



*CAMPUS PRIORITIES:
CHARTING A CLEAR
VISION FOR 20/20*

UNIVERSITY OF NEBRASKA OMAHA

FEBRUARY 2012

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CAMPUS PRIORITIES

CHARTING A CLEAR VISION FOR 20/20

INTRODUCTION

The University of Nebraska Omaha community understands that meeting the goals of a metropolitan university of distinction with 20,000 students by the year 2020 presents both challenges and opportunities.

Simultaneously increasing enrollment and educational quality will require strategic investments that leverage the campus' current strengths and position it to take full advantage of exciting potential growth areas. Five areas were designated as key campus priorities to spearhead efforts to reach the 20/20 milestone.

The university enlisted faculty and staff committees to write "white papers" on how undertake action plans for the areas of Doctoral/Graduate Research; Early Childhood/Child Welfare; Global Engagement, Science, Technology, Engineering and Mathematics (STEM) Initiatives, and Sustainability. This report summarizes and provides data from those papers.

The overarching imperative directing all considerations of these five emphases is to draw upon the inherent and unique strengths of UNO, especially in providing an interdisciplinary framework in which to bring each key initiative to fruition. This report will both identify current abilities and activities with each of the five areas and will recommend how best to move forward.

In meeting the university's designation of a Carnegie Research Institution, UNO has merely scratched the surface of its abilities to expand its doctoral programs and graduate research. Not only do graduate programs provide the environment in which university reputations are built, they also expand the institution's ability to absorb more undergraduates and provide them with the opportunities that tend to attract the region's best and brightest students.

UNO has provided study abroad experiences for merely a fraction of its students. In today's global marketplace, this clearly is unacceptable. UNO recognizes that exposure to diverse cultures and environments, whether through overseas experience, contact with international faculty and students, or international research collaborations, is essential to building a campus culture that is enlightened and globally competent.

The university can only advance as a respected metropolitan education and research institution of the 21st century through a strong STEM program. Advancement in STEM programs encompasses a campuswide, interdisciplinary commitment and aggressive community outreach effort that includes K-12 education.

As the metropolitan area's top education institution, UNO recognizes its responsibility and leadership priorities in enhancing the full spectrum of P-12 education. Not only is UNO the alma mater of many if not most of the area's P-12 educators, the university is the strongest resource educators have at their disposal. Investment in P-12 education and child welfare, particularly at the earliest stage, provides benefits that can be measured by reduced remedial efforts at the college level, a more productive and culturally aware community, and an enhanced image of UNO as an indispensable community treasure.

Finally, the need for organizations to develop a sustainable approach to resource use that improves productivity and reduces the strain on local infrastructure and environmental capacity is especially critical in urban settings. UNO, at the center of the metropolitan region, is well-positioned to be a catalyst for learning, engaged research and community service that allows the metropolitan area to meet its moral responsibility to promote sustainability.

As UNO continues to develop its potential as an exceptional metropolitan university, the realities of what a great institution can and should accomplish, will shape its future path. For this university, that list begins with the five areas of emphasis, which will lift UNO firmly into the national consciousness as a model institution for the 21st Century.

DOCTORAL/RESEARCH PRIORITIES UNIVERSITY OF NEBRASKA OMAHA

SUMMARY

It is clear that a focus on graduate education generally, expanding doctoral education specifically, and celebration and expansion of UNO's research productivity is essential in achieving UNO's vision to be a metropolitan university of distinction while reaching the university's goal of 20,000 students in 2020. While there is a general sense of optimism about UNO's potential as a Doctoral/Research institution and clear progress over the last few years, there are also significant challenges and constraints that must be addressed. This report details opportunities and challenges as well as suggested next steps. Given the scope of issues to be addressed, the first next step should be a detailed study of current practices, procedures, and policies in order to eliminate barriers and improve processes.

INTRODUCTION

In early 2011 UNO was reclassified as a Doctoral/Research University by the Carnegie Foundation for the Advancement of Teaching. This new classification is a reflection of the growing importance of graduate education and research at UNO. UNO's current classification is based primarily on the number of doctoral degrees granted and is also dependent on the amount of external research funding for the campus. Maintaining this classification requires consistent production of doctoral graduates as well as focus on external funding. However, excellence in graduate education extends beyond doctoral research to include the creative activity and other scholarship that occurs on campus. The support of graduate education and research is essential in order to achieve the vision of UNO as a metropolitan university of distinction with 20,000 students in 2020. To meet these goals the university must have thriving graduate programs and nationally and internationally recognized faculty scholars.

UNO'S CURRENT CAPACITY

With final approval in early 2012 of the Ph.D. in Exercise Science UNO will grant six doctoral degrees in programs to include Criminology and Criminal Justice, Educational Administration, Information Technology, Psychology, and Public Administration. The majority of UNO's graduate programs confer master's degrees, with 46 degree programs and an additional 19 programs conferring graduate certificates. Master's programs and graduate certificate programs are and will continue to be an essential part of graduate education at UNO. These are the programs that most directly relate to workforce development and engagement with the community.

Research is an integral part of the graduate experience and successful research programs are essential to attracting outstanding faculty who in turn can recruit exceptional graduate students. At UNO the term 'research' is used broadly, as shorthand for traditional basic and applied research as well as for creative activity, community engagement, and other types of scholarship. UNO's research enterprise continues to flourish, with external funding in support of faculty and student scholarship just under \$17 million in academic year 2010-2011. This figure represents the fifth consecutive year of external funding growth and came during a year when UNO lost nearly \$4 million in congressionally appropriated research support.

Institutional support for research at UNO has increased substantially in recent years. In 2007 the position of Associate Vice Chancellor for Research and Creative Activity was created and in 2010 a Contract Specialist was added to the Office of Research and Creative Activity. The Fund for Investing in the Research Enterprise (FIRE) was initiated in 2010 to provide substantial seed funding to faculty projects with high potential for extramural funding. FIRE was funded at \$120,000 in 2010-2011 and \$150,000 in 2011-2012. The University Committee for Research and Creative Activity (UCRCA) will distribute \$100,000 in smaller grants to support faculty research in 2011-2012, up from an average of around \$70,000 in recent years. In 2011, Faculty Research International (FRI) was created to provide \$100,000 in support of faculty research collaborations with international partners. Student research has also benefitted from new institutional efforts. In 2011-2012 a student research fee will provide nearly \$500,000 in support to student scholarship through the Fund for Undergraduate Scholarly Experiences (FUSE) and Graduate Research and Creative Activity (GRACA) grants.

With the implementation of NeSIS, processes in the Office of Graduate Studies and at the program level have, necessarily, changed dramatically. NeSIS required the implementation of four major systems – Application, People Soft, Image/WebNow, and Degree Works. As a result, an enrollment specialist (August 2010) and office assistant (August 2011) have been added to the Graduate Studies staff paid for through Enrollment Services Fees. Numerous changes in processes have been and will continue to be made in order to improve service to potential and current students as well as the graduate program staff. These changes include developing a print and .pdf graduate catalog (Fall 2009) and organizing the program material for the years 2004-2008 when there was no printed or electronic graduate catalog; analysis and revision of staff job responsibilities, (summer 2011) redesign of Website (on-going), application FAQs (print, electronic), inquiry database and reply system (begun Fall 2011), and, beginning Fall 2011, addition of a communication specialist (currently part-time/temporary but will move to full-time in February) to design and implement a recruitment/marketing plan for graduate studies (first advertisement in UNO Magazine Fall 2011).

