Wilder Research

Executive Summary

2011 Evaluation of the Centers of Excellence

A Minnesota State Colleges and Universities Initiative

Four Centers of Excellence were created in 2005 as part of the Minnesota State Colleges and Universities system. They were an initiative of the Governor and enacted by the legislature with initial funding of $5 million per year for the first four years. The four Centers are:

- **360º Manufacturing and Applied Engineering Center of Excellence** (lead university: Bemidji State University)
- **Minnesota Center for Engineering and Manufacturing Excellence (MNCEME)** (lead university: Minnesota State University, Mankato)
- **Advance IT Minnesota** (lead university: Metropolitan State University)
- **HealthForce Minnesota** (lead university: Winona State University)

The Centers are charged with multiple purposes. With their unique structure they can accomplish a number of important functions that are less readily accomplished by traditional institutions. These distinctive capacities align closely with the strategic directions of the system, as shown in the figure below.

Summary of conclusions

The findings of the 2010-2011 evaluation support the following conclusions about the operations and impacts of the Centers to date.

Outreach work continues to expand in scale and strengthen in effectiveness

- Besides strong outreach to traditional students, efforts are growing to reach out to nontraditional learners (dislocated and incumbent workers).
- The engineering component of Project Lead the Way may be approaching a tipping point in its level of adoption. Efforts should be continued to further integrate the curriculum into the K-12 standards and recognize its college-level rigor.

Centers continue to engage a strong set of industry partners

- Centers have different structures for engaging industry. No single model appears to be most effective. Hands-on industry participation to identify needs and help to prioritize (but not design or dictate) solutions appears to be most helpful in maintaining energy for ongoing participation.

ALIGNMENT OF THE STRATEGIC DIRECTIONS OF THE SYSTEM AND THE DISTINCTIVE CAPACITIES OF THE CENTERS

Strategic directions of the system	Distinctive capacities of the Centers
1. Increase access, opportunity, and success	Help learners discover and prepare for careers in center aligned fields
2. Achieve high-quality learning through a commitment to academic excellence and accountability	Encourage cross-campus activity to strengthen courses, programs, and learning opportunities
3. Provide learning opportunities, programs and services to enhance the global economic competitiveness of the state and its people	Strategically expand and strengthen pathways for communication among all partners including industry, education, and learners Identify industry opportunities and the related workforce preparation these opportunities require
4. Innovate to meet current and future educational needs	Champion changes in the content and delivery of educational programs and services
5. Sustain financial viability during changing economic and market conditions	Produce revenue and leverage additional resources

Centers are helping to increase institutional collaboration across the system

- Cross-campus relationships are growing stronger and expanding. New institutions are becoming involved even if they are not formal partners, bringing more of the resources of the system into play to meet industry needs.
- Center-to-Center partnerships are expanding from sharing ideas to also include joint projects.

Centers' status independent of specific programs and departments helps them promote innovation

- They are able to use their position to be neutral conveners and arbiters.
- They can use funds to promote priorities that are essential to an industry sector but do not rise to the top for any individual institution.
- They can use funds to cover early risks, incubate innovations during a period of piloting and development, and allow them time to grow and take hold.

Fiscal arrangements are not yet consistent

- Non-standard job descriptions for Center staff make it hard to appropriately rate positions for competitive pay. This, combined with the inability to guarantee multi-year job availability, makes recruiting Center staff challenging.
- Most financial arrangements (through host universities) appear to be working smoothly. However, the reliance on standard policies can sometimes limit Centers' ability to innovate to become more self-funding.

Champions matter for innovation, and are needed at both institutional and systemwide levels

- Centers function both within and next to institutions. This allows them to act as quasi-peers to promote innovation at the program and institutional levels, with the partnership of faculty and administrators who help champion the work.
- An increasing share of Center efforts now have system-wide impact and depend on follow-through at the system level. Center and institutional staff are less effective as champions at this level.
- Research on innovation in industry shows it is important to have high-level leadership that manages the relationships between standard and innovative parts of the overall organization. This leadership is also needed to help support the mainstreaming of successfully piloted innovations into the wider organization.
- Since the formation of the Centers, many staff in the system office have worked with Centers and their academic partners and helped to support their work. Given the continued evolution of the Centers, and the reduction in central office staff, this would be a good time to re-examine what kinds of system-level capacity and relationship with the Centers would best serve the Centers' and system's needs going forward.

