

Directly From the Source: Faculty Perceptions of Undergraduate Research at the University of Michigan-Flint

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Abstract

This purpose of this study was to assess faculty perceptions of undergraduate research at the University of Michigan-Flint; a midsize Primarily Undergraduate Institution (PUI) located in the Midwest. Mirroring similar studies done at other institutions nationwide, this study examined whether or not faculty at UM-Flint considered their interactions with undergraduate students supportive to their research efforts. Further, this study explored the extent to which faculty believed these experiences facilitated student learning, improved students' cognitive skills, and increased students' academic and research skills. Finally, this study measured both faculty involvement in the University of Michigan-Flint Undergraduate Research Opportunity Program (UROP) and their impressions of the program.

Introduction

The University of Michigan-Flint has historically placed a high premium on the quality of educational services offered to its students. One such measure of educational quality on our campus or *any* college or university is found in the level of research and creative activity conducted by its students. The key features of a quality-rich education include offering students an opportunity to engage in challenging research, real-world application, and academically and professionally enriching experiences.

The University of Michigan-Flint is comprised of four main degree-granting academic units: the College of Arts and Sciences (CAS), the School of Education and Human Services (SEHS), the School of Health Profession Studies (SHPS), and the School of Management (SOM). Over 40 majors are offered in the College of Arts and Sciences with focuses in liberal arts and sciences. The School of Education and Human Services offers programs focusing on Education and Social Work. The School of Health Professions and Studies offers programs leading to undergraduate degrees in Health Care Administration, Health Education, Health Science, Radiation Therapy, Nursing, and Physical Therapy. The School of Management offers a score of business programs including General Business, Accounting, Finance, Operations Management, Organizational Behavior/Human Resources Management, and Marketing.

In addition to offering undergraduate degrees in over 60 areas, there are currently over 150 research-related courses¹ available at the University of Michigan-Flint. This is evidence of the University's commitment to institutionalizing the process of undergraduate research. This has been further underscored by the development of the Undergraduate Research Opportunity Program² (UROP), a centralized student research initiative sponsored by the Office of Research. University of Michigan-Flint's UROP was launched in Winter, 2005 to create partnerships

¹ http://www.umflint.edu/research/research_courses.pdf

² <http://www.umflint.edu/research/UROP>

between faculty researchers and students. Over the years, the program has shown steady growth; reflective of the growing interest in faculty-student research collaboration (Louis, 2008).

Motivation for this Study

Several years ago, Said Shokair, Director of the Undergraduate Research Opportunities Program at the University of California – Irvine, conducted a study involving faculty on his campus. In it, he found that UC-Irvine faculty considered research a critical part of the education undergraduate students received. But his study also noted the many challenges faculty face as they look to sponsor undergraduate student researchers (Shokair, 2002). Lack of time, limited resources, inadequate student preparation, and lack of institutional support were all cited as barriers to creating and sustaining environments for undergraduate research. Those issues notwithstanding, the study revealed that faculty perceived research as a hallmark of the educational experience undergraduate students receive.

For this study, similar questions were raised: *How valuable do faculty perceive undergraduate research to be at the University of Michigan-Flint? Are there identifiable obstacles faculty face as they include students in their projects? Do those obstacles impede their research efforts? Does the time faculty spend with students have an impact (positively or negatively) on their work?*

This study examined the responses to those questions.

Methodology

Partnering with the Office of Extended Learning³, an online survey was launched in the Winter, 2009 semester. The survey was specifically used to measure faculty involvement in UROP, their assessment of the program, their involvement with undergraduate research in a general sense, the affect that involvement had on their work, and their perception of their students' experiences.

At the outset of the survey, faculty were asked if they ever sponsored a UROP project. Faculty responding in the affirmative were then asked a series of questions relative to their experience in UROP particularly in regards to their impressions of the program and outcomes based on their participation. Faculty who did not cite previous experience with UROP were specifically asked to indicate the reason(s) they did not participate.

Upon completing this section, faculty were then asked a series of questions regarding undergraduate research in general. First, the faculty participants were all asked if they ever sponsored undergraduate research in any capacity over the past year. Those who responded in the affirmative were then prompted to answer a series of questions directly related to the types of undergraduate research projects they sponsored, their perceptions of those experiences, and the impact – if any – their experiences had on their work. Faculty who indicated they did not sponsor any undergraduate research we asked to specify the reason(s) they did not participate.