Over the past three years, Graduate Studies has used its existing resources to provide more direct student support. In 2009-2010, approximately \$10,000 was allocated for graduate student travel to conferences (\$500 per student presenting at regional, national, or international conference). \$20,000 was spent in 2010-2011 and, to date, \$20,000 for 2011-2012. These dollars are from reallocation and savings within existing graduate studies accounts. In 2010-2011 and again for 2011-2012, Graduate Studies has supported (by providing a part-time faculty replacement) a consultant in the UNO Writing Center specifically for graduate students. Additionally, in 2011-2012 Graduate Studies, with the assistance of the Center for Faculty Development, is offering workshops for graduate students in oral presentation and writing of conference papers. Graduate students will benefit from the student research fee but, unfortunately, there will only be about \$60,000 specifically for graduate students. Prior to 2009, there was \$5000 a year maximum allocated for graduate student research and travel so improvements have been made in recent years.

UNO's graduate programs align closely with its metropolitan mission. In the development of new graduate programs, for example the Ph.D. in Exercise Science and the M.S. in Information Assurance, the programs emphasize interdisciplinary connections and community needs. Graduate certificates have been developed specifically to meet workforce demands as well as serve as recruitment for master's programs.

As in graduate education, the hallmarks of UNO research are innovation and cross-disciplinary collaboration. This innovation often involves the community, not only as participants in the activity, but as true partners involved in the design of the project and long term beneficiaries of the results of the research activity. This 'scholarship of engagement' is supported by traditional federal and state granting agencies, but gains a unique UNO flavor with substantial support from the city of Omaha, local and regional philanthropies and other non-profits, and business partners. UNO's diverse base of research supporters and constituents make possible innovative and collaborative approaches towards research taken by UNO's faculty. These activities in turn mark the institution as an emerging metropolitan center of scholarship and graduate education.

CHALLENGES AND OPPORTUNITIES

UNO is indeed emerging, with some programs that are fully formed and nationally competitive in both graduate education and research, some programs that are moving into national recognition, and some programs that will require additional focus and nurturing in order to achieve prominence. The maintenance, growth and development of all these categories of programs is essential to the maintenance of UNO's Doctoral/Research University classification and to the continued establishment of UNO as one of the nation's top metropolitan universities.

The emergence of UNO in research and graduate education is not without challenges, however. External funding lags behind seven of UNO's peer institutions for which external funding figures are available. Similarly, UNO does not provide the graduate student support services and opportunities or the resources for promoting graduate education as our peers. Conversations with faculty stakeholders revealed a great deal of optimism and enthusiasm about the future of UNO, but also brought to light numerous impediments to future achievements. Perhaps the most striking aspect of these conversations is the complexity of the challenges and opportunities and the ways in which graduate education and research are inextricably intertwined with other goals and priorities of the campus.

Limited resources devoted to both research and graduate education were identified as primary concerns by faculty. Recent allocations of resources to faculty seed grant opportunities (FIRE, FRI, UCRC) are viewed as positive forces moving research forward on campus, however these efforts need to receive a long-term budget commitment so that faculty can base research plans on the availability of these opportunities. The increasing demands of external funding agencies for collaborative

research programs increases the complexity of writing competitive grant proposals. A grant development specialist based in the Office of Research and Creative Activity would help faculty assemble, develop, coordinate and write grant proposals, increasing the volume and quality of UNO's funding requests. Greater staff support for both pre- and post-award functions as well as faculty development opportunities at the campus and college level for enhancing research and grant productivity are common practices at comparable universities.

Inadequate funding for graduate assistantships is perceived as one of the primary impediments to growing graduate programs at UNO. Graduate stipend amounts are not nationally competitive, making attracting the best students to UNO exceptionally difficult. A one-size-fits-all approach to increasing stipends is not seen as the solution to this problem, rather stipends should be determined based on the field of study and the degree program. Stipends paid from grant sources should not be limited to the university rate and the university should encourage grant funding of graduate students by waiving tuition for students supported in this way. Considerable attention should be given to growing the number of assistantships supported by the university and to the allocation of assistantships among units. Objective criteria for assigning assistantships to units, in keeping with university priorities, should be developed and assignments should be reviewed periodically.

In addition to increased stipends the university should provide more opportunity for student development by providing statistical support, greater opportunities to travel to conferences, and more funding for graduate student research. Additional activities and support may also include an active graduate student association with accompanying student-led/generated programming. Curricular changes or degree additions are perceived as being stifled by a bewildering layer of approvals that need to be clarified and simplified and, where possible, eliminated.

Cultural changes need to take place in the research realm. The decentralized nature of the university leads to mixed messages in which faculty and students in one unit are told that an activity is impermissible while that very same research-related activity occurs in another unit on campus. An example is the inconsistent approach to allowing Facilities and Administration (F&A) dollars to be carried across fiscal years by faculty researchers. A series of best practices related to research and graduate education should be developed for the university to avoid inconsistencies and attendant frustrations. Although the F&A distribution formula has been clarified in recent years, a great deal of uncertainty remains in how F&A is generated and used on campus, particularly at the

level of the colleges. Greater transparency in how F&A is generated and spent will assure faculty that F&A is being used to support research across campus.

Changing the culture of research and graduate education at UNO also requires a consistent and clear message from campus leadership. The twin campus goals of increasing enrollment to 20,000 and emphasizing research and graduate education seem antithetical without a clear map to achieving both goals. Current workload assignment practices in most units do not provide adequate support to the most productive (or potentially productive) researchers, hindering the ability of these faculty to conduct research, compete for external funds and train students. However, removing instructional duties to support research makes difficult the need to support the instructional needs of a growing student body. Many faculty recognize that student research opportunities (e.g., FUSE, GRACA) can attract top quality students and that increased graduate enrollment will help UNO meet the 20,000 student goal. However, those same faculty are convinced that the university's approach to instruction and research must fundamentally change. To this end, faculty workload assignments need to be reflective of research productivity and graduate student mentoring, especially with doctoral students. Additionally, UNO should explore, where appropriate, hiring faculty who are dedicated to and rewarded for instruction, especially undergraduate. Faculty workload should be aligned with the teaching, research, and service goals of the unit and productivity and strengths of the faculty.

In addition to being creative with and valuing equally a variety of workload assignments, campus leadership should also strive to hire with the long term strategic interests of academic units in mind. Practices of automatic in-kind replacement of faculty should be discouraged in a rapidly changing academic world and approval of positions should be based on future unit strengths in research and graduate and undergraduate education rather than focusing exclusively on the needs of the current curriculum. Hiring decisions may require reevaluation of the unit curricula to focus on priority areas.

The on-campus excitement about the future of UNO is palpable but the ultimate key to the success of the university is the enthusiastic support of the community, the state and the region. UNO's current interactions with the community are strong, with thriving partnerships in service learning and community engagement that bring external funding to campus, provide the opportunity for graduate research projects and serve the community at large. However, the perception of UNO in the community suffers greatly from inadequate and inconsistent messaging and marketing. UNO is perceived as an undergraduate teaching institution and members of the community are genuinely

surprised to hear that our faculty and students conduct research of international importance and participate in doctoral programs. This perception is changing but not rapidly enough to support and sustain UNO's growth. As the university looks to developing and growing research and graduate education there should be an emphasis on tailoring these programs to the needs and the strengths of the Omaha metropolitan area and the state to Nebraska. Such efforts will allow a greater range of the community to experience the practical benefits of sharing a city with a doctoral/research university and create willingness among donors and corporations to engage with the university in privately funded research and educational partnerships.

But building programs is not enough. The university must take a more proactive approach towards publicizing the successes and future plans for graduate education and research. The goal of this publicity goes beyond creating a favorable impression of the university in the eyes of the community; it extends to the state's political leaders and to the leaders of the University of Nebraska system.

