Michigan State University
2015 Undergraduate Research Survey

Introduction

I am pleased to share the results of the 2015 Michigan State University (MSU) Undergraduate Research Survey. The survey is administered every other year to students participating in different undergraduate research programs and experiences at MSU. The purpose of the survey is to help the University better understand student perceptions of their undergraduate research experiences relating to perceived learning outcomes, interactions with research mentors, and general logistics of their opportunities.

Survey Administration

The survey was administered in April 2015 at the University Undergraduate Research and Arts Forum (UURAF) via electronic tablets; we also distributed cards with the survey's web address to UURAF participants. For three additional weeks after UURAF, emails were sent out to all UURAF participants, Provost's Undergraduate Research recipients, and first- and second year Honors College students who were either Professorial Assistants (PAs) or enrolled in the Honors College research seminars.

Surveys were emailed to 1,211 students. Students who completed the survey received a voucher for a free scoop of ice cream at the MSU Dairy Store. Approximately 953 students returned surveys, which represents a 79% return rate. However, 35% of the returned surveys were partially completed, as not all questions were required. Accordingly, some findings will have different total numbers of participants, because some students elected to skip questions.

This report contains six sections.

- Part I: Who is engaging in undergraduate research (UR)
- Part II: Features of UR experiences
- Part III: Research skills
- Part IV: Professional development skills
- Part V: Academic-undergraduate research connections
- Part VI: Mentoring

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Part I: Who are our Undergraduate Researchers?

Gender & Race/Ethnicity

More undergraduate women (66%) than men participated in the survey. Approximately 81% of respondents were White students, while the two largest minority groups were Asian/Pacific Islanders (6.4%) and Black/African American students (2.4%). The majority versus minority student ratios were similar to the 2013-14 MSU Diversity & Inclusion Summary. American Indian/Alaskan Natives and Asian/Pacific Islanders participated at higher rates, while Black/African American students participated at lower rates compared to general university enrollment patterns.

Residency

A majority of participants (82%) were Michigan residents, while 18% were from out of state. Nearly all respondents were domestic students (97.2%), while 2.7% were international students.

Class & Honors Affiliation

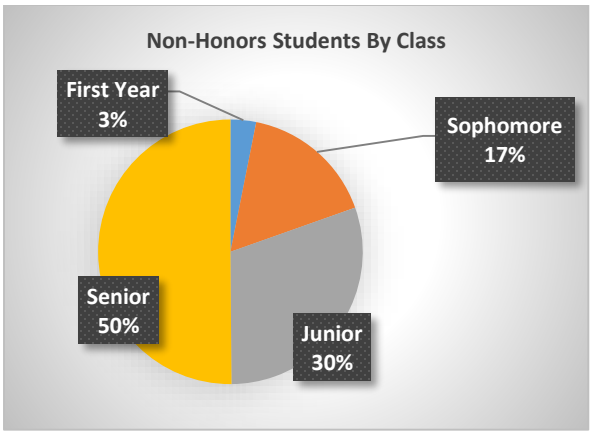
The respondents were equally divided between class levels with 47.2% being underclass students (i.e., first-year and sophomore) and 51.8% representing upper-class students (i.e., juniors and seniors). Approximately 41% of respondents were affiliated with the Honors College. In general, a larger percentage of underclass students were affiliated with the Honors College, which can be attributed to the Professorial Assistant Program and the Honors Research Seminars.

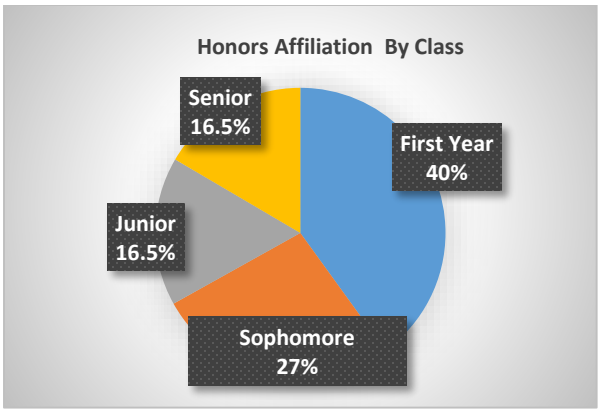
However, more upper-class students were not affiliated with the Honors College. This trend seems to support the observation that honors students have more opportunities to engage in research earlier, while students not affiliated with the Honors College engage in research later, often when they reach upper-class status and enroll in major-specific courses.