The final question in the survey was in an open-ended format and allowed for the faculty to provide general feedback, comments, and suggestions.

³ <http://www.umflint.edu/oel>

In order to solicit participation, a request was sent to the entire faculty community via email. A link to the online survey was included in the message. As the respondent clicked on the link, the survey opened in a new window. No identifiable information was collected in the survey and all responses were anonymous.

Initially, the survey was active for two weeks. But after generating a low response rate at the time, the survey was extended for an additional two weeks. The respondents were sent a reminder email encouraging them to participate. Regardless of participation, it was communicated to all faculty that this report would be available to anyone interested.

Of a population of 515 faculty⁴, the survey received responses from 91 participants, generating a response rate of 17.7%. While this response was lower than desired, it was adequate enough to perform the intended analysis.

Faculty Sponsorship in Undergraduate Research

While one-on-one interactions that come with undergraduate research are often considered less efficient teaching methods when compared to lecturing a large body of students at once, studies show that faculty are still quick to point out the *effectiveness* of these research experiences with individual students (Kaufman, et. al, 2003). That being said, one portion of the survey focused on faculty support of undergraduate research in general and their perceptions of its effectiveness. Faculty assessments specifically regarding UROP will be examined later in this report.

When asked if they have sponsored⁵ any type of undergraduate research at UM-Flint, 47.3% of faculty answered “Yes.” It was very encouraging to see that close to half of all faculty interviewed have sponsored undergraduate research during their professional and academic career.

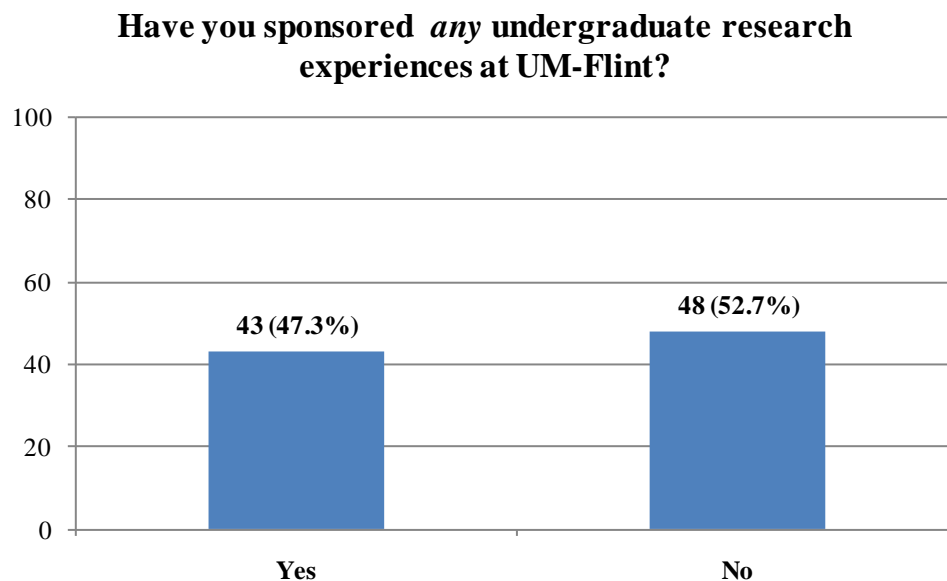


Figure 1: Faculty sponsorship in undergraduate research

⁴ Figure provided by Dee Dee Hurley from University Human Resources

⁵ In this study, faculty “sponsorship” was defined as any “...experiences include serving as a principal investigator on a project with student assistants and/or advising undergraduate students on their own research projects.”

Types of Undergraduate Research Projects Supported

When asked what types of undergraduate research projects were sponsored by faculty (allowing respondents to choose any options that applied), the following responses were recorded:

	Frequency of Responses ⁶
Independent study	27
Thesis work	23
Literature review project	22
Directed readings project	15
Quantitative data analysis project	13
Field work	12
Laboratory work project	10
Qualitative data analysis project	10
Transcription project	9
Other projects	6
Clinical experiments/observation project	3
Program design/evaluation project	2

Figure 2: Type of undergraduate research projects sponsored by faculty

“Other projects” on which faculty have served as sponsors include:

- Capstone course work (1)
- Co-authored publication (1)
- Evaluation research proposal (1)
- Data entry project (1)
- Biology department credit work (1)
- Theoretical experimentation, conjecture, proofs (1)

⁶ Based on the 43 respondents who indicated they sponsored undergraduate research.

