Michigan Technological University

Shared Research Equipment and Core Facilities Working Group

Final Report

April 17, 2013
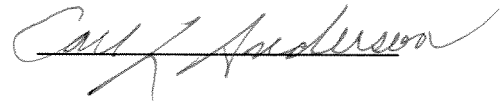
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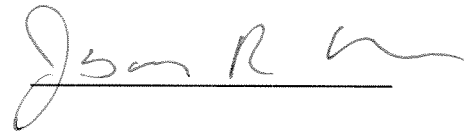
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Shared Research Equipment and Core Facilities Working Group

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At the request of the Dean's Council, the Provost and the Vice President for Research convened this Working Group to examine issues related to the management and sustainability of shared research equipment and core facilities. This is recognized by the Dean's Council as an important effort in the continuing maturation of Michigan Tech as a research institution.

Charge

Research equipment is increasingly costly, and in many cases requires dedicated technical staff to maintain. It is increasingly difficult for single investigators or even departments to generate sufficient sample numbers to achieve economies of scale sufficient to sustainably support such expensive research equipment. Many universities are increasingly sharing equipment among different laboratories and developing core facilities supporting particular areas of research. There are some examples of such facilities at Michigan Tech today, such as the Applied Chemical and Morphological Analysis Laboratory [ACMAL] and the Animal Care Facility [ACF].

The Provost and the Vice President for Research established this Working Group to:

1. Review existing examples of shared equipment and core facilities at Michigan Tech to understand the range of ways these activities are managed today and to understand 'best practices' within our institutional culture.

2. Review examples of shared equipment and core facilities at other research universities to understand management of these facilities in different institutional cultures and to understand 'best practices' that could be adapted to Michigan Tech.

3. Recommend principles for the use and maintenance of shared equipment and core facilities, including staffing and financial sustainability, that can be implemented across all examples of these at Michigan Tech, realizing that the details may differ in different situations.

4. Any further recommendations on any subject related to shared research equipment and core facilities that the Working Group identifies during its deliberations.

For maximum effectiveness, a report should be delivered to the Provost and the Vice President for Research no later than April 1, 2013.

Principles

The University Space Committee established the University Space and Equipment Management Guidelines[1] in 2012. This Working Group endorses the principles identified in that document, particularly:

Principle 1: *"To avoid duplication of space, equipment, and staff services, and to avoid unnecessary costs, as much space and equipment as possible should be shared by departments."*

This Working Group notes that other principles identified by the Space Committee apply to equipment as well as to space:

Principle 2: Although equipment is assigned to departments and specific users, all equipment is University equipment, and administrators at all levels have the responsibility to insure that equipment is efficiently and effectively utilized. Faculties, departments, schools, and administrative units do not have exclusive or pre-emptive rights to the utilization of equipment.

Definitions

For purposes of this Working Group, the following definitions are used:

Shared Equipment or Facilities: Equipment or facilities that are utilized by more than one researcher within a department, or by individuals from more than one department, school, center, or institute.

Core Facility: Collection of equipment identified by the University as essential to high priority research activities, usually interdisciplinary activities, that span multiple departments, schools, centers, and institutes. These typically require dedicated skilled technical staff, and may be located in contiguous space or be spread among several different physical locations.

Existing Facilities

The Working Group toured a number of existing facilities and met with associated staff to discuss issues related to the sustainability and management of the shared equipment or core facility. Included in these tours were the: Applied Chemical and Morphological Analysis Laboratory (ACMAL), Animal Care Facility (ACF), Great Lakes Research Center

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[1] http://www.admin.mtu.edu/admin/Space/SpaceEquipmentManagementGuidelines.pdf

(GLRC), SFRES plant, soil, and water analytical laboratories, and the microfab/cleanroom.

Several common issues were identified during these visits and discussions:

Issue 1: There is no mechanism to insure replacement or enhancement of either shared equipment or core facilities.