With regards to research, UNO suffers from an inequitable distribution of state resources. A small fraction of monies from the Nebraska Research Initiative and Nebraska EPSCoR, support UNO faculty research efforts. Most of these funds go to UNL and UNMC. In part, this is due to history; in part it is due to the perception of the University of Nebraska system and state leaders that UNO does not have a serious research enterprise. To some degree this perception creates a self-fulfilling prophecy. By starving UNO from research resources, this lack of support helps to ensure that UNO does not live up to its research potential. Future resources from system-wide initiatives such as the Dougherty Water for Food Institute and the Buffet Early Childhood Institute are also in jeopardy if UNO cannot effectively publicize its successes, goals and potential to leaders in the university, community, region and state.

CONCLUSION

Increasing the quality and productivity of graduate education and research programs is essential to UNO's goal of becoming one of the nation's premier metropolitan universities. Top faculty and top graduate students are drawn to excellence and in turn draw external resources and prestige to the institution. UNO should capitalize on its recent reclassification as a Carnegie Doctoral/Research University. The university has excellent faculty, staff and facilities and a dynamic and productive relationship with the community that can serve to continually grow the innovative and collaborative research and education efforts that are the hallmarks of UNO.

To facilitate the growth of doctoral education and research the university should review policies, procedures and support mechanisms used by peer institutions and aspirational peer institutions. The results of these analyses should be used to fashion best practices in support of graduate education and research at UNO.

In addition, the Office of Research and Creative Activity and the Office of Graduate Studies should develop a joint communication plan to promote research and graduate education. This plan will reflect the interdependent nature of graduate education and research.

Assessment of progress in research is straightforward and based on increases in external funding for scholarly activities at the university and the production of scholarly works by faculty and students. The efficacy of programs in support of research (e.g., FUSE, FIRE, UCRCA) should be included as part of this assessment.

Graduate education will be assessed on the numbers of students applying, enrolling and graduating from UNO programs. In addition the assessment should focus on internal and external recognition of graduate faculty, programs and students.

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**EARLY CHILDHOOD/CHILD WELFARE (ECCW)
UNIVERSITY OF NEBRASKA OMAHA**

SUMMARY

ECCW responds to the need for comprehensive integrated systems of services designed to give all young children (birth through age eight) access to what they need in the early years to succeed in school. In this context, UNO recognizes ECCW as critical to its metropolitan university mission. Further, UNO must come together with early childhood service providers, P-12 districts, parents, policy makers, other University of Nebraska campuses, community service agencies and businesses to improve learning and developmental outcomes for all children, with emphasis on children who are at-risk and those with special needs.

INTRODUCTION

The state of Nebraska is poised to become a national leader in an integrated approach to the field of early childhood through the Buffett Early Childhood Institute (BECI). In the metropolitan area, Building Bright Future's (BBF) mission is to "measurably improve lifelong educational outcomes for every child by mobilizing a comprehensive network of community resources." At the same time, UNO is becoming a "metropolitan university of distinction" in part through its many contributions to Early Childhood and Child Welfare. The university has the opportunity to bring together and capitalize on the unique contributions of multiple disciplines (see Appendix A) to promote positive development and growth in early childhood. In particular, the areas of opportunity at UNO in ECCW are the establishment of an Interdisciplinary Early Childhood Policy, Practice and Research Consortium (IECPPR) and an Open Institutional Repository.

There is a need for increased communication and collaboration in the area of ECCW. This paper identifies potential next steps which include: formalizing an IECPPR Consortium, increasing recognition and support for innovative IECPPR Consortium activities, increasing IECPPR external funding efforts, and enhancing internal investments in IECPPR.

UNO is able to contribute to the local BBF and statewide BECI initiative and provide leadership at the state and national level.

ISSUES

Decades of research have established the years from birth to age 8 as the period during which children make their greatest gains in cognitive, behavioral, language and social-emotional growth (Shonkoff & Phillips, 2000). Yet large numbers of children emerge from this period lacking the basic abilities they need to succeed in life. Most vulnerable and at risk for later failure are those many children who grow up in poverty, abuse or have developmental delays, learning, behavioral and physical challenges (Cunha & Heckman, 2007; Douglas-Hall & Chau, 2007). A collective effort of educators, scholars, policy makers, and community agencies is needed to address these complex issues.

Coordinated efforts around research, practice, professional development, and policy can have a significant impact in the state. The urgency for this effort is clear. According to Nebraska State Department of Education figures (Christensen, 2008), since 1990:

- The number of Nebraska children living in poverty has increased 62%
- The number of children growing up in families where a language other than English is spoken has risen 275%
- The number of young children identified as having a disability has grown 72%

Additionally, only 20.6% of the 4-year-olds and 12.1% of all 3-year-olds are enrolled in a high quality state-supported pre-kindergarten program, Head Start or Pre-K special education program (NIEER, 2009).

UNO must continue to play a significant and expanding role in the improvement of opportunities for young children to succeed. This is consistent with UNO's metropolitan mission and consistent with its community and statewide initiatives already underway.

UNO CURRENT CAPACITY

UNO's metropolitan mission is well aligned with the strengthening of ECCW efforts. UNO is promoting evidence-based best practices and enhancing its capacity to serve the community in an ECCW leadership and policy role (see Appendix A). Current capacity for the ECCW priority includes:

- Multidisciplinary initiatives that represent diverse and varied interests. This is consistent with both the UNO Strategic Plan and the OASA Priority Initiative. An investigation of lead in Omaha soils provides an example: Soil samples were collected by geology students, processed by chemistry students, and analyzed by James Carroll and colleagues. A student made the public presentation of the findings earlier this semester. Lead is particularly toxic to young children and is especially hazardous to those who play in yards and playgrounds.

- Faculty have a history of influencing policy that impacts the welfare of young children.
- Faculty are involved in policy, research, community engagement and teaching that spans from infancy through early childhood (birth through age 8) and this focus is consistent with the Buffett Early Childhood Institute's priorities. Schools, departments and programs include (and are not limited to): Chemistry, Criminal Justice, Environmental Studies, Foreign Languages and Literatures, Geography/Geology, History, Music and Visual Arts, Nebraska State Data Center, Physics, Psychology, Social Work, Sociology and Anthropology, Special Education and Communication Disorders, Teacher Education, Women's and Gender Studies, and the UNO Child Care Center. (See Appendix A for more information.)
- UNO has an applied focus on not only understanding the early childhood issues that families face, but on helping families and the wider community. Service learning and community connections are two of UNO's strengths.

UNO AREAS OF OPPORTUNITY

UNO is becoming a "metropolitan university of distinction" and in the context of that evolution, ECCW is an opportunity for interdisciplinary, proactive support for children and families that includes prevention and targeted intervention with the ultimate goal of diverse, healthy families. UNO's areas of opportunity lie in the intersection of policy, practice and research.

UNO should establish an Interdisciplinary Early Childhood Policy, Practice and Research Consortium that will bring together experts in Early Childhood who will develop policy, conduct research and partner with the community to provide services to young children and their families, especially those who have financial limitations, lack resources, and children with developmental disabilities. Different experts will define early childhood in different ways and these varied approaches will enhance the well-being of young children in the formative years. The goals of the Consortium are to:

- Expand partnerships with community and state initiatives, e.g., Building Bright Futures and the Buffet Early Childhood Institute
- Increase Recognition and Support for Innovative IECPPR Consortium Activities
- Increase IECPPR Consortium External Funding Efforts
- Enhance Internal Investments in IECPPR Consortium

UNO should also develop an *Open Institutional Repository* at Criss Library that will enhance access to the intellectual products of UNO and the Early Childhood Consortium members. The institutional repository can:

- Showcase early childhood research and community activity from UNO
- Enhance access to UNO early childhood research and community activity through search engines and databases
- Assess usage of UNO intellectual activity in the area of early childhood and related areas through the monitoring of access to resources

