

Luoma Leadership Academy

Action Learning Project Three

Imbedding Student Research in the Undergraduate Experience

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Imbedding Student Research in the Undergraduate Experience

Executive Summary

Problem: “Research experiences are becoming an integral part of the undergraduate experience. While all students will benefit from such opportunities, this is especially true of those students planning to transfer to four-year programs or who have graduate school as a goal. Identifying resources to support undergraduate research is a challenge in MnSCU, especially in two-year schools” (2011-12 Action Learning Projects, 2011, p. 4).

Team Charge:

The charge of learning project Team 3 was to “Conduct a literature review of education principles for providing undergraduate research and of ways to structure undergraduate research programs. Investigate best practices both within and outside of MnSCU for providing research experiences for undergraduates in the upper division and undergraduates in the lower division. Identify sources for both funding and personnel resources to support such research. Look at ways that such research can be showcased and recognized in MnSCU” (2011-12 Action Learning Projects, 2011, p. 4).

Executive Sponsor:

Dr. Joan Kuzma Costello, Provost, Inver Hills Community College

Team Advisor:

Kelly Branam, Associate Professor, Anthropology, St. Cloud State University
Susan Krook, Anthropology, Normandale Community College

Introduction:

Undergraduate research has been demonstrated to benefit both students and faculty. The team members were all well aware of how students become more engaged in their learning as they develop the skills to participate in the processes and procedures of their disciplinary areas in a relevant manner, and faculty are able to further their professional development and, along with their students, contribute to their fields of study.

Early work of the team focused on gaining perspective and understanding on the broad topic of undergraduate research within MnSCU. As a system, MnSCU is diverse, providing educational opportunities at two and four year institutions, in both liberal arts and technical education. With the diverse options for undergraduate research within MnSCU, determining a focus for the team charge presented the first challenge. In addition, although each of the team members was aware of undergraduate research initiatives at their own institutions, in order for us to address the project charge, team discussion and reflection lead to us develop additional questions we thought were relevant and at the same time, would help us understand how broadly across MnSCU such initiatives were occurring: how often was research being conducted; what disciplines/programs were involved; which institutions were involved, what was the level of interest or desire of institutions to engage in research; how was student conducted research communicated or presented; what was the institutional infrastructure supporting research; and what institutional support for faculty development and involvement was available.

Approach:

Our initial work centered on developing a definition of undergraduate research and obtaining background information on research initiatives occurring within MnSCU. We felt that creating this definition helped us feel confident we would capture MnSCU as a broad entity offering a wide variety of programs and courses of study, and provide a harmonious perspective of research for the diverse programs and courses of study across the system. In addition, we also felt it would helpful for us when thinking about our questions and learning related to the charge of this project.

One of the early discussions of the group also focused on the question of literature related to best practices in undergraduate research. The group agreed that there are excellent resources available through national organizations such as the Council on Undergraduate Research (CUR) and the Association of American Colleges and Universities (AAC&U). In addition, many disciplinary societies also have resources related to undergraduate research in their fields. The team decided to provide a list of resources at the end of this document that they felt would be most beneficial to faculty and administration looking to initiate or strengthen their undergraduate research efforts.

One of our team members participated in a CUR workshop during the project timeframe and is involved in another CUR initiative. The workshop focused on undergraduate research at 2-year institutions and a report about both the workshop and the initiative follow in our findings.

Finally, in order to best understand the scope of existing undergraduate research activities at MnSCU institutions and help us address the questions we established, we developed a short survey that was delivered to deans at all MnSCU institutions using the MnSCU deans listserv. The directions for the survey asked that deans either answer the questions themselves and/or forward the survey on to other individuals in their institution who would be better suited to answering the questions.

The following questions were asked:

Item 1: Please identify your college or university.

Item 2: What is your position with the college or university?

Item 3: Do undergraduates on your campus have the option of engaging in supervised research?

If Yes to Item 3...

Item 4: Is undergraduate research on your campus primarily limited to the STEM disciplines?

Item 5: Can undergraduates on your campus become involved with research in the arts and/or humanities?

Item 6: Can undergraduates on your campus become involved in research in the trades and/or professions?

