Developing and Supporting Interdisciplinary Research Clusters at a Metropolitan Undergraduate Institution

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Presentation Outline

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- Genesis of Program
- Chronology
- Research Cluster Seed Fund Program
- Funded Research Clusters
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About the University of Southern Maine

- Located in the city of Portland.
- The greater Portland region is the economic and population center of Maine.
- One of seven institutions in the University of Maine System.
- The state’s only publically supported predominately undergraduate university.
- Serves a diverse student body of approximately 8,000 who are recruited from throughout New England.
- Many students are non-traditional in that they are first-generation college students, part-time, and often older than traditional undergraduate students.
- Since the late 1990’s, USM has been committed to strengthening both its educational mission and its targeted research portfolio.
- Currently transforming itself into a metropolitan university.
The complexity of current societal, global, and scientific problems often requires a wide range of disciplines collaborating across traditional boundaries to bring knowledge to bear on issues of intellectual, scientific, social, economic, environmental and cultural importance.

Federal agencies such as NIH, NSF and NSF/NEA recognize the importance of interdisciplinary research and are providing support.

Many universities have pushed to develop more interdisciplinary research projects, creating linkages between their interdisciplinary research projects and state, regional and local public and non-profit entities is of utmost importance.

Challenges include articulating the relationship between interdisciplinary research and hiring, promotion and tenure policies, and resource allocation.

Why not at the University of Southern Maine?
Chronology

- Fall 2012: Decision to sponsor a cluster competition.
- Our research yielded few examples of how institutions like USM are supporting interdisciplinary research clusters.
- Using examples from larger institutions, we developed our program.
- Round 1 was released in spring 2013; four awards in summer 2013
- Summer 2013
  - Hosted Janet Woolman, Director of the Louisiana Environmental Research Center (LERC), to share her experience with establishing LERC at a seminar for faculty.
  - Hosted Rich Dunfee to speak to Round 1 Cluster teams and USM Administrators. We gained his insight on how to provide a support system for clusters.
- With minor modifications, Round 2 was released in September 2013 and released in December 2013; one award in summer 2014.
Research Cluster Seed Fund Competition

**Purpose**
The purpose of the Fund is to seed support the development of faculty-led multi-disciplinary research clusters that bolster and expand scholarship and innovative high-impact research *across college lines* and to work more effectively with the private sector, other institutions and the community.

The outcomes of funded cluster proposals:
A. Coalesce the depth of USM faculty expertise to address industry and community needs;
B. Bring greater internal and external attention to USM faculty research and scholarship, deepening its cumulative impact; and
C. Help leverage external funding for sustained collaborative efforts.
Research Cluster Seed Fund Competition

Competitive Process

• Two rounds of internal requests for proposals
• $150,000 over two years.
• Faculty collaboration across two or more colleges
• Research projects must address the needs of one or more of the state’s target technology sectors, and have at least one industry partner and one community partner actively engaged in the development and sustainability of the cluster.
• Industry partners are private, for-profit companies, and community partners are other organizations that are not for-profit organizations.
• Cluster size not specified but suggested 3-7 individuals inclusive of industry and community partners as an initial starting point for cluster development.
• Development and growth of the cluster should not end when external funding proposals are submitted or funded.
• Competitive cluster proposals must include detailed strategies, developed jointly with industry and community partners, for growing and sustaining the cluster beyond the two years of funding, including pursuing external funding.
Research Cluster Seed Fund Competition

**Allowable Use of Funds**

- Nine-month faculty summer compensation.
- Undergraduate and graduate student stipends (with graduate tuition).
- Consultants, materials and supplies.
- Remodeling or alteration of facilities.
- Small equipment purchases directly related to project.
- Community workshops.
- In-state and out-of-state travel (no foreign travel) as long as travel to directly related to the proposal project.
- Course release (cost for a part-time faculty only).

Although curriculum development is not an eligible activity in this competition, in some cases, curriculum development may be a component of an application but it must be justified in the context of seeding the research cluster, meeting the needs of industry and the community partners, and it should not be a major cost.
Research Cluster Seed Fund Competition

*Letter of Intent*

- Required two months before the deadline for the full proposals.

- Helps manage the external review process.

- Required information included names and contact information for five individuals with expertise in the proposal’s subject matter.

- The potential reviewers must reside outside the state and must not have any conflicts of interest with the proposal, the PI and Co-Pis.