Amount of Faculty Sponsorship Provided to Students

A portion of the survey measured the amount of time faculty spent working with undergraduate students during the 2008-2009 academic year. When asked how many hours faculty spent working with undergraduate students (either as a Principal Investigator on their own project or as an advisor on a student-generated project) forty-two respondents provided a response (46.2%). Of *those* respondents, over half (52.4%) spent *more than 20 hours* working with undergraduate students. The rest of the distribution is as follows:

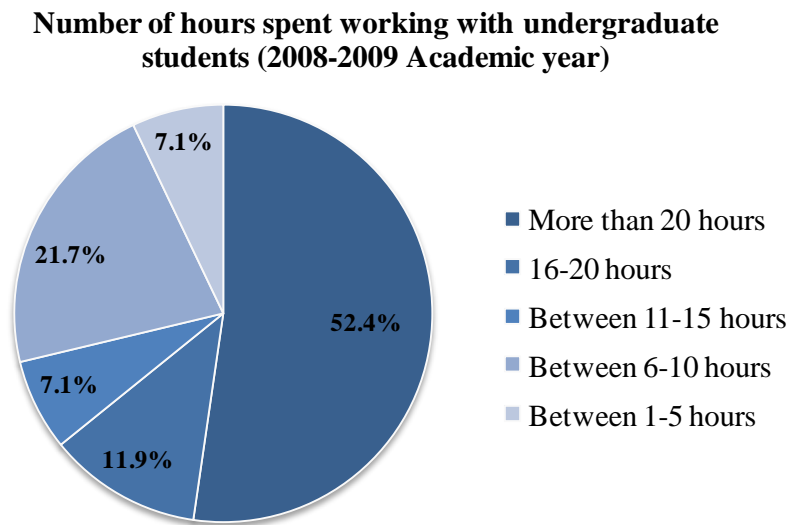


Figure 3: Number of hours faculty spent working with undergraduate students during the 2008-09 Academic year

Respondents were also asked to specify whether the time they spent working with undergraduates this year increased, decreased, or had no change. Again, over half of the faculty who responded (52.4%) indicated they *increased* their work with undergraduate students over the past year. The rest of the distribution is as follows:

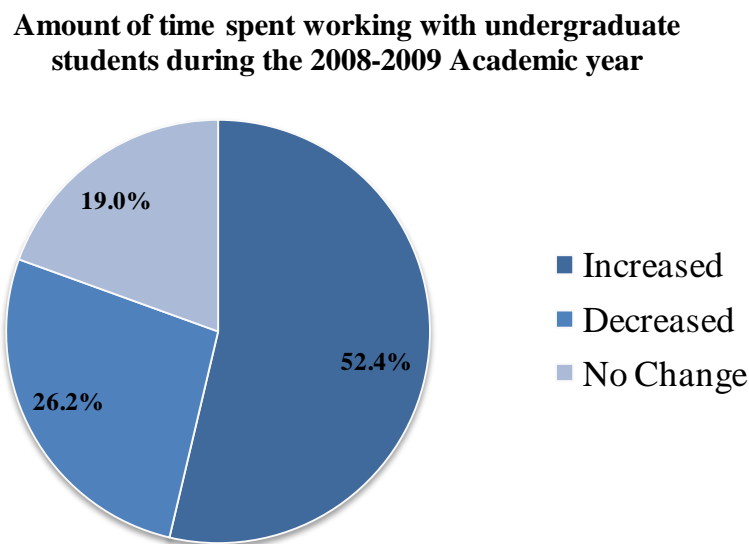


Figure 4: Change in the number of hours faculty spent working with undergraduate students during the 2008-09 Academic year

Faculty Assessment of Undergraduate Student Assistants:

Another section of the survey allowed faculty to provide assessments of their student assistant(s). Positive responses – “Strongly Agree” and “Agree” were combined in this analysis as were negative responses of “Strongly Disagree and Disagree.” According to the data collected, faculty generally agreed that undergraduate research helped in creating student interest, provided their students with opportunities to develop critical thinking skills, and allowed them gain enough knowledge to engage in their *own* research. To a lesser extent however, faculty indicated that their students have a clear understanding of research methods and practices. To some degree, this supports a previous idea that “...students may have the drive, motivation, and – indeed – the time to conduct research without necessarily having the requisite skills and experiences.” (Louis, 2008):

	Strongly Agree/Agree	Neutral	Strongly Disagree/Disagree
My student(s) is/are generally interested in the research they conduct.	88.4%	7.0%	2.3%
My student(s) have/has learned critical thinking skills through the research.	88.4%	9.3%	0.0%
My student(s) have/has a clear understanding of research methods and practices.	62.8%	25.6%	9.3%
My student(s) have/has gained enough knowledge from my project to design, conduct, present, and publish their own research.	81.4%	27.9%	11.6%

Figure 5: Faculty assessment of specific students

General Faculty Feedback Regarding Undergraduate Research:

In this section of the survey, faculty were allowed to provide general assessments on how working with undergraduate students impacted their work, their interest in future work with undergraduate students, and as well as their overall impressions of support services in place for undergraduate students. Again, positive responses – “Strongly Agree” and “Agree” were combined as were negative responses of “Strongly Disagree and Disagree.” The data in this area strongly suggest that faculty/student interactions through undergraduate research not only add value to the faculty’s research and teaching, but they also pave the way for additional work in the future. Not as widely agreed upon however, is the satisfaction level of support services offered for undergraduate research:

	Strongly Agree/Agree	Neutral	Strongly Disagree/Disagree
Working with students has added value to my research.	83.7%	9.3%	4.7%
Working with students has added value to my teaching/teaching techniques.	76.7%	14.0%	7.0%
I will engage in collaborative projects with undergraduate students in the future.	83.7%	4.7%	0.0%
The support services (funding, resources, equipment) for students are adequate.	25.6%	46.5%	25.6%

Figure 6: General faculty feedback

Faculty Who Did NOT Sponsor *Any* Undergraduate Research

Of the faculty surveyed, 48 (52.7%) indicated they did not sponsor *any* undergraduate research during the 2008-2009 academic year. Consistent with a previous study (Dotterer, 2002), most UM-Flint faculty who were not active in undergraduate research were met with the challenge of finding the time. Meeting the demands of the classroom along with numerous *additional* obstacles associated with their appointments made it difficult for some faculty to support undergraduate research. Other reasons for a lack of faculty involvement in undergraduate research included a limitation or lack of resources to support undergraduate research and the notion that some faculty projects required more training and experience than what was acquired at the undergraduate level. The frequency of responses is as follows:

	Frequency of Responses
Limited or no time to sponsor a project for students	14
Limited or no resources available to support undergraduate students	10
Project/area of research is not appropriate for undergraduate students.	9
Students have had limited or no research training.	8
More interested in working with graduate students or other faculty	7
Students have not been as committed as I need/expect them to be.	4
Students have had limited or no experience and/or skills.	3

Figure 7: Reasons faculty did NOT sponsor any undergraduate research projects last year

Additional Comments

The final question in this section was in an open-ended structure, allowing for the respondent to offer any additional comments about general research opportunities for undergraduates or about UROP specifically. Without actually listing each comment and suggestion left by faculty respondents, here are the highlights of the responses provided:

- Preparatory training is necessary for undergraduate students working on research projects; students are sometimes unprepared or unskilled
- Additional funding for students and materials/equipment is supported.
- Research opportunities outside of the sciences should be supported more.
- UROP provides an idea on what faculty can expect when they serve as sponsors for students.
- An undergraduate research course should be offered
- Working with undergraduate students impacts faculty teaching skills
- Role of research should be emphasized more for students.

A full listing of the comments and suggestions provided is available upon request.

Faculty Sponsorship in UROP

Of the faculty who participated in the study, only twenty-three (25.3%) sponsored⁷ a UROP project since the program launched in Winter, 2005. It should be noted that the community of UROP faculty sponsors was not wholly represented in this study, considering that a total of *thirty-two unique* faculty have sponsored UROP projects since the program's inception (Louis, 2008).