Item 7: What is done on your campus to integrate undergraduate research into the curriculum?

Item 8: What are the perceived resources, which support undergraduate research on your campus?

If No to Item 3...

Item 9: Is there interest on your campus to initiate programs of undergraduate research?

If Yes to Item 9...

Item 10: Is the interest primarily limited to the STEM disciplines?

Item 11: Does the interest include arts and/or humanities disciplines?

Item 12: Does the interest include the trades and/or professions?

Item 13: What are the perceived obstacles to starting undergraduate research on your campus?

Item 14: Would there be an interest on your campus to engage in state university-community college collaborations to support undergraduate research?

Outcomes and Key Findings:

As part of our reflective inquiry process, the team developed the following definition of undergraduate research:

A culture of inquiry on campus that begins with the knowledge and passion of the faculty and their desire to incorporate the best practices of research or inquiry within the fine arts, humanities, social sciences, natural sciences, and in the applied programs. It is modeled from the first day of class and is predicated upon engaging students to more deeply comprehend the principles of study and the applications of practice in their respective areas of learning. Faculty guide students, often as a collaborative venture, to investigate relevant problems, test those problems with the methods representative of their area of learning, and share their findings with an appropriate audience.

The definition underwent a variety of iterations as we learned more about undergraduate research as we learned more about these efforts across the various MnSCU institutions. It is our hope that this definition provides a broad context to help define the various forms of research and inquiry-driven learning that students within our system are exposed to.

MnSCU Participation in CUR-related Activities

A. CUR Workshop - Brooklyn Park - October 2011

The Council on Undergraduate Research (CUR) obtained a National Science Foundation (NSF) grant in 2006 to evaluate the status of undergraduate research efforts at two-year institutions in the United States. The first step involved five regional listening sessions in 2006-2007 (although none in Minnesota), which led to a series of training workshops (for faculty and administrators) in 2010-2011. One of these workshops was hosted by North Hennepin Community College in Brooklyn Park in October 2011. Eight MnSCU institutions participated in this two-day event, which featured presentations from experienced faculty who have incorporated research programs into their curriculum. The major themes of the presentations revolved around the definition of "research" (including the differences in expectations between two- and four-year institutions), models of implementation, faculty development, and institutional support.

B. CCURI Initiative - Minneapolis - May 2012

One of the ancillary activities arising out of the CUR initiative (mentioned above) was a series of NSF grants written by Biology faculty at Finger Lakes Community College in New York State. After successfully establishing a research program for students at that institution, the faculty involved decided to pursue greater NSF support for a national network of community colleges to implement similar programs. Support was granted for a \$3.3 million project over the next three years, in which FLCC faculty and staff will assist 26 other "partner" institutions in designing and funding curricular-based research projects. Anoka-Ramsey CC and North Hennepin CC are both partners in this project. Four other institutions, including Minnesota State CTC, are designated as "regional collaborators", with access to training, communications and contacts within the partner network, but without direct financial support. The initial training sessions were held at four sites in Spring 2012, including Minneapolis in May. Those three MnSCU institutions all participated in the CCURI training session at that time. Marilyn Hart,

UGR Coordinator at Minnesota State University-Mankato, also attended that session.