Gender	Percentage
Female	66.0%
Male	34.0%

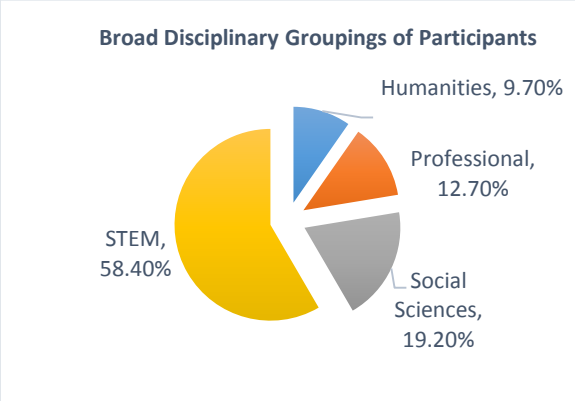
Ethnicity	Percentage (Frequency)
American Indian/Alaskan Native	0.30% (3)
Asian/Pacific Islander	6.40%(61)
Black/African American	2.40% (23)
Caucasian	81.00% (773)
Hispanic Ethnicity	2.50% (24)
International	2.70% (26)
Not Reported	0.80% (8)
Two or more races (non-Hispanic)	2.90% (28)
Missing	0.80% (8)

Class Level	Percentage (Frequency)
First Year Student	25.1% (237)
Sophomore	22.6% (214)
Junior	22.1% (209)
Senior	30.2 % (285)





Undergraduate research and creative activity experiences are offered across the 14 colleges that award undergraduate degrees. Close to 60% of these opportunities were in STEM fields, while nearly 20% were in the social sciences, and the remaining 20% was divided between humanities and professional studies (i.e., business, nursing, education). This figure is based off each participant's primary college; we acknowledge that students sometimes work with a research mentor outside of their college, but most undergraduate students work with mentors in their college or in a closely related field.



First Generation & Transfer Students

Approximately 16.4% of survey respondents were first generation college students. Nearly all the students began college at MSU, as only 4.3% were transfer students.

GPA

The average cumulative GPA for the entire sample was 3.63 (SD =.13). For non-honor students, the average cumulative GPA was 3.42 (SD = .41).

Part 2: Logistics of Research

Time on Task

For many students, their undergraduate research position is their part time job. During the fall and spring semesters, the hours spent on their UR positions varies, with about 41% of students spending seven hours or less weekly on their research and 47% spending eight hours or more on their research. A majority of students (45.2%) had spent at least 2 semesters on their current research project. On average, students spent 2.36 semesters on their current research/creative project, and 3.18 semesters working on any undergraduate research or creative work.

Stipends

Stipends vary across the colleges. During the academic year, the lowest stipend was $261/semester and the highest was $2000/semester. The average stipend for students was $806/semester. This figure has dropped from recent years, when the average stipend/semester was around $1000/semester or $10/hour. Students also may volunteer or earn credit for their research experiences.

Summer stipends were significantly higher, with the average summer 2015 stipend being $3,174. The lowest summer stipend was $550 and the highest was $4,400. Engineering students were paid the highest in summer research programs. In STEM fields, the average summer research stipend ranges between $3,000 to $4,000 for a 10-week summer program working near 40 hours/week.