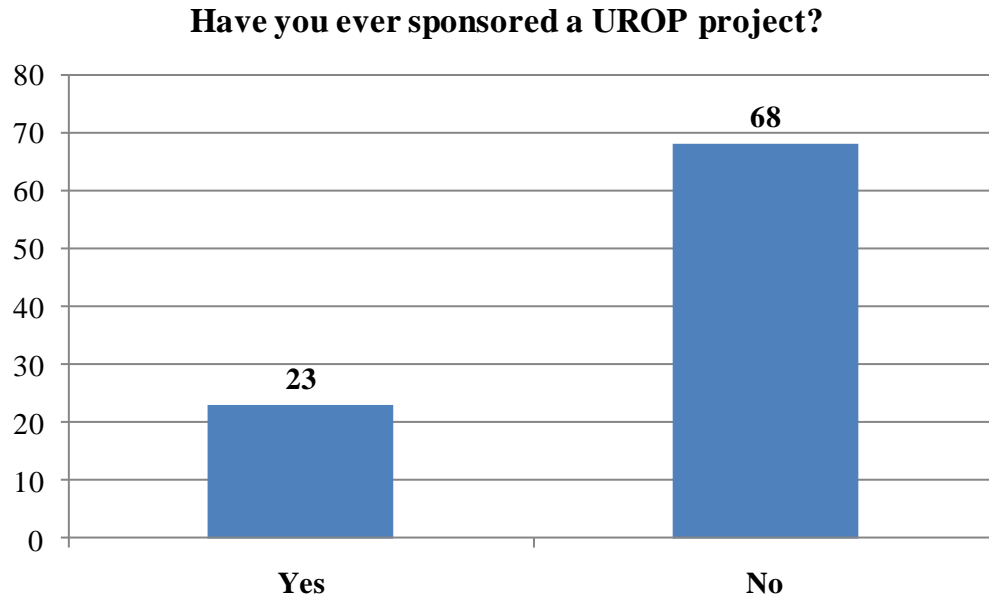


Figure 8: Faculty sponsorship in UROP

Despite the fact that only a quarter of *all* faculty interviewed actually participated in UROP, over half of the faculty who participated in *any* undergraduate research were *also* UROP sponsors (53.4%)⁸. This is significant because it recognizes UROP as a legitimate vehicle for supporting faculty/student research collaborations, even when the number of actual participants is low in relationship to the entire number of faculty at the University.

Also important to note is the observation that the majority of respondents were *not* associated with UROP. This will be discussed later in the report.

⁷ In this study, faculty “sponsorship” was defined as any “...experiences include serving as a principal investigator on a project with student assistants and/or advising undergraduate students on their own research projects.”

⁸ Forty-three respondents indicated they were involved with undergraduate research. Of those, 23 were involved in UROP.

Faculty who have sponsored a UROP project were prompted to answer a series of questions specifically addressing their experience with the program. When asked to provide their general impressions of UROP (where multiple responses were possible), the following were provided (in rank order):

Impressions of UROP	Frequency of Responses
Opportunity for experienced students to improve/increase their skills	20
Contribution to my research	18
Opportunity for inexperienced students to participate in research	17
Employment opportunity for students	13
Other impressions	1

Figure 9: Impressions of UROP

Based on the data collected in this particular question, it was very encouraging to see that many faculty perceive UROP as an opportunity for student experience and project contribution, as opposed to merely an employment opportunity.

Data collected in this study also suggest that participation in UROP has contributed to additional research and creative activities which extend beyond the normal boundaries of the program. Of the faculty who have participated in UROP,

- Eleven (47.8%) had students who presented at the Meeting of Minds Undergraduate Research Conference⁹
- Ten (43.5%) were able to present their findings at a professional conference
- Five (21.7%) had students who presented at the Michigan Undergraduate Research Forum¹⁰.
- Four (17.4%) have published results from their work

The next series of questions were extracted directly from an instrument used for UROP evaluation at the end of each academic year. Questions pertaining to marketing for UROP, program guidelines, and compensation were included in this section of the survey. In general, respondents agreed that UROP marketing/advertisement was satisfactory, application guidelines were well communicated, and program guidelines and policies were reasonable. A greater

⁹ Meeting of Minds is an undergraduate research conference jointly sponsored by the University of Michigan campuses in Flint and Dearborn, and Oakland University. <http://www.umflint.edu/research/MOM>.