Findings on 2010-2011 impacts

Strategic Direction 1: Increase access, opportunity, and success

This strategic direction includes outreach to K-12 educators and students, development of career and technical education opportunities, and outreach to non-traditional and underserved students.

Centers continue to increase the scope and variety of outreach efforts, both to traditional and non-traditional students. Based on surveys of participants, 2010 summer camps were more effective than 2008 camps in increasing students' confidence in science, technology, engineering, and mathematics (STEM) skills, interest in the field, and awareness of careers in the field.

Strategic Direction 2: Achieve high-quality learning through excellence and accountability

This strategic direction includes efforts in joint training and industry outreach, as well as internship opportunities and work to promote the development, articulation, transfer, and sharing of courses and programs.

Except at one Center (360°) the pace of creation of new courses appears to have slowed slightly over the past two years. However, new programs have been created at an increasing pace, and these new programs are increasingly coordinated across institutions.

Most new programs are too new to have produced graduates to date. However, in the courses that Centers helped to create or modify, enrollments since 2006 have totaled over 2,200 students.

Strategic Direction 3: Provide learning opportunities to enhance global economic competitiveness

This strategic direction includes the Centers' system-wide role in addressing issues for their own industry sectors, facilitating responses including program development to meet industry workforce needs, and convening industry and educational groups as needed. Activities for 2011 included development of online multi-campus courses and programs; development of specialized "middle-skills" offerings; and convening of multi-institutional meetings between industry and academic representatives.

Centers continue to expand their relationships to industry and public agencies. The processes for working with these partners vary greatly among Centers, reflecting differences in industry sectors and Center histories and cultures.

One measure of industry support for Centers is the level and type of their engagement. In 2010, 199 organizations contributed a total of 4,381 hours to Centers' work. Besides donated time, 32 donated equipment or other in-kind resources, 4 made cash financial contributions, 11 hosted student interns, and 8 requested research or consultation.

Strategic Direction 4: Innovate to meet current and future educational needs

This strategic direction includes strategic, peer-reviewed support for innovations and expansion of effective practices and support for new and/or shared delivery modes. Centers' support for innovations was assessed this year through case studies, described in a later section.

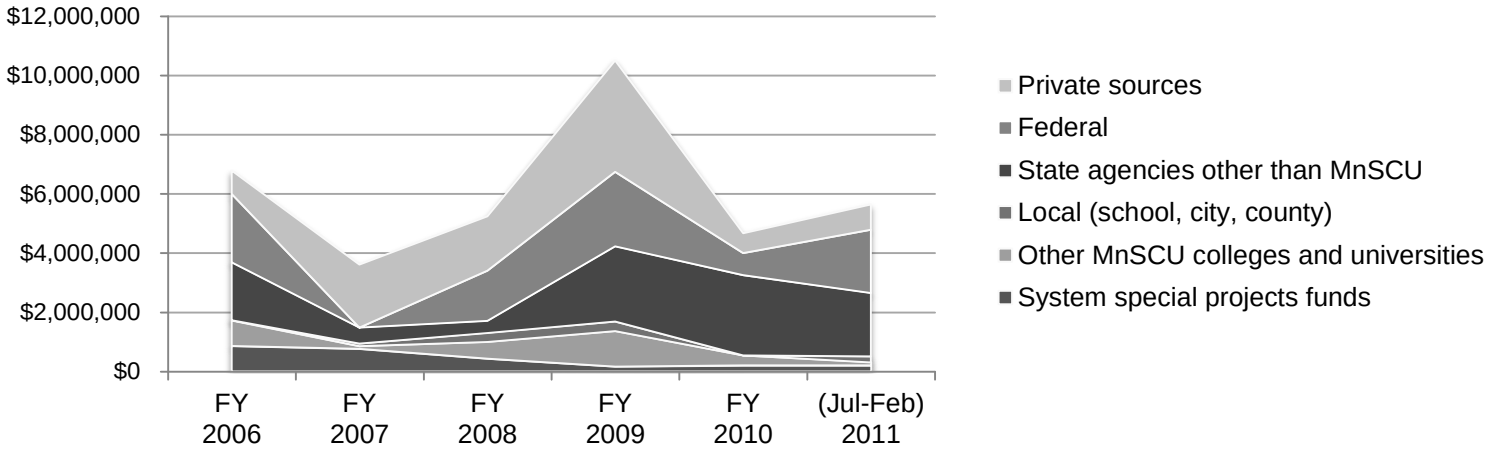
Strategic Direction 5: Sustain financial viability during changing economic and market conditions