POSSIBLE IECPPR CONSORTIUM ACTIVITIES

- *Early Childhood Literacy Lab*: Partner with schools to provide intensive, experience-rich literacy instruction for K-3 children. The lab would focus on best practices in emergent literacy supporting developmental growth in foundational learning that strengthens the capacity for learning to read and write. The STEM Priority initiative would be an integrated partner in this effort.
- *Interdisciplinary Research Assistance Center (IRAC)*: Develop a research and methodological teaching center on campus that will provide quantitative and qualitative hands-on research support to faculty, staff, students and members of the community. This center will offer periodic workshops on methods topics such as use of major data sets, innovative research methods, and up-to-date statistical methods. IRAC will support many areas at UNO, including priority initiatives like ECCW and STEM.
- *Education and Poverty Policy Center (EPPC)*: Examine local, regional and national issues related to the problem to determine the effectiveness of programs and policies to improve the ability of children in poverty achieving educational success from pre-school through college. The Center would perform policy analysis to determine causal linkages between poverty and educational success. It will also conduct assessments of barriers to implementation. The products will inform both local educational practice and national policy.
- *UNO Child Care Center*: Improve existing childcare facility, expand the age range of children to include infant care, and systematically integrate UNO's Child Care Center operations with the research and practice activities of the Consortium.
- *Expand the Educational Administration and Supervision Department*: Provide an Early Childhood Leadership option through the Educational Administration and Supervision department's advanced degree programs.
- *Parents and Children Together (PACT)*: The purpose of PACT is to provide parents with the tools needed to be effective parents, with the assumption

being parents are in the best position to teach their young children but many parents have limited opportunity to learn the most effective parenting skills. PACT would provide services to caregivers and enhance child outcomes.

CONCLUSION

Faculty, staff and students at UNO are already engaged in many varied projects and initiatives that address Early Childhood and Child Welfare. UNO should consider connecting, strengthening the resources already present at UNO, and expanding on them. The action steps proposed are:

- Formalizing an IECPPR Consortium Committee: The campus needs to formalize an interdisciplinary committee that will provide a conduit for collaboration, shared discussions, and partnerships.
- Developing the Open Institutional Repository.

The potential long term benefits of the IECPPR Consortium and Repository are increased collaboration, increased external funding, and the improved welfare of children and families across the state of Nebraska. The success of these efforts will be assessed by increases in external funding and data demonstrating improved child outcomes.

APPENDIX A: UNO Current Capacity

Introduction: What follows should be considered a partial and non-representative list. It illustrates the richness and variety of work underway on the UNO campus and is not exhaustive.

Biology

Suzanne Sollars' research focuses on developmental aspects of sensory systems. Her studies examine brain and system-wide physiological alterations in neural processes and anatomy as a result of perturbations during development. Examination of developmental dynamics in neuroscience are also ongoing projects by other Psychobiology faculty (Strasser and French) and students in the Master's and Ph.D. Graduate Program.

Chemistry

Rich Lomneth and students have measured formaldehyde levels inside energy efficient homes as part of a Zero Net Energy Home project with faculty from UNL, UNMC and Architectural Engineering. Indoor air quality, including formaldehyde levels, is a children's health concern. The group may extend the work to include the design of "healthy" child care facilities in addition to "healthy" homes.

James A. Carroll and colleagues have analyzed soil samples in the Omaha area to detect low levels of metals particularly toxic to children: specifically, lead. Statistical analysis of data on soils collected by geology students, digested by general chemistry students, and analyzed by experienced UNO faculty is complete. Adjustment for intraurban migration, and patterns of prevailing winds, might help to formulate more robust conclusions. In addition, Chemistry could support a focus on safe toys for youngsters if others were interested.

Criminal Justice

School of Criminology and Criminal Justice (SCCJ) sees early childhood development as part of an interconnected web that cannot be understood in isolation from other aspects of the social system or other phases of the life course. A team of SCCJ faculty and graduate students (with representatives from Creighton University) are currently conducting the 2011 Omaha gang assessment: A comprehensive analysis of the nature and prevalence of Omaha street gangs. One of the most significant childhood risk factors is growing up in a neighborhood where street gangs prevail. Another SCCJ project focused on early childhood involves assessing programmatic efforts to cultivate stable and healthy relationships between children and incarcerated mothers. SCCJ faculty are partnering with the Nebraska Department of Correctional Services to evaluate the agency's parenting program for female inmates.

Programmatically, SCCJ houses the Consortium for Crime and Justice Research (CCJR) and Juvenile Justice Institute (JJI). CCJR is serving in various capacities on the Building Bright Futures Attendance Collaborative. SCCJ routinely partners with various agencies responsible for promoting healthy childhood development such as the Omaha Boys & Girls Clubs of America. In recent years, SCCJ has also begun identifying partnerships with the University of Nebraska Medical Center's School of Public Health, Boys and Girls Town of Nebraska, and others.

Environmental Studies

Worm Composting at UNO Child Care Center & "Going Green" discussions with the children.

Foreign Languages and Literature

First-year second-semester students learning Spanish (SPAN 1120) with a service learning

component are helping after school programs and faith based agencies with their mentoring programs. Iluno and Japanese students read to the UNO Child Care Center children to enhance their English speaking skills. The children also participate in activities and a lunch that the Japanese students host.

Geography/Geology & Women's Gender Studies

Karen Falconer Al-Hindi's research concerns fathers and the ways they stay involved with their kids who have autism. Discovering how they do so can help other fathers, which may help keep families together. Positive family relationships contribute to child welfare and are especially important for children with autism and developmental delays or disabilities.

HPER

Dr. Nick Stergiou's Biomechanics Core Facility is conducting research on infant sitting, cerebral palsy and autism.

Josie Metal-Corbin leads a PE class for children enrolled at UNO Child Care Center.

Children ages 3-5 can enroll for swim lessons in the summer through HPER.

MavKids Summer Program: A recreational day camp for children entering first grade through age 14.

Mini MavKids Sports Program: For children ages 3 – 5, this is a six-week instructional program that helps parents work one-on-one with their children while teaching them the basics of sports: throwing, catching, kicking and batting.

History

Sharon Wood is developing an undergraduate course on the history of childhood in North America

Music & Visual Arts

UNO childcare enrollees benefit from weekly music classes led by Melissa Berke and students, as well as help with the Holiday program and graduation. Art education students have offered visual arts education lessons as well. One such lesson was the design for the Chancellor's Holiday card.

Building Bright Futures Early Childhood Services: For the past semester the music education class has provided weekly music at eight of the preschool childcare centers.

EDUCare Center / Indian Hills: Last spring three UNO art educators met with the staff of the Indian Hills Center to provide consultation on their future art plans. They provided curriculum materials, current research in early childhood development in the arts, integrated lessons and other practical/logistical advice. Also invited them to Prairie Visions workshop.

CADRE II: The Arts: For ten years the arts track of the CADRE project provided a concentration in arts education for the graduate degree in education. Over 130 teachers from seven metro districts graduated from the program (several were Headstart educators in Ralston). The drop off of most of the major districts for 2011 and the increase of the number of tracks that teachers can choose decreased the population for CADRE II to one educator. The CADRE program is one area that has potential growth in early childhood as well as the

possibility of interdisciplinary ventures in more areas than just the arts.

Physics

Aim for the Stars Math and Science camps offer students as young as 8 years old fun, hands on instruction in a “camp” environment. Director Connie O’Brien is committed to inclusion; students with a range of abilities enjoy the camp. Parents from around the U.S. travel to Omaha to enroll their students. The camp contributes to STEM education as well as UNO recruitment.

Psychology

Juan Casas studies the etiology of relational aggression and victimization in early childhood. This work has primarily focused on the early parent-child relationship as it relates to these behaviors. This work also looks at gender differences and adjustment issues for both the perpetrators and the targets of these hostile behaviors.