Equipment is often acquired through pursuit of one-time funding or through grant mechanisms, such as the National Science Foundation Major Research Instrumentation (MRI) Grants. While we have had considerable success with these mechanisms, they are opportunistic and are often not backed by assessment of institutional priorities. With programs like the MRI grants, the Deans do evaluate competing proposals to set priorities for submission, but the opportunities arise from groups of individual faculty rather than an organized institutional prioritization process. The Dean's Council is addressing this prioritization issue at this time, and this Working Group supports Dean's Council's efforts to proactively identify teams of faculty to pursue major instrumentation funding based on institutional priorities.

Issue 2: Utilization of shared equipment and core facilities is often not sufficient to support the dedicated, highly skilled technical staff that is necessary to insure both the management and maintenance of the equipment and facility, but also to train associated students and others in the use of the equipment and facility.

Issue 3: The current practice of returning general fund support equal to half of the indirect costs recovered from use fees to the laboratory is not sufficient to address either of the two issues identified above.

Issue 4: The greater the number of individuals in a laboratory, the more difficult it is to maintain standards of laboratory safety and cleanliness, and the more difficult it is to insure that appropriate operating procedures are consistently applied.

Core Facilities at Other Universities

A number of universities have posted information on their core facilities at Science Exchange[2], and there are links to information on equipment available, costs, and contact information. Information on specific sites was obtained from several people, such as the Van Andel Research Institute[3] (M. Abbott) and the Shared Research Instrumentation

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[2] https://www.scienceexchange.com/
[3] http://www.vai.org/en/about-vai/news-and-events/~/media/VAI/About/PDFs/FactSheet_VAI.ashx

Facility at George Mason University[4] (M. Gretz). In addition, other facilities such as the Shared Access Facility at George Mason[5] were identified through web searches.

The Shared Research Instrumentation Facility at George Mason has a particularly well-defined description of laboratory policies that address issues related laboratory safety and cleanliness[6]. Other examples of such policies include:

- http://www.bio.purdue.edu/research/groups/tmcf/
- http://www.purdue.edu/discoverypark/nanotechnology/facilities/operations.php
- http://www.nuance.northwestern.edu/epic/Policy%20and%20Rate/index.html
- http://genomics.ucr.edu/facility/regulations.html
- http://www.uri.edu/inbre/corelab/index.shtml
- http://sysbio.harvard.edu/csb/resources/policies/policies.html
- http://pediatrics.duke.edu/research/core-facility
- http://ecocore.nrel.colostate.edu
- http://anlab.ucdavis.edu

Discussion and Recommendations

The following discussion areas and recommendations were identified by the Working Group as areas to be addressed across all shared equipment and, especially, core facilities. It is recognized that the details may vary due to different circumstances, and the recommendations are not necessarily in priority order. Most of these can be implemented with little or no direct costs.

Access. Equipment and laboratory resources utilized by multiple users needs to have well-developed and consistently applied policies regarding access and utilization that are well understood by all users. Issues such as who pays for consumable supplies, technician time, maintenance, and who is responsible for costs incurred due to mis-use all need to be clearly defined and understood by all. A written copy of these policies should be accessible to all users and other interested parties.

Recommendation 1: The Working Group recommends that core facilities develop policy documents similar to those cited in this report; these obviously have to be tailored to the specific situations and will differ among analytical facilities and other types of shared equipment.

The existence and availability of shared equipment and core facilities needs to be known by both internal and external potential users. The Techfinder site[7] is a source of such

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[4] http://www.gmu.edu/depts/SRIF/
[5] http://ece.gmu.edu/~qli/SAF.htm
[6] http://www.gmu.edu/depts/SRIF/about_policy.html
[7] http://techfinder.mtu.edu/

information, and includes the ability to search for different types of equipment and for finding access information, who to contact, etc. The Working Group believes that shared equipment and core facilities should be listed on that site, and possibly other places, including department or school web pages as appropriate.

Recommendation 2: The Working Group recommends that the Provost periodically remind academic units, and the Vice President for Research periodically remind Centers and Institutes, to post information on their shared equipment on Techfinder and their unit web pages in order to facilitate access by both internal and external audiences.