This strategic direction is of interest to the system office in order to support funding diversification within each Center.

Centers continue to bring in, or help their partners bring in, more outside dollars than the amount awarded in the base funding from the Board of Trustees. (Figure below.) Two Centers (360° and Advance IT) are showing more success than the others in securing funding that can support ongoing Center operations, while the other two report that most of the leveraged funds go to specific activities of Center partners.

The total amount of leveraged funding, and the mix of sources, continues to vary considerably from year to year. Based on funds received through the first eight months of 2011, the Centers had already exceeded 2010 totals and appeared to be on a pace to have their second-most successful year since they began.

LEVERAGED AND MATCHED FUNDS BROUGHT IN BY OR BECAUSE OF CENTERS, BY YEAR AND TYPE OF SOURCE



Findings on innovation

As part of the 2010-11 evaluation, Wilder Research undertook a "mini-case study" in each Center. Each examined an initiative that could be considered an incubator, representing a new approach at a small scale, with the potential for expansion. Case studies explored the process of innovation including its context, challenges encountered, and factors that helped promote success. The initiatives described in the case studies are the following:

- **360°:** Development and implementation of a suite of online, cross-campus courses, organized into new certificate programs, and offered as part of a multi-campus partnership called "eTECH."
- **MNCEME:** A new collaboration between two-year and four-year instructors within the civil engineering field in which students at both levels gain hands-on experience with the contracting process and how each type of professional adds value to the other's work.
- **Advance IT:** The SAP (Systems, Applications, and Products in Data Processing) Partnership and Curriculum Project, a response to an urgent industry need for workers trained in a rapidly emerging content area.
- **HealthForce:** The process of developing the Health Science Associate of Science broadfield degree, a statewide common curriculum plan that allows students to transfer 60 credits of coursework in the general health sciences and general education to a four-year program in a specific healthcare discipline.

Factors that promote innovation

The following factors were observed in multiple case studies as helping to promote innovation. A combination of these factors seems to be most effective in moving innovation forward:

- Relationship building through networking
- Having an "insider" as a leader within the system who is also a neutral point of contact to bypass political issues
- Collecting and using good data to better understand industry needs, partners' attitudes, successful approaches elsewhere, etc.
- Access to additional and/or external resources that can be dedicated to needed areas. The access may require specific skills, relationships, time, and/or logistics

Barriers to innovation

The barriers to innovation were more varied than the supportive factors, and depended more on the specific type and location of the effort. The following factors were observed as slowing or limiting the success of innovative efforts:

- Scarcity of resources, particularly staff time
- Difficulty maintaining adequate coordination and momentum of multiple partners over an extended period of time
- Limits to how widely the potential partners share a sense of priority or urgency for the innovation; loss of enthusiasm when the project requires changes in resource allocation or bureaucratic requirements
- In some but not all cases, fear of increased cost or loss of revenue

Adoption of new curriculum or new delivery methods also requires faculty and students – and ultimately employers – to think differently about when and how learning occurs, and the conditions needed for the acquisition of high-quality skills. Change in these attitudes is likely to take considerable time. It will be helped by successful results from initial efforts such as those described in the case studies.

