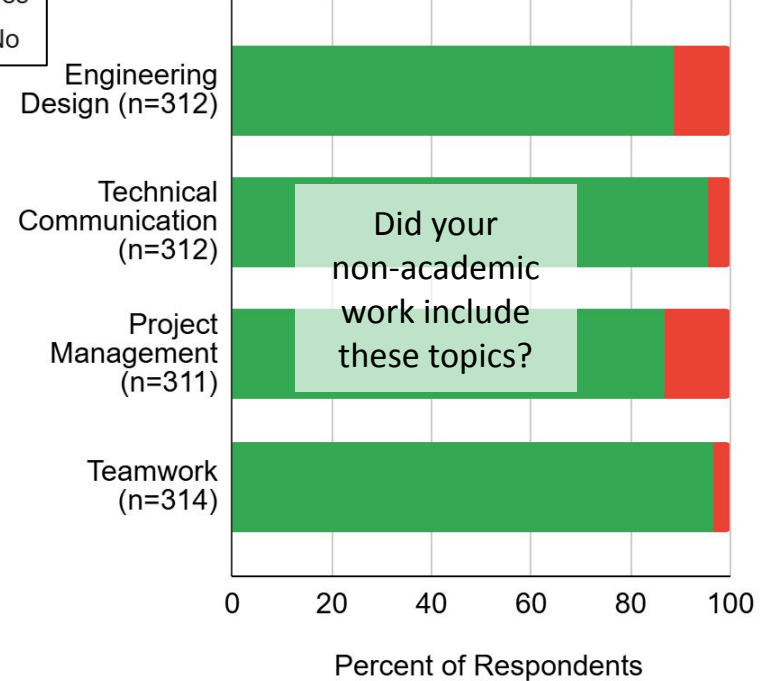
- Decrease in tenured faculty teaching capstone
- Increase in renewable non-tenure-track faculty

non-Academic Experience



n=362

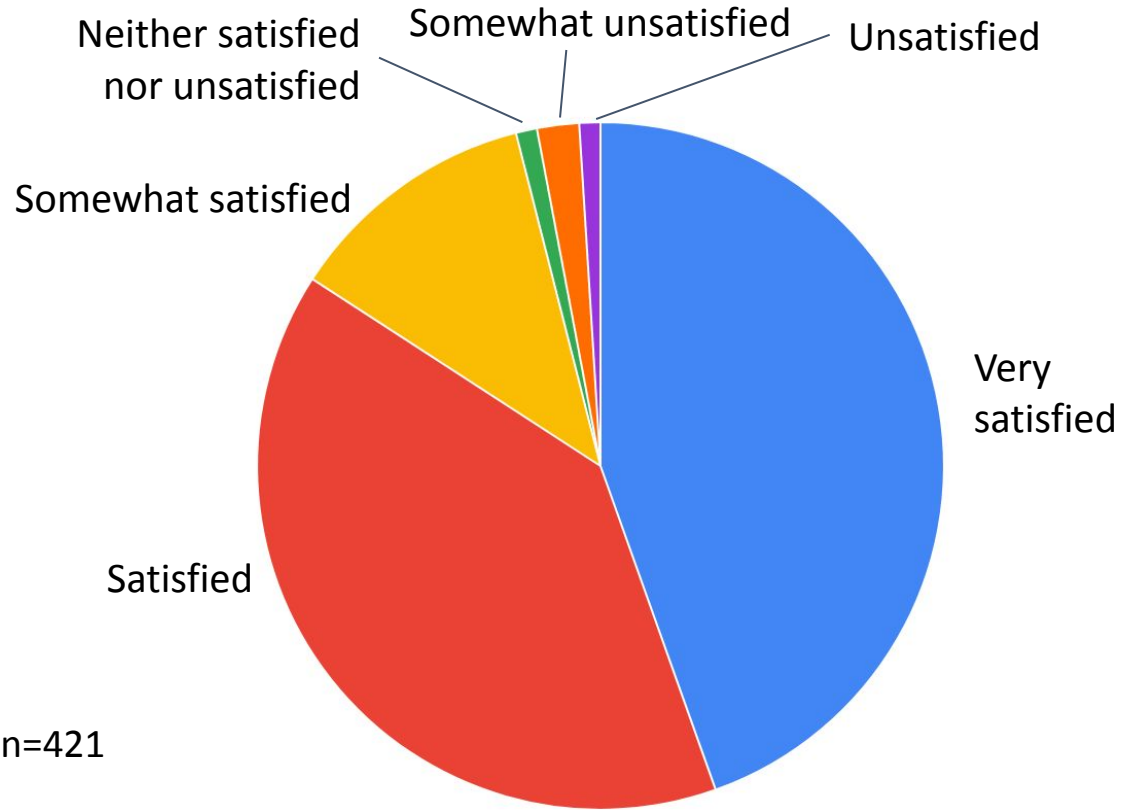
- >50% of respondents have >5 years of non-academic work experience