Jeffrey French conducts research on the impact of early environments (both prenatal and postnatal) on development in the marmoset monkey, a species that exhibits many human family-like qualities (e.g., offspring care by fathers and older siblings, social monogamy, nuclear family social structure). His research demonstrates that variation in prenatal hormone environments shape postnatal development, and early postnatal social environments contribute to stress-reactivity, a feature that has important links with disease susceptibility in humans. The research has been funded by the Eunice K. Shriver National Institute of Child Health and Human Development since 2002.

Lisa Kelly-Vance & Brigette Ryalls have developed an assessment and intervention system that uses the context of play to determine the cognitive, social and behavioral skills of young children. Research findings have shown that the assessment system successfully identifies the children who would benefit from interventions and that these interventions are very successful in a short period of time.

Jonathan Bruce Santo is studying systematic, mandated facilitation of school transitions. This an important but understudied aspect of the Reggio-Emilia approach to early childhood education that is admired internationally. He studied (with Barry Schneider, University of Ottawa, Canada; Mara Manetti, Laura Frattini and Nadia Rania University of Genoa, Italy) the links between Northern Italian transition practices and pupils' feelings about school, academic achievement, problem behaviors, internalizing and externalizing.

The School Psychology Graduate Program is integrally involved in early childhood research and training. Faculty have expertise in working with young children, educators and families. In the teaching domain, they offer a course in Early Childhood Assessment and Intervention; many other courses address improving education for young children with the goal of preventing problems. Numerous research projects focus on young children, and on providing proactive services to children, educators and families. Faculty and students have extensive publications and have conducted local, state, and national presentations addressing the needs of children from birth to age 8.

Public Administration & Community Service

The College of Public Administration and Community Service houses the Nebraska State Data Center. It has demographers with access to many sets of state data and contributes to assessment and program evaluation needs concerning early childhood/child welfare.

Social Work

Jeannette Harder is leading three projects related to early childhood and child welfare: First, growing out of her recent book, *Let the Children Come: Preparing Faith Communities to End Child Abuse and Neglect* (Scottsdale, PA: Herald Press), she has started a nonprofit organization: Dove's Nest. Its mission is to empower and equip faith communities to keep children and youth safe in their homes, churches, and communities. Second, she is leading a multi-dimensional statewide evaluation of the Nebraska CASA Association. Third, she is in the early stages of becoming a local evaluator for a Nebraska 21st Century Community Learning Center at an elementary school in North Omaha. Finally, she frequently evaluates child abuse prevention programs, like Parent Aide and Healthy Families programs around the U.S. Currently, she is working with programs in Downey, CA, and Elkhart, IN.

Sociology & Anthropology

Samantha Ammons supervised a recent Master's Thesis entitled "Social Class, Parenting Styles, and Choice of Child Care." This thesis examines how social class shapes what parents desire in child care and their satisfaction with it. Dr. Ammons and the new graduate plan to submit it for publication in Spring 2012.

Special Education and Communication Disorders

Student clinicians evaluate and/or treat children with articulation/phonological disorders, language delays, autism, genetic syndromes, aphasia, dysarthria and apraxia. Services are also provided through the Scottish Rite Toddler program located at the Munroe Meyer Institute on the UNMC campus.

Teacher Education

The Early Childhood Endorsement is for teachers who wish to be highly qualified to teach children in settings with children from birth to primary ages.

UNO is the only institution in Nebraska offering the Bilingual Education endorsement for teachers.

Dr. Susan McWilliams coordinates the Family Literacy Project.

Literacy Support Services provides assessment, evaluation and instruction in reading and writing for children in local schools. Intense instruction and focus on the student's individual needs enables the teacher and student to see improvements in the student's reading achievement. A formal report is given to the parents at the end of the term.

UNO Child Care Center

UNO Staff at the UNO Child Care Center either currently sit on several early childhood boards and committees or they have in the recent past (one staff member currently serves as treasurer on the OAEYC Board. Another is part of the Early Childhood Consortium of the Omaha Area Board, the Child Care Health Consultants, Kids and Families Committee; she served on the OAEYC board for over 10 years, served on the Commission on the Status of Women for six years, and has worked with the Building Bright Futures Initiative).

The Child Care Center staff volunteer to help or facilitate at Trainings and Workshops held in the Omaha area, and they participate in the week of the Young Child Activities in the Omaha Area.

The Child Care Center is a host facility for the Early Childhood Training Center during Environmental Rating Scales Trainings.

They also work with the OPS Special Education Work Experience Programs, where students come and volunteer at the child care center to gain work experiences and learn a trade/job.

Students from Wayne State College, Dana State College and Peru State College do their student teaching and practicums/internships at UNO Child Care Center.

Psychology, Education, Health & PE, Music, etc. students come and do observations and course work at UNO Child Care Center for their classes.

Dr. Susan McWilliams from the Education Department sends students from her early childhood development classes to UNO Child Care Center.

Marcia Adler from Health Services is the UNO CCC Health Consultant and does trainings with the staff.

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GLOBAL ENGAGEMENT UNIVERSITY OF NEBRASKA OMAHA

SUMMARY

In a 2011 report, “Strength through Global Leadership and Engagement: U.S. Higher Education in the 21st Century” The Center for Internationalization and Global Engagement implores American colleges and universities to seize the opportunities of global engagement inherent in the realities of the twenty-first century. The report also recommends developing global strategies that align closely with the mission, history and values of the institution. For UNO, the drive for global engagement already responds to goals already established in UNO’s strategic plan. This report outlines three basic areas through which UNO can earn a distinguished position on the global stage.

INTRODUCTION

The University of Nebraska System has made global engagement a top priority, and has identified four goals that are to be focused upon by each of the four campuses:

- 1) Offer every undergraduate student the opportunity for a meaningful academic experience abroad;
- 2) Double international student enrollment;
- 3) Increase opportunities for faculty to work abroad and collaborate with colleagues and the world; and
- 4) Renew the commitment to work with countries and institutions throughout the world.

The University of Nebraska at Omaha (UNO) fully embraces these goals. At the same time, it recognizes that its unique metropolitan mission (unique within the system of campuses) carries opportunities and possibilities that lie outside the four goals. Therefore, in approaching global engagement, UNO seeks to exploit metropolitan advantages that result in additional opportunities and at the same time strengthens efforts to realize the four goals identified above.

This paper is organized into three additional sections. The first focuses on goals 1 and 2, students. The second addresses goals 3 and 4, faculty and partner nations and

institutions. The third section identifies a fifth goal; enhance meaningful partnerships with organizations and individuals in the metropolitan area and beyond whose interests lie beyond the borders of the United States.

The intent in writing this white paper is to advance the ongoing conversations about how to broaden global engagement on the UNO campus. The paper documents current activities, and focuses on goals and options for achieving these goals. There is some discussion of mechanisms for funding the activities described as well.

STUDENTS (GOALS 1 AND 2)

UNO STUDENTS ABROAD

Currently, about 300 students per year participate in some form of study abroad. The majority of these experiences is short-term – two weeks or less – and are led by faculty as a component of a regular class or departmental program. We encourage faculty from across the University to add course offerings that include a study-abroad component, as this may be more easily done than creating a semester-long study abroad experience for students in all programs/departments.

Although the trend in semester long experiences is increasing, fewer than 100 UNO students per year benefit from longer stays overseas. The majority of international travel is to European countries. Additional metrics, including comprehensive lists of courses with international travel and details of semester abroad activities should be gathered and made more available to the University community.

The number of students who participate in international programs is far too low for a university of UNO's size. It exposes a weakness in its educational system and a disservice to the state of Nebraska. One major benefit of a university education is to expose students to a global point-of-view best gained by an international experience. The University has failed to do so for a great majority of students. One reason that international experience has not been actively promoted is the loss of tuition income to the University for the semester or year that the student is abroad. This is short-term thinking that leads to graduates who are less aware of global issues and are increasingly isolated from the rest of the world.