Hours/ Week	Percentage (Frequency)
0 hours	6.8% (65)
1-4 hours	17.4% (166)
5-7 hours	16.9% (161)
8-10 hours	30.1% (287)
11+ hours	16.4% (156)
No response	12.5% (119)

Number semesters	Percentage (Frequency)
0 semesters	4.2% (40)
1 semesters	14.7% (140)
2 semesters	45.2% (431)
3-5 semesters	19.2% (183)
6-15 semesters	4.1% (40)
No response	12.6% (120)

Part 3: Research Skills

Research projects have multiple stages, ranging from developing a research question, designing a study, conducting literature reviews, and collecting and analyzing data. In general, students agreed or strongly agreed that they participated in multiple facets of their research projects. The two areas that had the lowest levels of agreement were "I helped developed a research question" and "I helped design a research study." Many undergraduate researchers usually work on smaller portions of a research mentor's project, so they may not have participated in framing a question or designing a study.

Statement	Strongly Disagree/Disagree	Neither Agree nor Disagree	Agree/Strongly Agree
I developed or helped developed a research question	21.0% (171)	17.8% (145)	61.2% (500)
I designed or helped design a research study	22.5% (183)	16.3% (132)	61.2% (497)
I have read scholarly literature related to my research area	6.5% (53)	6.4% (52)	87.1% (709)
I have used skills/techniques necessary to conduct research in my chosen area	4.9% (40)	9.3% (76)	85.7% (698)
I produced data/materials for analysis	7.9% (64)	9.2% (75)	82.9% (676)
I analyzed data/materials to answer a research question	7.7% (63)	11.7% (95)	80.6% (655)
I interpreted results/advanced an argument based on the analysis of data/materials	9.6% (78)	13.5% (110)	76.8% (624)
I have developed the ability to independently conduct research/scholarship in my discipline	10.3% (84)	17.0% (138)	72.7% (591)

*missing data removed

Part 4: Professional Skills

Beyond learning skills specific to a disciplinary area, undergraduate researchers gain a variety of professional skills, such as teamwork, communication, and problem solving that are useful in school and in the workplace. The two professional skills with the highest level of agreement were "I improved my ability to work independently" and "I improved my ability to communicate effectively with others." Four areas—solving problems, working effectively with others, establishing professional networks, and speaking or presenting in front of others all scored in the next highest tier. The professional skill that scored the lowest was "improving writing skills". This lower score might be related to the amount of time students are engaged in their research projects. In this study, 73.4% of students spent 2 or less semesters on their research, while 26.6% spent 3 or more semesters. The longer students engage in a research project, the more deeply involved they become in the project. Many undergraduate researchers simply may not be in school long enough to participate in writing publications.

Question:	Strongly Disagree/Disagree	Neither Agree nor Disagree	Agree/Strongly Agree
I have improved my ability to work effectively with others	3.5% (28)	15.1% (122)	81.4% (656)
I have improved my ability to work independently	1.7% (14)	9.0% (73)	89.2% (720)
I have improved my ability to communicate effectively with others	2.9% (23)	8.6% (69)	88.6% (713)

I have improved my ability to speak/present in front of a group.	9.6% (77)	14.5% (116)	75.9% (608)
I have improved my writing skills	11.6% (93)	28.0% (225)	60.5% (487)
I have improved my ability to solve problems	3.9% (31)	13.7% (110)	82.5% (663)
I have improved my ability to establish professional networks	7.2% (58)	17.3% (139)	75.5% (608)

*missing data removed

Many students don't realize the transferrable skills acquired through a research or creative experience. It is important to help students reflect on the skills gained and how specific experiences aided in cultivating these valuable professional skills and abilities, such a time management, project organization, and written and oral communication.

Part 5: Academic-Undergraduate Research Connections

A majority of undergraduate research and creative activity opportunities at MSU are co-curricular, meaning that the projects occur outside of class but are likely related to or complement students' majors. When examining how engaging in a research experience influences their academic experiences, a little over half of the participants felt that engaging in research or creative experiences improved their academic performance or improved their understanding of classroom materials. A higher percentage (68%) saw connections between their research and concepts studied in class. A majority of participants (76.6%) understood how their research contributed to their discipline, and 73.6% understood how their research impacted broader society. Lastly, and perhaps most importantly, 76.4% believed they made a positive contribution to their research, which contributes to the high satisfaction rate among MSU undergraduate researchers.