- Non-academic work supports capstone



Overall Satisfaction



- 85% of respondents are either satisfied or very satisfied
- No respondent selected "very unsatisfied"

It's so real and practical. Almost every single graduate will use the information in their career. It's very rewarding.



Biggest Challenges?

- Workload/Time**
- Student Involvement**
- Project-Related**
- Industry Involvement
- Student Teams
- No Support
- Course Logistics
- Student Preparation
- Evaluation
- Meeting Expectations
- Variety/Breadth
- Miscellaneous
- Faculty Involvement
- Real World

We have a 1 semester capstone, so some teams don't have quite enough time to build, and others don't have enough time to test.

We need a better way to scale up. Right now, there are too many teams assigned to one faculty.

Getting all team members to be fully engaged.

Trying to make sure students don't wait until the last minute to accomplish tasks.

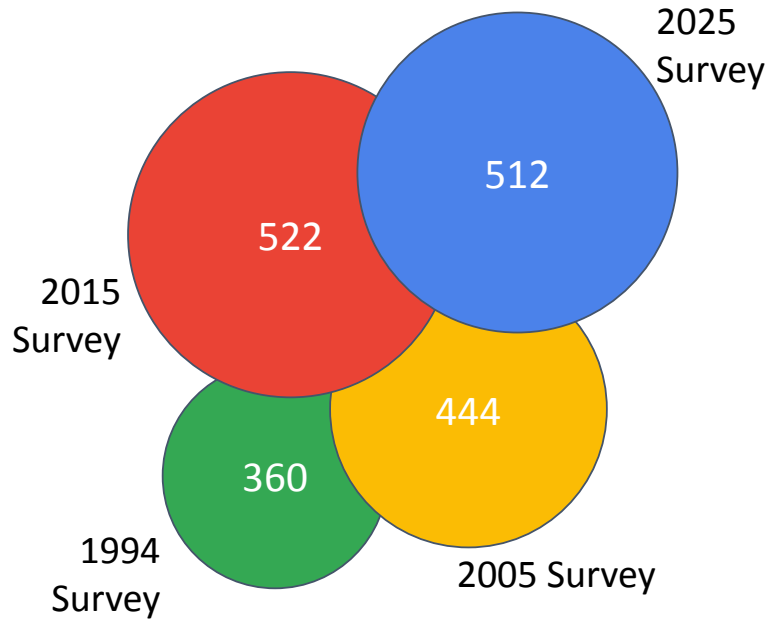
Finding / developing meaningful projects that encompass the totality of the student learning experience.

Getting companies to sponsor projects. ... We are always under pressure to raise enough sponsorships to meet program expenses.