In order to meet UNO goals and respond to NU system proposals for increased global engagement, it is desirable to increase the number of students who experience study abroad. Semester-long study is considered especially beneficial, as it may result in a deeper appreciation for another culture and learning of another language. Travel to a

larger number of countries, especially those outside Europe and linked to university research and service partnerships is encouraged.

To fund studies abroad, the University should create an International Experience Fund. The money for this Fund could come from a combination of (1) a student credit-hour fee, similar to those for technology, the library, and research (a \$3 fee would yield about \$1 million a year) and (2) the out-of-state tuition money generated by students from other countries who attend UNO (i.e. the difference between in-state and out-of-state tuition, or about \$6 million a year based on current enrollment.). The Fund would be applied to put long-term study abroad within the reach of every UNO student. Benefits of the Fund would include a passport for each undergraduate student who agrees to foreign study. A unique aspect of UNO's program could be the direct involvement, through funding and accompanying travelers, of individual sponsors, alumni and members of community organizations.

UNO students, perhaps to a greater degree than others in the NU system, lead busy lives that must balance employment, family obligations and education. For this reason, shorter term international experiences should be a strong option. Recent research shows that global perspective can be cultivated with on-campus activities designed to broaden understanding. A short term experience, along with appropriate on-campus support may be the most practical way to meet the objective at UNO. An initial short-term experience may also lead to students' developing an interest in additional and longer term study abroad. Research also indicates that there is a high return on investment for this experience. In a recent survey of employers, 73 percent indicated that a study abroad experience is important in evaluating job candidates for junior level positions.

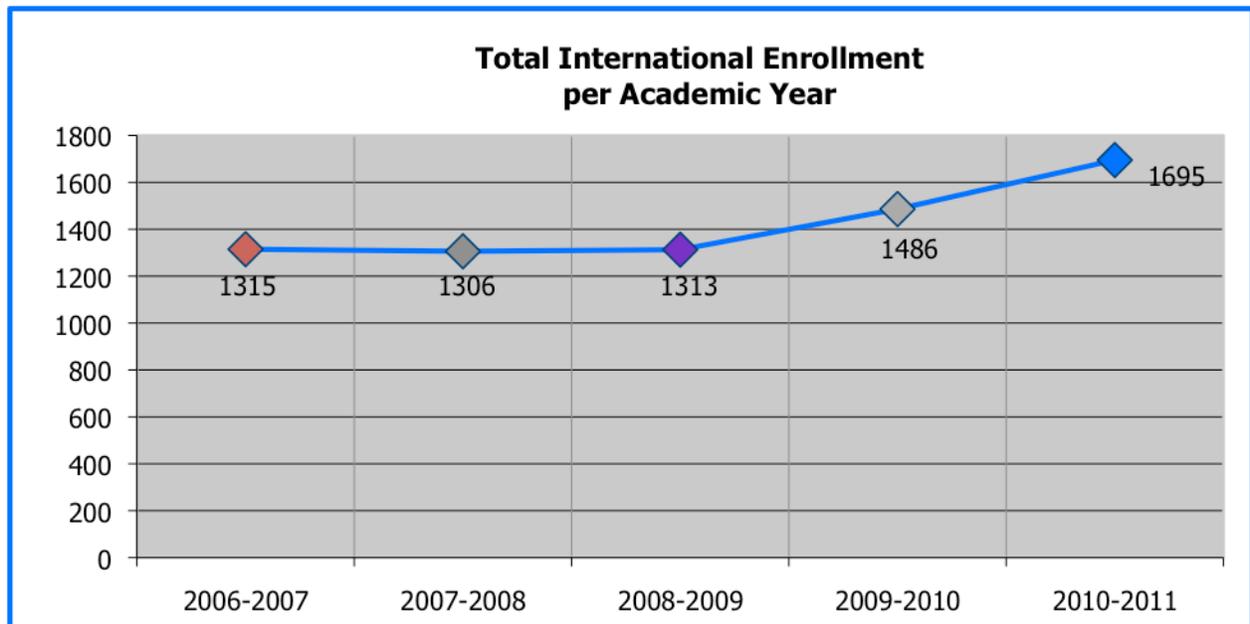
The University should strengthen language requirements. Language instruction should be coordinated with the languages of countries with university research and service partnerships. The most productive and promising relationships with sibling universities should be identified and emphasized. Special attention also should be given to critical languages supported by federal and international scholarship and grant programs.

INTERNATIONAL STUDENTS AT UNO

Exhibit 1 presents recent historical data on international student enrollment at UNO. In the 2010-2011 academic year, nearly 1, 700 students from 128 countries participated in some form of educational experience at UNO each year – far more than the number of

UNO students who studied abroad. About one-half of these are undergraduate students. The others were split evenly between graduate students and non-degree programs of various lengths. The ILUNO (Intensive Language at UNO) program was especially notable as an English learners “bridge program” leading to admission and an opportunity for students to register for UNO courses while simultaneously improving language skills.

Exhibit 1



International students represent a diversity of home countries, and more than half are from Asia and the Middle East. Scholarships and supporting programs from the students’ country of origin are responsible for several important cohorts, including students from Saudi Arabia, Oman and a new sponsorship program for Brazilians.

Very little funding is provided for the recruitment of international students, support for specialized admissions, visas, orientation, advising and other critical aspects of student success. The university system should provide funding for the marketing and promotion of UNO’s international offerings. Specifically, funding should be increased to promote and expand the proven ILUNO program. Additional resources should be directed to support student “on-boarding” and retention.

UNO should strive for as much diversity as possible in recruiting students from different parts of the world. Current sibling institutions should be revisited as venues for attracting students, and additional sibling partnerships should be considered. Existing research and service partnerships should continue to be viewed as

opportunities for recruitment, perhaps via coordinated travel that would include a UNO professor when circumstances allow.

Scholarship support, including judicious use of the UNO Advantage program, should be available selectively – to differentiate between students with substantial financial means, and those academically promising students with financial need. Funds should also be available to enable exchanges of students, or at least permitting UNO tuition to apply to the exchanging institution.

Finally, it should be stated that many international students who attend UNO come from families of means or countries with strong sponsorship programs. UNO's current rate of nearly \$16,000 a year for out-of-state tuition poses a barrier for students with less support. We can either continue a system that targets and exploits those best able to pay, or lower our out-of-state tuition. By lowering the out-of-state tuition, we would likely increase the number of students who could afford to attend UNO and may lessen the impact of reduced OOS tuition or, perhaps, even increase the overall amount of tuition generated.

When considering the appropriate tuition level for international students, not only the high cost of out-of-state tuition, but discounts and scholarships should be reviewed. These have been applied inconsistently and it is difficult for any single advisor or departmental representative to know what benefits can be offered in any particular circumstance. The availability of tuition support should be made more transparent and should be well defined as part of an across-the-board policy for tuition that is fair to all students.

Nebraskan and other domestic students can benefit greatly by virtue of meeting and interacting with students from around the world. UNO should apply all the resources necessary to enable this interaction and continue to value global engagement as integral to a superior educational experience.