¹⁰ The Michigan Undergraduate Research Forum is an undergraduate research conference involving students from the three University of Michigan campuses, Michigan State University and Wayne State University. These students present their research at the Michigan State Capitol Building. <http://www.umflint.edu/research/MURF>

distribution of responses was generated however, when the question of sufficient funding was raised. The following table summarizes the responses provided in this section:

Impressions of UROP	Strongly Agree/Agree	Neutral	Strongly Disagree/Disagree
Marketing and advertisement for UROP are satisfactory.	65.2%	26.1%	8.7%
Application guidelines are well-communicated.	82.6%	13%	4.3%
Funding for UROP ¹¹ was sufficient.	30.4%	21.7%	47.8%
UROP guidelines/policies are reasonable.	82.6%	8.7%	8.6%

Figure 10: Impressions of UROP from faculty participants

Faculty Assessment of Compensation Methods

As identified in another study, the ability for students to earn compensation often motivates their decision to participate in research (Louis, 2008). That in mind, faculty were provided with a list of various methods to compensate student researchers, all of which are currently available through UROP. When asked which method was *most preferred* by faculty for their student researchers, they overwhelmingly selected “Wages” (74.7%). The rest of the distribution is as follows:

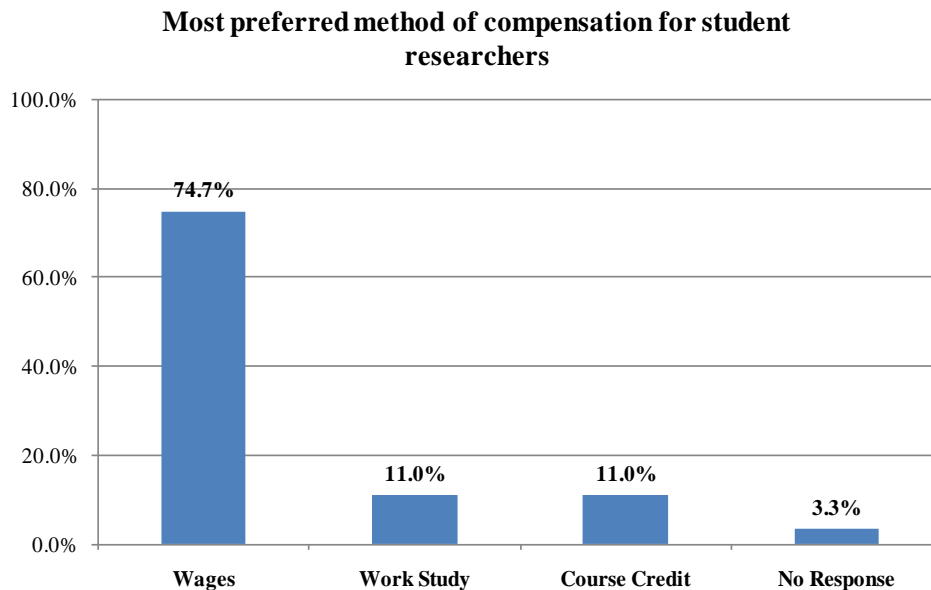


Figure 11: Type of compensation most preferred for student researchers

¹¹ Through UROP, students are awarded \$500 during fall and winter semesters, \$250 during spring and summer semesters. Faculty were asked to determine if this level of funding per student was sufficient.