Acquisition. As noted previously, the University Space and Equipment Management Guidelines charge Deans and Chairs with insuring the efficient and effective use of all University resources they control. While it is justifiable in certain circumstances to acquire equipment that may have low utilization and require a subsidy, such as equipment that provides unique capabilities or combinations of capabilities when considered together with existing equipment, it is important to consider the level of use and financial resources required to maintain and operate equipment at the time the purchase is being considered. It is also important to remember that equipment is increasingly complex, and many instruments no longer even come with repair documentation. In these cases, maintenance costs must be planned for on an ongoing basis. As also noted previously, there is considerably more access today to core facilities at other universities, and in many cases it is simpler and less expensive to send samples out for analyses than it is to maintain and staff laboratories with low levels of use. Outsourcing also provides access to trained personnel and established quality assurance/quality control procedures that may be difficult to satisfy locally.

Recommendation 3: The Working Group recommends that the Provost work with the Deans to develop means of incorporating core facility considerations into equipment purchasing decisions, including those in faculty startup packages.

Simultaneously, it is important to consider institutional priorities and campus-level utilization in acquisition decisions. The Working Group strongly endorses the efforts of the Dean's Council to develop such a prioritization process. We recognize that this may require some cultural shifts that, in some circumstances, may put collective needs ahead of individual researcher's desires. This would be true, for example, if the Deans were to change the way we approach funding programs like the National Science Foundation's Major Research Instrumentation program, and move toward proactive assembly of teams to target campus-level equipment needs rather than the current process of having proposal ideas emerge from individual faculty or small groups of faculty.

Recommendation 4: The Working Group endorses the efforts of the Dean's Council to develop a process of prioritization institutional needs and identifying teams to pursue

identified high priority grant opportunities. Individual faculty and staff or small teams of faculty and staff may still propose ideas through their Chairs, Deans, and Directors.

Financial Support. The major issues the Working Group heard from each facility focused around financial support, particularly with respect to eventual equipment replacement, support for professional staff, and maintenance contracts. At this time, Colleges, Schools, and Departments often provide some level of support for professional staff, but support for equipment maintenance and replacement seems too often be assembled in emergency situations, either when something is broken or otherwise unusable. A more sustainable method of developing this support in core facilities and for widely shared equipment is needed.

The exact method of obtaining this support is not clear at this time. The Working Group notes that in the current Facilities and Administrative Cost Rate Agreement[8], 3.10% of the 55% uncapped, on-campus rate is based on research equipment depreciation allowances. In FY13, this amounts to roughly $350,000 that the University is being reimbursed for research equipment depreciation, but which is not pooled for equipment purchase or replacement at this time. Re-directing 3% of IRAD funds, therefore, might be one method of building such a pool to support shared facilities and core equipment. The Working Group further notes that if this were to be combined with the current $150,000 used for the Research Excellence Fund – Infrastructure Enhancement program, it would result in about $500,000 per year for support of shared equipment and core facilities. We believe that the majority of this should go towards support of core facilities, but believe that it is important to include a component for shared equipment outside of core facilities. We also believe that such a pool, of whatever size is feasible, should be managed by the Vice President for Research, and note that regular communication with the Deans would be needed to insure support for appropriate costs. We further note that this kind of program would require some method for identifying or validating core facilities in order to qualify for access to the support pool.

Recommendation 5: The Working Group recommends that the Provost work with the Deans and the Vice president for Research to develop a pool of funds that could be used for sustainable support of shared equipment and core facilities. The Working Group acknowledges that reduction in IRAD and/or Research Excellence Fund – Infrastructure Enhancement funds may be necessary to accomplish this designated pool of support funds.

Recommendation 6: Following development of the funding mechanism, the Working Group recommends that the Vice President for Research develop standards for

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[8] http://www.mtu.edu/research/references/facts-figures/pdf/predetermined_f_and_a_rates_fy13_16.pdf

certification as a core facility and a process to identify core facilities that would qualify for access to these funds.

Safety and Cleanliness. The Working Group notes that the more people using a particular piece of equipment or facility, the more difficult it is to insure that high levels of safety and laboratory cleanliness are met. We note that the Office of Compliance, Integrity, and Safety has laboratory safety responsibilities, and recognize that they have prioritized laboratory biosafety as the current highest priority. We believe, though, that it should be possible to develop a regular program of safety inspection for all shared facilities that would result in a better and safer working environment for faculty, staff, and students.