Unique features of Centers that make a difference

The case studies illustrated certain unique features of the Centers that allow them to advance innovations within the system that other entities (institutions or departments) are less well positioned to accomplish on their own:

- Centers have time, resources, and staff dedicated to specific goals related to industry workforce needs and promoting relationships and innovation. Institutions and departments have other primary obligations.
- Center leaders combine knowledge of the higher education system with knowledge of their specific industry sector. This combination helps them facilitate relationships and information sharing among the different sets of partners.

- Centers can use their own funds when needed to reduce risks in the early stages of new projects. At least two, and possibly more, of the innovations studied would likely have been cancelled early in their development if institutional partners had had to bear the costs or the risk of losing funds on an undersubscribed offering. The Center can use its funds as venture capital to help keep early stage efforts afloat until they reach a tipping point and can operate with only the usual sources of support.

A review of the research literature found that lessons learned from innovation in industry align remarkably well with what we have learned from the work of the Centers of Excellence since 2006. These include:

Recognize the importance of innovation
The Centers of Excellence have been an important voice within their associated programs and institutions for collecting information on the needs of industry. They have helped elevate partners' awareness of the urgency of industry's need for innovation in educational programs and processes. They also facilitate the link to economic development efforts called for by many national policy researchers.

Generate new ideas by connecting across groups
All the Centers have created new networks spanning groups not previously in regular contact. Besides within their governing bodies, this is happening through other kinds of regular and ad hoc gatherings. Examples include Advance IT's faculty-industry symposium, and the convening organized by 360° to strengthen the articulation of PLTW work into the higher education curriculum. Faculty typically report that such cross-campus gatherings are stimulating and useful.

Separate innovative structures and processes
The research literature recommends separate, parallel processes to facilitate innovation by freeing it from standard control and funding processes. The Centers are hybrid organizations, partially embedded in the system's mainstream institutions but separate from the regular departments and programs. As predicted in the research, this has led to some frictions between new and regular operations. However, it has also generated a number of innovations to date, including significantly increased outreach to potential students, new and updated courses and programs, and increased alignment between programs across campuses.

As the Centers continue to develop more varied sources of income, friction around funding is likely to become more salient. To help manage this tension, the research recommends that the separation of processes include those for reviewing and approving funding for innovation.

Manage the tensions between parallel structures
The research finds that frictions can be reduced, and successful innovations more readily be brought to scale, with leadership at a level above the two parallel processes, helping to manage the relationships between them.

To date, a number of Center-led innovations have been incorporated into regular department and program operations. The scale of innovations is growing: from courses to entire programs; from linkages between pairs of programs to entire multi-institutional consortiums; and from incorporating new equipment or software into existing programs to re-thinking the entire model of how courses and programs are delivered to students.

As this scale increases, the challenges of bringing innovations into the mainstream operations also increase. This is likely to create additional responsibilities for the leadership of the overall system to manage the frictions resulting from those challenges.

Evaluation methods and data sources

Data for this report come from four main sources:

- Using a common template, each Center provided reports on their industry involvement, outreach and marketing activities, leveraged funding, noncredit activities, and curriculum development.
- Data from the system-wide records system was provided by the Office of the Chancellor to show student enrollment numbers in new courses, and graduates and awards in new programs, for those courses and programs developed with the assistance of the Centers.

- Measures unique to each Center, documenting completion of activities specific to their own work plan for 2011, were provided by Center staff from Centers' own documents. These include reports they compiled, web statistics, records of funds awarded for various purposes, and narratives based on their own or others' personal involvement in activities.
- The mini-case studies were compiled based on information gathered by Wilder Research staff through telephone interviews during February and March, 2011. Selection of initiatives to study, and informants to be interviewed, were determined jointly by the Center directors and Wilder evaluators. Four to six interviews were completed for each case study.

Wilder Research
Information. Insight. Impact.

451 Lexington Parkway North
Saint Paul, Minnesota 55104
651-280-2700
www.wilderresearch.org

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For more information

This summary presents highlights of the *2011 Evaluation of the Centers of Excellence*. For more information about this report, contact Ellen Shelton at Wilder Research, 651-280-2689.

Authors: Ellen Shelton, Brian Pittman, Denise Huynh, and Greg Owen

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