The previous question specifically measured which compensations were most preferred. But in the interest of identifying what “other” type of compensations the faculty supported, an additional question “What other compensation methods would you recommend?” was included in the survey. When asked this question, the following open-ended responses were recorded, with the frequency of responses in parentheses:

- Increased wages (9)
- Competitive driven awards (2)
- Course credit (5)
- Letters of reference (1)
- Training course (3)
- Tuition support (3)
- Wages (8)
- Work study (3)

Research Opportunities Course

At the time the survey was being conducted, a proposal was submitted to create a campus wide credit-earning “Research Opportunities” or “Research Assistantship” course designed specifically for undergraduate research, similar to courses available at many other institutions (The nationally recognized UROP at the University of Michigan-Ann Arbor, for instance, has several courses designed for its program participants¹²). A question was included in the survey to measure the likeliness of UM-Flint faculty offering this as a compensation method if it became available. 28.6% of all respondents indicated they were “Very Likely” to offer such a course. Additionally, 30.8% indicated they would be “Likely” to offer such a course. The rest of the distribution is as follows:

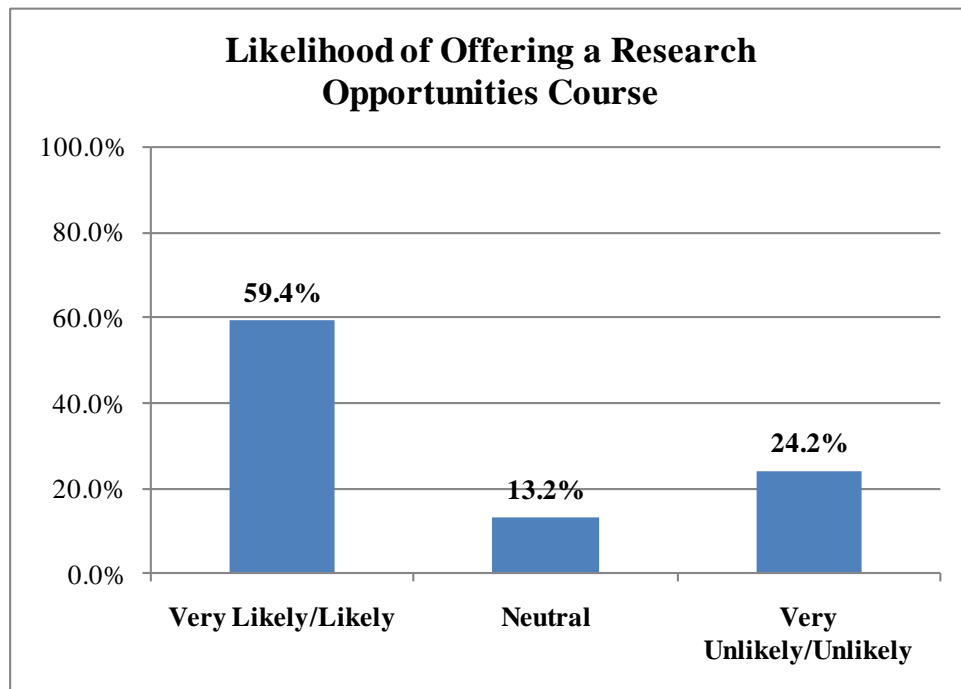


Figure 12: Likelihood of Offering a Research Opportunities Course

¹² UROP students at the University of Michigan-Ann Arbor can register for credit through the College of Literature, Science, and the Arts (UC 280), the School of Engineering (ENGR 280), the Department of Atmospheric, Oceanic and Space Sciences (AOSS 280), or through the Department of Movement Sciences (MOVESCI 280). <http://www.lsa.umich.edu/urop>

Faculty Who Did NOT Sponsor a UROP Project

Equally as important as collecting assessments from faculty who participated in UROP, understanding why faculty *have not* participated in UROP is critical. While UROP has seen consistent growth in the number of faculty who participate, there are still many others who can contribute to the program. Of the 91 faculty who participated in the survey, sixty-three (69.2%) have never sponsored a UROP project. The following table summarizes the reasons (multiple responses were possible) faculty indicated for not participating in UROP (in rank order):

Reasons why faculty have NOT participated in UROP	Frequency of Responses
Not currently working on any projects requiring undergraduate students	29
Not aware of UROP	25
Lack of time	15
Other reasons	13
Insufficient resources available for supporting student assistants on a project	6
Not interested in UROP	1

Figure 13: Reasons why faculty have NOT participated in UROP

“Other reasons” why faculty have not participated in UROP include:

- Limited faculty appointment (5)
- New faculty (4)
- Unaware of how to get involved (1)
- Does not need additional students (1)
- Not able to find effective students (1)
- Wanted to find specific students in their academic department (1)

Particularly as it relates to raising awareness of UROP, these data provide clear evidence that additional work is needed to increase faculty involvement in UROP. Fliers, brochures, and other literature may be helpful in increasing knowledge of the program. Additionally, visits to classrooms, meetings with departmental heads/program directors, and additional informational sessions (brownbag discussions, for instance) should also be considered.