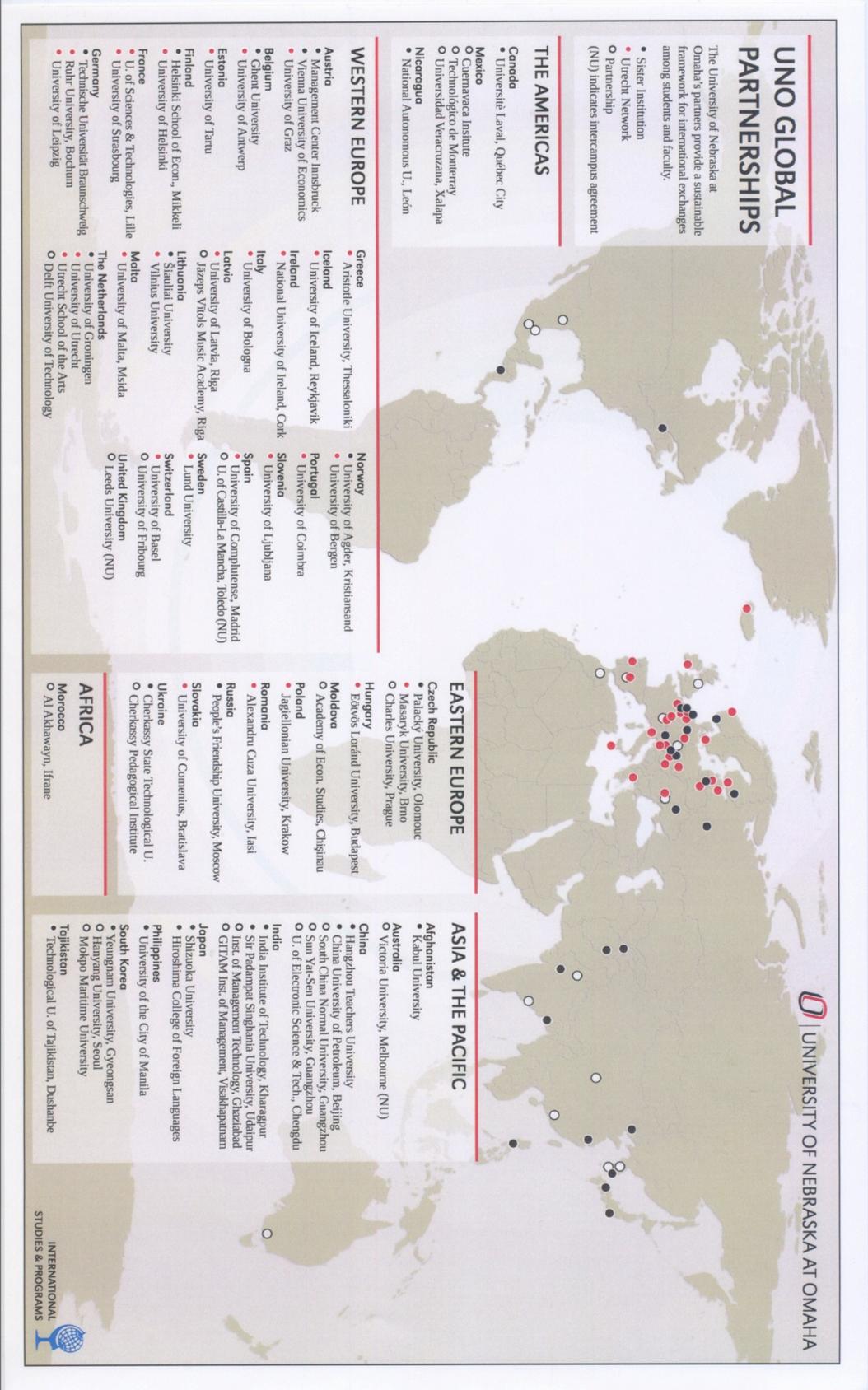
FACULTY AND PARTNER NATIONS AND INSTITUTIONS (Goals 3 and 4)

UNO has been globally engaged for five decades. Over the years a variety of partnerships and exchanges have developed. In some instances very strong sustainable relationships developed (e.g. Afghanistan), and faculty/student exchanges resulted, some involving home stays (e.g. Romania and Moldova). Some exchanges have been funded by U.S. government sources (e.g. Romania, USAID) and others by non-U.S. government sources (e.g., the government of Norway). In all instances, the benefit brought to UNO has been significant and institution partners have indicated that great benefit was brought in the other direction. Currently, UNO has partners around the globe. Exhibit 2 shows Sister Institutions, Utrecht Network and other Partnerships as points on a world map. As can be seen, the UNO reach is wide. In many instances, the relationships are deep.

A recent, but not all-inclusive, list of institutional partnerships is included below. Some detail is provided about the nature of the institutional relationships.

- IS&T has successful and very active bidirectional student mobility programs with University of Agder (UiA, Norway), Technical University of Braunschweig (TUBS, Germany), and Management Center-Innsbruck (MCI, Austria). Faculty at TUBS have been visiting professors at UNO, UNO professors have had academic assignments at TUBS.
- IS&T has developed strong Summer Immersion Programs where students from Indian partners (JUIT, IIT, SPSU), China (UESTC) and Norway (UiA) are participating in regular programs each summer in Omaha.
- IS&T students along with other students from campus have also participated in Immersion experiences in India and Norway.
- Students from Germany (TUBS, TUMainz, Universität Duisburg-Essen), Norway (UiA), India (JUIT/JIIT, IIT), China (UESTC) have spent summer and other semesters in Omaha working on faculty supervised internship, thesis or experiential projects.
- IS&T has recently added new partners in Korea (MMU) and Vietnam and have previously established, but not so active, agreements with other universities in Belgium (Ghent), Mexico (ITESM), Afghanistan (Kabul U), Russia (PFUR), and Netherlands (Delft U).
- With IS&T's most active partners in Norway, Germany, Austria and India, these are ongoing research and educational partnerships that have led to collaboration opportunities for our faculty/staff. Grant funding from both the private and government (federal, state and International agency) has substantively enhanced these collaborations.

Exhibit 2



Many of these institutional relationships involve faculty at some level. For example, in regards to UNO's relationship with TUBS, UNO and TUBS faculty have taught at the sister institution. UNO faculty have been teaching on a regular basis in Finland, and more recently at MCI. One UNO faculty member is the Director of Public Policy at Peking University, China's Harvard equivalent. Groups of faculty at UNO and other nations have spent significant time at each other's institutions collaborating on various programs (e.g., Ukraine, Romania, Delft U.) The major challenge in many of these relationships is in establishing more research collaboration. This is an area where UNO falls short of potential. New programs on the UNO campus that support global collaborative research will certainly help in this regard.

The above paragraphs summarize how we are currently or have been engaged with partner institutions. The following list summarizes what UNO should be doing in order to improve upon and expand these activities.

- Designate additional DE funds for the development of new online collaborative degree programs with sister campuses and other international partners.
- Design and launch a webpage that provides faculty with a "one stop shop" for information they would need to identify and organize opportunities for working abroad.
- Based on the UCAT model, launch a University Committee on the Advancement of Global Engagement. The committee could organize and sponsor a brown bag series where faculty who have been involved in international research/initiatives share their experience. The committee could also offer small grants for projects.
- Better communication/promotion of sister university relationships and study abroad programs--create a master list that is regularly updated and well publicized.
- Establish a set of International Engagement Links or Research Triangles devoted to a country or region where anyone on campus with an interest in that area can have a way to find one another and a setting in which to meet.
- Develop dual and joint degree programs with current and new partners. For example, MCI and TUBS have shown interest in dual degrees within IS&T and CBA.
- Expand distance learning to include global partners with articulation of tuition models. For example, IS&T is currently developing a proposal for an online undergraduate certificate in IT Administration with University of Agder.
- Develop joint certificate and executive programs with global partners. For example, IS&T is currently working on a model for an executive program with TUBS.
- Expand immersion programs to create short-term immersion experiences for faculty as a way to seed longer-term relationships for research collaboration.

- Explore new models for graduate education, particularly doctoral training. For example, a doctoral student could study the first year at UNO, followed by one year at the international partner school, and then complete the dissertation work from either location with a virtual committee.