- Applicants were instructed not contact the potential reviewers and alert them of their interest to participate in the review.
Research Cluster Seed Fund Competition

Proposal Format and Content Requirements

• Font type, font size, margins, line space, and page limit per narrative section.
• Content requirements included
  o Cover Page
  o 250-word abstract
  o Proposal narrative (15 pages)
  o References
  o Budget and budget justification
  o Biosketches using NSF or NIH formats
  o Letters of commitment from all partners, department chairs and college deans.
• Required sections of the narrative included
  o Rationale and Significance
  o Rationale Behind Team Composition
  o Cluster Vision, Goals, and Measurable Objectives
  o Research Overview
  o Implementation Plan
  o Specific Plans for the Target Grant Application(s)
  o Management Plan
  o Evaluation Plan
Research Cluster Seed Fund Competition

**Review Process**
- Two stages
- **External Reviewers**
  - At least three per proposal
  - Strengths and weaknesses without scoring.
  - Recommend further consideration.
- **Internal Review Panel**
  - Selected by Provost and Associate Provost for Graduate Studies and Research
  - Faculty from several departments without conflicts of interest.
- **Evaluation Rubric for Internal Review**
  - Similar to approach used by the Department of Education
  - Maximum score of 125 points.
- **Applicants provided 15 minutes to present their proposal.**
- Rank order of the proposals to AVGR who did not participate in the reviews

**Evaluation Rubric**
- Quality of Response to Instructions (25 points)
- Quality of Rationale and Significance (15 points)
- Quality of Rationale Behind Team Composition (15 points)
- Quality of Cluster Vision, Goals, and Objectives (10 points)
- Quality of Research Overview (10 points)
- Quality of Implementation Plan (15 points)
- Quality of Specific Plans for the Target Grant Application(s) (10 points)
- Quality of Management Plan (10 points)
- Quality of Evaluation Plan (10 points)
- Quality of Budget and Budget Justification (10 points)
Research Cluster Seed Fund Competition

Award Conditions
• Progress and final reports
• At least one submitted proposal to an external sponsor before the end of the project period with a total value exceeding twice the value of the cluster grant amount
• An annual presentation to the university community
• Published or otherwise publicly available work in some form
• Participation of the PI and co-PIs in a grant-writing workshops
• 20 percent of the grant amount withheld to ensure compliance with the award conditions
• Overspending of authorized grant amount would default to departmental funds
• Unexpended payroll funds and student stipends cannot be reallocated to other uses
• In addition to programmatic responsibility, the PI is responsible for the financial management of the grant including payroll, human resources and purchasing.
Funded Clusters

Through two rounds of competitions we received 12 proposals and funded five teams of USM faculty and students from the sciences, technology, arts and humanities who have come together with industry and community partners to conduct research ranging from how Maine businesses should address cyber security breaches to better management of chronic illnesses through the use of information technology.

These clusters are engaging over 20 faculty and staff members from all four of USM colleges and over 25 academic departments, along with several undergraduate and graduate students and eight external partners.
Health Lifestyle Management Technologies

*Schools/Departments:* Nursing, Social and Behavioral Sciences, Computer Science, Technology, Exercise Health and Sport Sciences.

*Partners:* Community partners in Nutrition, Population Health, and Big Room Studios.

*Purpose:* Develop and pilot a technology-based lifestyle management system.

*Current Status:*
- Initially, the cluster will track and help manage weight as an indicator of chronic illnesses.
- Completed first pilot study with data analyses on-going and is gearing up for the second pilot.
- Preliminary results suggest no significant difference between pre and post intervention. This may be a result of sample size, as recruitment of participants was an issue.
- Learned much about what students think are facilitators and barriers to healthy eating, and they will use this knowledge to improve the second pilot.
- Plans to improve participation include early recruitment and implementation of strategies to foster more interaction between participants.
- Identified an NIH-NINR program for funding to further test the system’s application to other areas of chronic illness.
Digital Maine

**Schools/Departments**: Arts, English, History, Library Services, Computer Science, Geography/Anthropology.

**Partners**: Maine Humanities Council, Blue Marble Graphics, NBT Solutions.

**Purpose**: Harness digital technologies in such a way that a variety of research is more accessible to a much wider audience.

**Current Status**:  
- Working on diverse topics, ranging from the impact of a rise in sea levels to the labor history of Maine’s paper mills, through the development of new software applications and the use of geospatial technologies.  
- Two subprojects are underway – one focused on envisioning sea change, and a second focused on digitizing a women’s history trail in Maine.  
- Hosted an internationally recognized digital humanities scholar to campus to offer suggestions for improvement of the cluster.  
- The faculty team needs to work to ensure that the cluster is not simply viewed as a digitizing service, but a collaborative interdisciplinary research cluster.
Web-based Systems to Support Disadvantaged Populations

**Schools/Departments:** School of Social Work, Computer Science, Technology, Communication and Media Studies.

**Partners:** Maine College of Art, Maine Medical Center’s Barbara Bush Children’s Hospital, Maine’s Office of Information Technology, and Poland Spring.

**Purpose:** Provide opportunities for disadvantaged youth campers to stay connected all year with a critical web-based support network.