Question:	**Strongly Disagree/Disagree**	**Neither Agree nor Disagree**	**Agree/Strongly Agree**
I have improved my overall academic performance	7.7% (62)	27.2% (218)	65.1% (522)
I better understand my classroom material	8.2% (66)	26.3% (211)	65.4% (524)
I see connection between my research and concepts presented in the classroom	6.0% (48)	13.0% (104)	81.0% (649)
I understand the significance of my research to its academic discipline	2.2% (18)	6.5% (52)	91.3% (731)
I understand how my research impacts broader society	3.4% (27)	8.9% (71)	87.8% (702)
I made a positive contribution to research	1.9% (15)	6.9% (55)	91.2% (729)

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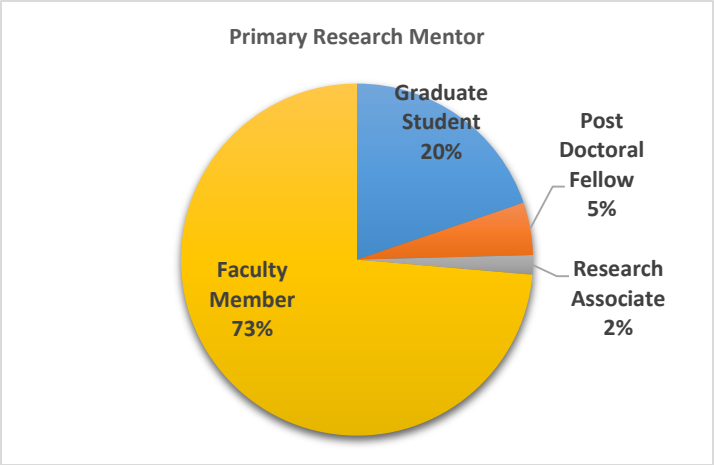
Part 6: Mentoring

Quality mentoring is the most essential component in an undergraduate research experience. Students reported that 73% were mentored by a faculty member, 20% were mentored by a graduate student, and 7% by a research associate or post-doctoral fellow.



The interactions with mentors and other members of the research team (if applicable) affect students' learning and perceptions of their research experiences. In general, MSU undergraduate students are very satisfied with their research mentors and rated mentors high in providing regular, helpful feedback. In addition, approximately 88.3% of students agreed or strongly agreed that their mentors valued students' contributions to the research.

Question	Strongly Disagree/ Disagree	Neither Agree nor Disagree	Agree/Strongly Agree
My mentor checked on me regularly	6.5% (51)	9.2% (72)	84.2% (657)
My mentor provided regular feedback on my work	6.8% (53)	10.3% (80)	82.9% (647)
The feedback I received from my mentor was helpful	3.0% (23)	8.0% (62)	89.0% (690)
My mentor and I discussed my future plans	7.8% (61)	10.8% (84)	81.4% (633)
My mentor valued my contributions to the research	2.4% (19)	9.3% (72)	88.3% (685)
My mentor and I will likely maintain contact beyond the research project	8.9% (69)	14.8% (115)	76.3% (592)