Conclusion

Though the rate of response was much lower than desired, the survey results were very satisfactory. It was particularly satisfying to see the positive feedback provided for the Undergraduate Research Opportunity Program. While the program's success is mostly measured by the quantity of faculty research projects supported and the number of undergraduate students who participate, receiving comments about the *quality* of the program was just as fulfilling. Critical responses and suggestions for improvement also provided valuable information.

It was also rewarding to see the number of faculty who actively support undergraduate research. Many departments have either completely integrated or are gradually integrating research into various program curricula, particularly evidenced by the comprehensive listing of research-related courses available for students. Further, individual faculty continue to offer support for students; whether they are hiring assistants on their projects or offering mentorship as students engage in their own projects.

At no surprise, faculty also stressed the importance of offering viable compensation options for students involved in research. Often student involvement goes above and beyond their academic requirements. So it is expected that as students balance coursework, jobs, and other commitments with their research assistantship, their efforts will be met with some form of compensation. Some dissatisfaction exists with the current level of compensation offered, most notably with the amount of funding available. Recommendations on increased funding and to offer specific research assistantship courses were frequently provided throughout the study.

Similarly, some faculty have expressed dissatisfaction and/or concern with the lack of skills some students may possess prior to starting a project. Incentives may be helpful in encouraging students to commit the time and effort necessary to increase the skills they bring to a project. In that same vein, training resources and summer programs could be useful in stimulating student interest in research and improving their skills.

Based on the data collected, it is reasonable to conclude that faculty recognize the value that comes with student involvement in research. Namely, students who participate in research receive benefits directly related to the project (specific skills they develop, the knowledge they acquire, the presentations they organize, and the publications they produce). And while not directly reported, participation in research can also inject students with confidence, communication skills, time management abilities, and other important attributes. For these reasons – and to maintain the University's overall commitment to excellence – the Office of Research and the entire University of Michigan-Flint community must continue to promote a culture of research for our students.

Limitations of the Study

Perhaps one of the most notable limitations of this study was not identifying responses by academic unit or by school. For a more thorough analysis and a greater ability to compare and contrast activity across campus, any future studies will include both. Another limitation of the study was in not drawing distinctions between the academic ranks of the faculty surveyed. This would have been helpful in determining the level of undergraduate research sponsorship conducted as faculty move higher up the academic ladder. Also limiting the study was not

including a question to determine the best options for recruiting faculty and encouraging participation. Email is generally used to contact faculty, but if additional methods are as effective, they can be uncovered in future studies. Finally, the study did not provide a thorough definition of “research.” At least one respondent indicated confusion in differentiating research performed in a class setting and research done as an independent activity. Though the term “research” was meant to include *any* kind of work performed (faculty-generated research, student-generated research, or classroom assigned research), it was not clearly noted anywhere in the survey. Future studies may refer to the definition provided by Shokair as “...any inquiry, study or investigation undertaken by an undergraduate student (or group of students) under the supervision or mentorship of a faculty member that results in an intellectual or creative contribution to an area of study and is shared with others.” (Shokair, 2002.)

Acknowledgments

The author wishes to express thanks to many people who made this study possible. The community of faculty at the University of Michigan-Flint are to be commended not only for their participation in the study, but also for their role in tirelessly supporting undergraduate research. Special thanks are also in order for the faculty who have supported our Undergraduate Research Opportunity Program over the years. The growth of the program is a direct reflection of their dedication and support. Undergraduate students at UM-Flint – participants in UROP or otherwise – should also be recognized for keeping the culture of student research alive at UM-Flint. The Director of Research, Dr. John Callawaert is to be commended for his assistance in creating the survey instrumentation, reviewing the content in this report, and for his overall support and encouragement. Additional thanks are in order for Joe Kazemi, from the University of Michigan’s Center for Statistical Consultation and Research for his aid in analyzing the data. Finally, the author wishes to thank Deborah White, Director of the Office of Extended Learning, for her assistance in administering the survey.

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