Key Findings from the Survey

1. There were a total of 55 individual responses to the survey. Although not everyone responded to every question, the representation across MnSCU was excellent. Responses came from all 7 universities and all 30 of the community colleges. This suggests that our findings have real generalization/transferability within the system.
2. A majority of the campuses responded that they already offer opportunities for undergraduate students to engage in supervised research. More than half of the responses suggested such opportunities are limited to the STEM disciplines. It nonetheless appears that opportunities for undergraduate research in the arts and humanities is quite common, and is fairly common among the trades and professions.
3. Analysis of the responses regarding what is already being done to integrate undergraduate research into the curriculum suggests 8 themes. In no particular order: First, it appears there are attempts at a number of institutions to integrate research into coursework, sometimes with the goal of producing public scholarship. Second, there seems to be a trend that some faculty do this "on their own time", which we think can be interpreted to mean that the research aspect of the course is not required per course objectives. Third, some faculty apparently are using their research to enrich the courses they teach. Fourth, there is the ostensible popularity of forming committees to explore the possibility of undergraduate research. Fifth, there also appear to be a number of undergraduate research conferences/fairs; this is something that might be more manifest at the universities. Sixth, capstone projects that require research appear to be required across the disciplines. Again, this might be limited primarily to the universities. Seventh, there are ostensible efforts to offer faculty with professional development opportunities to consider incorporating undergraduate research into their courses. Eighth, there appears to be some collaboration going on with other institutions, ones not necessarily in MnSCU.
4. Data further indicate that respondents to the survey perceived three primary foci of support toward the creation of opportunities for undergraduate research. In order, these are the most notable: (a) faculty interest, (b) faculty knowledge base, and (c) administrative support. Conversely, respondents indicated their perceptions of obstacles to such efforts. In order, these are the most notable: (a) finances, (b) faculty knowledge base, and (c) facilities.
5. This group of results is rather interesting, and may be indicative of the current state of affairs within MnSCU. The fact that faculty knowledge base was perceived so orthogonally suggests possible evidence of the fundamentally different cultures around research that exist at the universities versus community colleges.
6. Finally, there was unanimous interest among respondents in university-community college collaborations to foster opportunities for undergraduate research. However, only 8 respondents addressed this item. It is difficult to avoid the impression that the interest in such endeavors is simply quite low among most institutions. Perhaps the reality is that the institutions within MnSCU tend to be insular.

Recommendations:

1. There is major interest within the universities and community colleges of MnSCU to create and maintain opportunities for undergraduate research across the disciplines, most especially within the STEM disciplines.
2. The greatest boon to creating opportunities for undergraduate research across the disciplines appears to reside among the faculty. Thus, they should be the primary drivers of such initiatives.
3. At the same time, there is ostensible concern regarding faculty preparedness at some institutions to take on the mantle of opportunities for undergraduate research across the disciplines. It is recommended that administrators can do their part to support the relevant professional development and encouragement of the faculty.
4. Finances and facilities are commonly perceived to be obstacles to creating opportunities for undergraduate research across the disciplines. It is notable that the majority of respondents to the survey were administrators, yet still these were prevalent themes. It is recommended that faculty and administrators collaborate on these matters to best determine how to utilize the limited resources on campuses to promote opportunities for undergraduate research.
5. There does not appear to be significant interest within MnSCU institutions for university-community college collaborations to promote opportunities for undergraduate research across the disciplines. Perhaps the efforts and funds of the Office of the Chancellor could be better utilized to work with each campus individually while publicizing each campuses' success as models of best practice.
6. The team had multiple conversations with Dr. Marilyn Hart, Director of the Undergraduate Research Center at Minnesota State University Mankato. Dr. Hart is interested in organizing a group of faculty and administrators from across the system to work on collaborations. Our team strongly endorses this idea and feels that it may be one way to not only develop more collaborations within the MnSCU system, but that the group could also help increase awareness of existing undergraduate activities within the system, provide the a resource of best practices, and perhaps be a vehicle for finding ways to help faculty and administrators overcome obstacles.

Resources and References

Council on Undergraduate Research www.cur.org

Selected CUR Publications on Best Practices:

Characteristics of Excellence in Undergraduate Research (COEUR)
(full text online)

http://www.cur.org/publications/publication_listings/COEUR/

Developing and Sustaining a Research-Supportive Curriculum: A Compendium
of Successful Practices (available for order online)

Creative Inquiry in the Arts and Humanities: Models of Undergraduate Research
(available for order online)

CUR also have a variety of conferences, a quarterly publication, affinity groups and additional resources on their website, which has been newly redone.

Community College Undergraduate Research Initiative www.ccuri.org

Association of American Colleges and Universities www.aacu.org

Selected AACU Publications on Best Practices

Project Kaleidoscope: Advancing What works in STEM Education
<http://www.aacu.org/pkal/publications/index.cfm>

High Impact Education Practices: What They Are, Who Has Access to Them, and
Why They Matter. 2008. George Kuh
http://www.neasc.org/downloads/aacu_high_impact_2008_final.pdf