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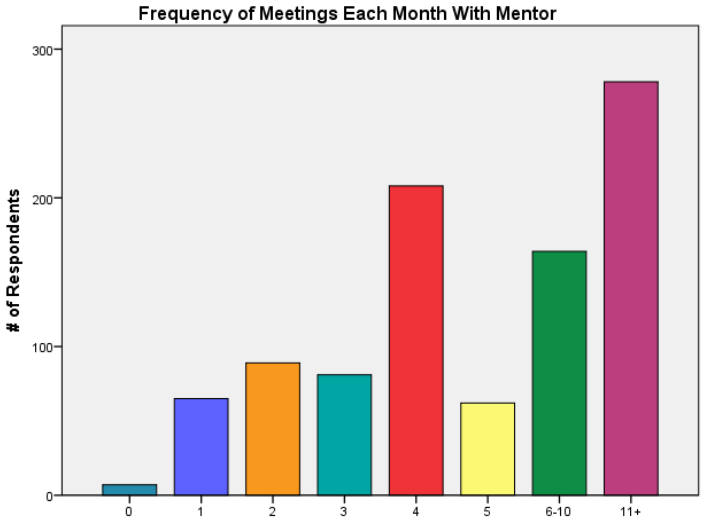
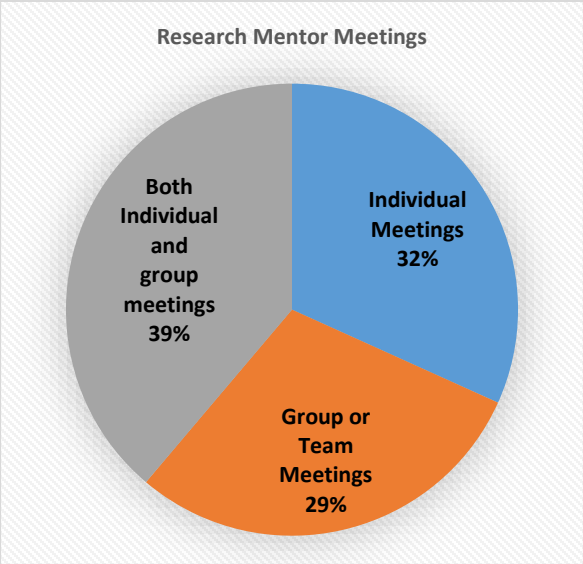
Frequency of Meetings

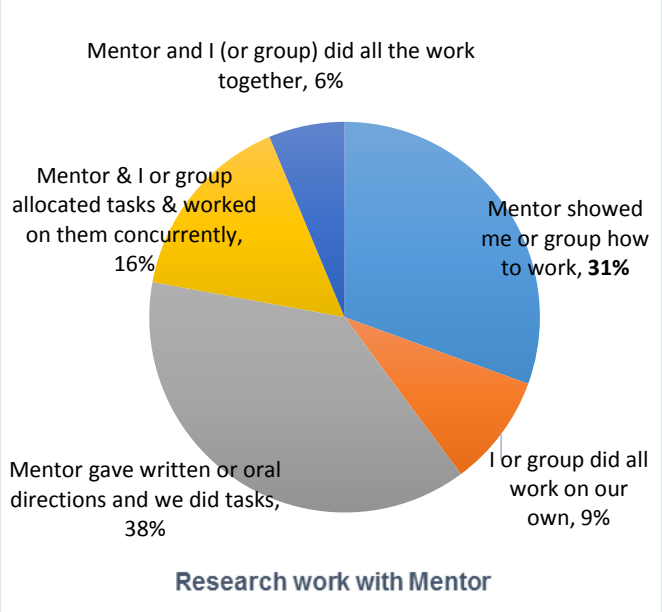
The amount of time research mentors spent with students varied greatly. A majority of students (66%) reported meeting once/week each month, while 21% met 6-10 times/month, and 13% met 11+ times/month. Working on research or a creative activity opportunity is an excellent way for students to make connections with faculty and engage in a deep learning experience.



Meeting Format & Structure

Mentors met with students through individual meetings (32%) and group meetings (29%), with approximately 39% reporting a combination of both.





How research mentors worked and interacted with their students also varied: one-third of mentors showed their students how to do the work, another one-third provided written or oral instruction of how to perform the work, and the remaining either performed the work together, allocated different tasks and performed the work concurrently, or students worked on their own.

Conclusion

A majority (84.1%) of MSU undergraduate researchers were satisfied with their research/creative experiences with 88.4% of survey respondents indicating that their research/creative activity experience positively contributed to their educational experience. Undergraduate research and creative activity experiences afford students an opportunity to deeply engage in their academics while at MSU. Through the process, student researchers develop a wide array of cognitive, academic, and professional skills and build relationships with faculty and other professional networks.

We encourage the university community—especially faculty, academic advisors, and graduate students—to educate undergraduate students about undergraduate research and creative activity opportunities—what it is, how it can benefit students, and, if applicable, their own research experiences. Many MSU undergraduates, especially first- and second-year students, are unaware of research and its potentially powerful impact on their overall academic programs and benefits beyond college.