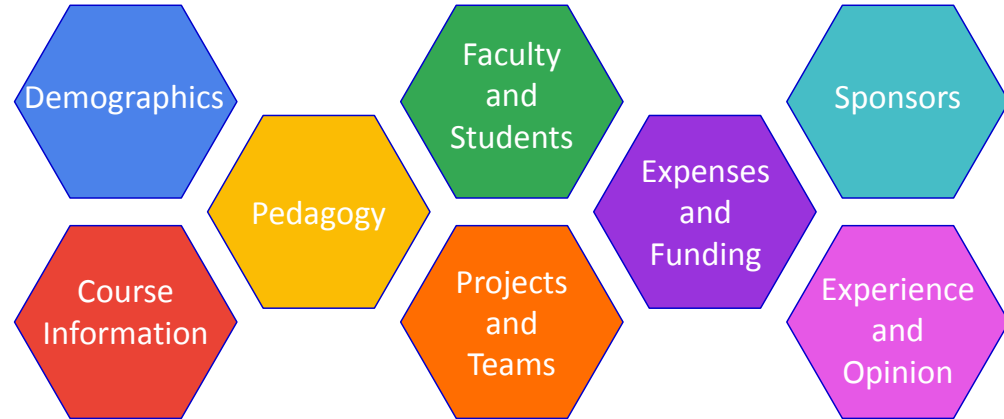


Summary

Data Sources



Survey Results



many patterns, much variety



Future Work

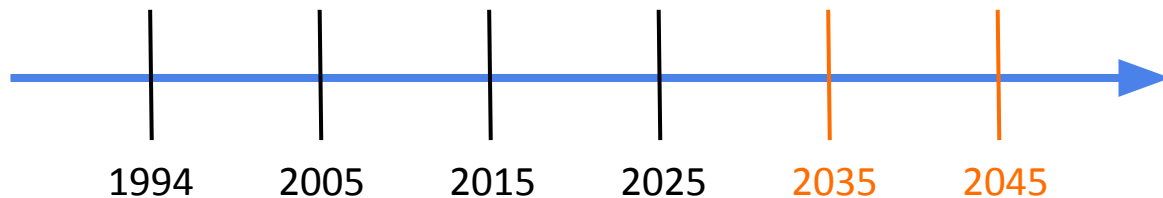
Upcoming Papers

- ASEE 2026 - qualitative data
- ET-specific data
- Pedagogy deep dive
- Expanded keynote

Potential Future Topics

- Student/alum perspective
- Sponsor feedback
- Connection to outcomes
- **What do you want to know?**

Decennial Surveys





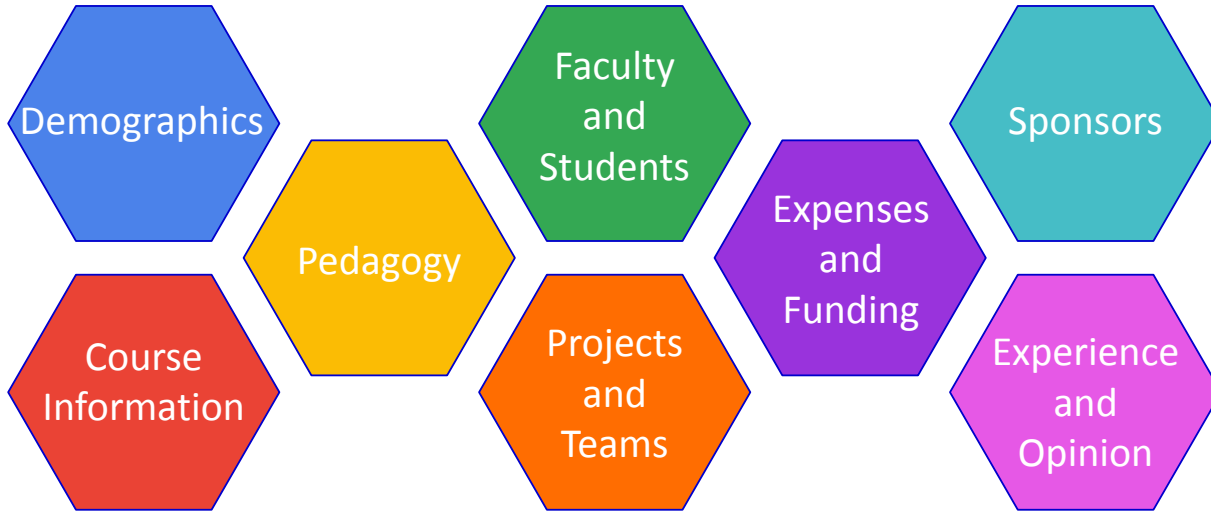
Acknowledgements:

Beth DeBartolo (RIT), John Estell (Ohio Northern), Jay Goldberg (Marquette), Kris Jaeger-Helton (Northeastern), Gordon Krauss (Harvey Mudd), Eli Patten (UWashington), Marie Parette (Virginia Tech), Robert Weissbach (Purdue), and all the 2025 survey respondents!



The 2025 Capstone Survey

Current Practices and Trends over Time



Susannah Howe
showe@smith.edu

Rustin Webster
rwebste@purdue.edu

Matthew Turner
MattTurner@purdue.edu