**Current Status:**
- Pilot project focuses on Camp Susan Curtis, a Maine camp for children in poverty.
- The first pilot in the form of a private social network did not effectively engage the population, so they have made engagement a top priority for the next pilot.
- The second pilot is currently ongoing, and a stronger sense of place has been created with virtual reality, in collaboration with a business partner.
- An issue is access to campers after the summer months for data collection and assessment purposes.
- Faculty have begun to identify the cluster’s next target population.
Cybersecurity

*Schools/Departments:* Philosophy, Communications and Media, Technology.

*Partners:* See below.

*Purpose:* Support research and education on workplace ethics and strategic communication important for data security.

*Current Status:*  
- Folded into the Maine Cybersecurity Cluster (MSCS), which has a much larger vision encompassing all aspects of cybersecurity research and education and a broader base of federal, state, and local public and private partners.  
- Serves as a research, education, and training resource for the state.  
- Its Academic Excellence in Information Assurance application is under review by the NSA.  
- Operates the Cyber Security Laboratory, the only one of its type in Maine, as a shared and secure testing and evaluation environment for private and public entities.  
- Received NSF funding to pilot an inter-institutional virtual cyber security collaborative learning laboratory as a shared educational environment that provides students in different locations the opportunity to gain practical collaborative experience in preventing and mitigating cyber attacks in real time.
Health Informatics

**Schools/Departments:** Computer Science, Muskie School of Public Service.

**Partners:** HealthInfoNet, Maine Health Management Coalition.

**Purpose:** Develop solutions for linking and analyzing big health data to improve health care delivery and quality and respond to local industry and community needs.

**Current Status:**
- Maine is on the cutting edge for many health data developments, including having the only operational, statewide Health Information Exchange, and one of the first all-payer claims data warehouses.
- Size, scope, and design of health data systems have created numerous challenges to data access and operability, including uses for research and changes to clinical practice.
- Cluster will tackle these and other big data problems in health care delivery, financing, and population health.
- Representing faculty and staff from two colleges, three degree programs, and two research programs, cluster members reflect a diverse body of knowledge and an extensive theory-based and applied research portfolio with clear relevance to health informatics and health care system performance.
## Lessons Learned

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<tr>
<th>Areas to Address</th>
<th>Solution</th>
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<td>Faculty did not understand the meaning of and dynamics of a research cluster and how to develop one.</td>
<td>Schedule a presentation on research clusters immediately after the release of the request for proposals.</td>
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<tr>
<td>Lack of faculty experience in developing relationships with business and industry partners</td>
<td>Schedule meetings with the Office of Advancement to help faculty make connections and develop mutually beneficial relationships with external partners.</td>
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<td>Visioning and goal setting are not strengths of faculty who tended to be over ambitious in the context of seeding research clusters. Consequently, transforming vision into reality including identifying critical resources and critical mass of faculty needed for implementation were challenges.</td>
<td>Schedule a presentation on research clusters immediately after the release of the request for proposals.</td>
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<td>Lack of proposal writing skills was evident, and instructions were not followed.</td>
<td>Require applicants to attend grant writing workshops as a condition of award and to stress the need to follow instructions during the informational session.</td>
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<td>Budgets were incoherent and instructions were not followed.</td>
<td>Require applicants to work with OSP to develop budgets for their cluster proposals.</td>
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| External review process was faulty in that reviewers had no appreciation of the USM environment. | • Restrict external reviewers comments to the strengths and weaknesses of the proposals without scoring.  
• Provide applicants the opportunity to respond to externals reviewers’ comments during oral presentations to the Internal Review Panel. |
Lessons Learned

Faculty Perspective
Faculty have reported that learning how to work together in an interdisciplinary team, and with external partners is an evolving process that takes time.

They are all extremely positive about what they have gained by coming together with colleagues from different disciplines, and now truly appreciate that working together is powerful – the sum is better than its parts.

They also acknowledge that working with interdisciplinary groups requires extensive and constant communication in order to create unity, but the benefits far outweigh the time involved.
Lessons Learned

University Research Management Perspective
The research clusters have succeeded in bringing together interdisciplinary groups of faculty with common interests who would not otherwise have initiated collaborative research projects.

The clusters have not only received substantial financial support, but also the time and expertise of the staff in Research Administration and Advancement.

We were unprepared for the faculty’s lack of expertise in setting goals and measurable objectives, and in understanding how a research cluster needs to be more than a sum of its parts.

Addressing these issues required considerable time on our part, and delayed the progress of the first group of funded clusters.

Thus, this competition was a learning process for all involved.
Conclusion

Although the clusters are less than two years old, we hope that this model will continue as a way to focus and leverage USM’s scholarly strengths while developing solutions to the most pressing issues facing our region.
References