Recommendation 7: The Working Group recommends that the Vice President for Research work with the Office of Compliance, Integrity, and Safety to develop a program for regular safety inspection for all core facilities.

Use Fees. In many of the discussions with core facility managers and users, there was a consistently expressed desire to keep use fees as low as possible. The Working Group recognizes that this is appropriate and admirable and acknowledges that higher use fees can lead to reductions in utilization, but also recognizes that setting use fees below allowable actual costs requires that some source of subsidy be identified if the equipment or facility use is to be sustainable. We note that use fees actually charged can be below those set through the use fee approval process [but the charged fees cannot exceed the approved fee]. If a use fee is set to recover allowable actual costs, a lower level can be set for internal versus external users, explicitly recognizing that an internal subsidy is required to sustain the facility or equipment. Projects run through a Center or Institute could be assessed lower fees, possibly reflecting an understanding with the Center or Institute to contribute to the costs of acquiring, maintaining, or operating the facility. The difference between the approved use fee and the amount actually charged might, in appropriate circumstances, meet requirements to qualify as a portion of required cost share on grants and contracts. We recognize that setting the use fee to reflect actual allowable costs may result in fee levels that are substantially greater than core facilities at other institutions may charge, but believe that setting the approved use fee equal to actual costs also makes the required subsidy explicitly clear to all. In our opinion, a best practice is to set the use fee to reflect all appropriate costs and then make a decision as to whether to reduce the fee for some or all users.

Recommendation 8: The Working Group believes that Use Fees should be calculated based on all allowable actual costs, but recognizes that, for a variety of reasons, managers of shared equipment or core facilities may choose to charge and advertise a lower amount to some or all users.

We also note that the current practice is to return 50% of the Facilities and Administrative costs collected from use fee expenditures to the laboratory responsible for the equipment associated with the use fees. The intent was to provide a source of funds for eventual equipment replacement, but in reality this results in small pools of funds in each laboratory that are not sufficient to support professional staff or to build reserves for future equipment replacement. Over the last 5 years, the total amount returned to laboratories across campus has ranged from roughly $50,000 to $85,000 per year. The laboratories receiving these funds rely on them for a variety of critical needs, but they are not generally sufficient to insure sustainability of shared equipment and core facilities.

Recommendation 9: The Working Group recommends that the Vice President for Research convene an appropriate group to review current practices of IRAD returns associated with use fee expenditures.

Summary of Recommendations

Recommendation 1: The Working Group recommends that core facilities develop policy documents similar to those cited in this report; these obviously have to be tailored to the specific situations and will differ among analytical facilities and other types of shared equipment.

Recommendation 2: The Working Group recommends that the Provost periodically remind academic units, and the Vice President for Research periodically remind Centers and Institutes, to post information on their shared equipment on Techfinder and their unit web pages in order to facilitate access by both internal and external audiences.

Recommendation 3: The Working Group recommends that the Provost work with the Deans to develop means of incorporating core facility considerations into equipment purchasing decisions, including those in faculty startup packages.

Recommendation 4: The Working Group endorses the efforts of the Dean's Council to develop a process of prioritization institutional needs and identifying teams to pursue identified high priority grant opportunities. . Individual faculty and staff or small teams of faculty and staff may still propose ideas through their Chairs, Deans, and Directors.

Recommendation 5: The Working Group recommends that the Provost work with the Deans and the Vice president for Research to develop a pool of funds that could be used for sustainable support of shared equipment and core facilities. The Working Group acknowledges that reduction in IRAD and/or Research Excellence Fund – Infrastructure Enhancement funds may be necessary to accomplish this designated pool of support funds.

Recommendation 6: Following development of the funding mechanism, the Working Group recommends that the Vice President for Research develop standards for certification as a core facility and a process to identify core facilities that would qualify for access to these funds.

Recommendation 7: The Working Group recommends that the Vice President for Research work with the Office of Compliance, Integrity, and Safety to develop a program for regular safety inspection for all core facilities.

Recommendation 8: The Working Group believes that Use Fees should be calculated based on all allowable actual costs, but recognizes that, for a variety of reasons, managers of shared equipment or core facilities may choose to charge and advertise a lower amount to some or all users.

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