GLOBAL ENGAGEMENT IN A METROPOLITAN SETTING (Goal 5)

UNO believes that it can strengthen its work toward achieving goals 1-4 and develop a different dimension of global engagement through collaborations with metropolitan organizations that have existing global partnerships or are seeking to extend their work beyond U.S. borders. In many cases, these organizations have been engaged in global work for multiple decades. In some instances, already existing collaborative relationships have led to progress in achieving goals 1-4. For example, for more than 20 years UNO students and faculty have worked with local and regional businesses in the exploration of business opportunities in various parts of the world. The long term benefits of these relationships include globalizing an academic program, exposing students to real business issues in other nations, and extending faculty experience at a global level. The partner organizations have received significant value and in many instances have approached the university again with an interest in funding additional projects.

In addition, it would be beneficial to UNO if new relationships were established under the aegis of conferences and events that already exist. Stronger organization participation, including company sponsorships, could bring international scholars, organization leaders and UNO personnel together to consider both academic interests and private/public sector concerns. Greater non-academic attendance at conferences could result, especially if keynote speakers and other presentations focused on issues that have broader appeal. UNO already organizes/has organized the following conferences:

- Global Studies Conference (annual)
- European Studies Conference (annual)
- Batchelder Biblical Archeology Conference (annual)
- Americas Conference on Information Systems (2005, could host again)
- IEEE International Conference on Data Mining (2007, could host again)
- International Conference on Computational Sciences (2012, could host again)

Overall, the conferences could be regarded as one element of a broad menu of activities and events offered by UNO with relevance to the growing metropolitan globally-oriented community.

Additional university/metropolitan organization partnerships together with subsequent programs and activities could strengthen relationships even more. The new partnerships would extend global engagement and worldwide knowledge within the Omaha metropolitan area. There are many organizations and citizens in the metropolitan area who simply wish to know more about global developments and events. While the conferences noted above can provide global exposure for a wide population base, in some instances they are too focused in specialized areas of interest to have broad appeal. Other program offerings could address the need for information:

- Provide systematic updates by region and/or country in regard to political, social and economic developments. Local and non-local experts would make presentations/lead discussions (progress already made in this regard).
- Have UNO faculty, staff and students perform as social, political and economic consultants to metropolitan organizations (progress already made in this regard).
- Bring in notable speakers two or three times a year to address an issue of great importance (e.g., the significance of the Arab Spring to U.S. political interests).
- Sponsor political discourse (e.g. debates) regarding U.S. foreign policy, including issues of international trade and immigration.

CONCLUSION

UNO should become the institution where almost all local and regional organizations go to for assistance when exploring a global opportunity or facing a global challenge. The University could help shape the global conversation for the Omaha MSA and the state (and beyond), providing both specific advice to organizations and helping to advance conversations that lead to public policy decisions.

Funding for these programs and activities can come from different sources. The student fees noted above might be used to partially fund speakers on the UNO campus. At the same time, businesses might be open to the idea of event sponsorship. Multiple year arrangements with a variety of organizations would allow for longer term planning, thus improving the quality of programs. Perhaps a return to the ABC breakfasts, once hosted by UNO, with an exclusive global focus would be of interest to regional businesses. In an effort to improve trade and other relationships, some countries wish to have their stores told in the United States. UNO might develop relationships with a broad range of countries where one-by-one ambassadors, other diplomats, and citizens of those countries would offer a program that would educate those in the metropolitan area about political, social and economic developments. On a much grander scale, and modeled in part on the program "Memphis in May," one nation might be the focus for a multiple-day event where the populace would become more familiar with a variety of

aspects about a particular country. Grant opportunities that might in part subsidize a conference, a speaker, or a program should be considered. Individual and foundation contributors who have placed a priority on global engagement for the University and the community should also be identified, and possible partnerships discussed.

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STEM AS A PRIORITY

UNIVERSITY OF NEBRASKA OMAHA

SUMMARY

UNO has recognized the importance of STEM, as being critical to its metropolitan university mission. Further, UNO must come together with area K12 school districts, community colleges, informal educational organizations and businesses to help make STEM concepts come alive, and to help students to see the relevance and excitement in what they learn.

INTRODUCTION

The current capacity of UNO for enhancing STEM efforts includes: existing faculty collaborations; a strong history of community engagement; a growing STEM interest on campus; new initiatives and interest in student research; and the natural integration at UNO of faculty responsibilities related to teaching, research, and service. Such existing capacity areas provide a strong foundation for future STEM action at UNO.

UNO is becoming a “metropolitan university of distinction” and in the context of that evolution, STEM is an opportunity for national recognition, innovation and leadership. UNO can build upon numerous past STEM successes to strengthen, develop, research and disseminate innovative STEM education models. In particular, the areas of opportunity at UNO in STEM include: developing innovative models for STEM recruitment and retention, building innovative P16 STEM collaborative efforts, expanding faculty support toward improving STEM teaching, connecting STEM to all disciplines, expanding partnerships with area businesses, expanding partnerships with informal education organizations, expanding collaboration with other campuses, and finally, becoming a national model for STEM literacy.

Continuing the momentum for STEM at UNO is central to the STEM-related successes of its metropolitan area and partners. In support of this continued momentum, the next steps could include: formalizing a campus STEM committee, assisting departments in STEM reviews, increasing recognition and support for innovative STEM activities, enhancing financial investments in STEM, and establishing a new UNO Center for STEM Learning.

UNO, through its position as a major Midwest metropolitan university, should not only contribute to national STEM solutions, but lead them. UNO’s close partnerships with the metropolitan community, faculty expertise and passion, and the ongoing recognition of both its strengths and challenges related to STEM positions UNO to become a catalyst to innovation at a local level, as well as a model for STEM reform at a national level. The time is now for UNO to assume its leadership in STEM and to Embrace the campus STEM priority with pioneering vision and aggressive action.

ISSUES

This paper describes the context, current capacity, areas of opportunities, and next steps for the STEM Priority (Science, Technology, Engineering, and Mathematics) at the University of Nebraska at Omaha. At UNO, as announced by Chancellor Christensen in his State of the University Address, STEM is a growing area of strength and potential at UNO, and has been designated as one of the five key campus priorities. This document is the result of efforts by the STEM Priority Committee as well as a meeting of community partners representing STEM-related interests in the Omaha area.

National reports, such as the 2010 *Rising Above the Gathering Storm Revisited*, paint an increasingly alarming picture for U.S. competitiveness in STEM areas as summarized across educational reports and statistics (National Academy of Sciences, 2010). U.S. competitiveness concerns relate to sample statistics such as: 51% of U.S. patents are now awarded to non-US companies (Donohue, 2010) and that the U.S. ranks 27th among developed nations in the proportion of college students receiving undergraduate degrees in STEM areas (Organization for Economic Cooperation and Development, 2009). The United States government is becoming increasingly concerned by these alarming national statistics to the point that President Obama, in his 2011 State of the Union Address, identified STEM education concerns as the nation's new "Sputnik moment." UNO has also recognized the importance of STEM, as critical to its metropolitan university mission, and that the university must come together with area K12 school districts, community colleges, informal educational organizations and businesses to help make STEM concepts come alive, and to help students see the relevance and excitement in what they learn.

The term "STEM" itself represents a nationally-endorsed strategy for collaboration within the context of organizational partnerships where science, technology, engineering and mathematics are instructed with focused interdisciplinary efforts among these important and discrete disciplines (National Research Council, 2010, Morrison, 2006). In fact, STEM is now being considered as a meta-discipline, where the integration of disciplinary knowledge forms into a new 'whole.' STEM offers students one of the best opportunities to make sense of the world holistically, rather than in bits and pieces and strives to remove the traditional instructional barriers erected between the four disciplines, by integrating them into one cohesive teaching and learning paradigm, where connections between school, community, work, and the global enterprise enable the development of STEM literacy and with it the ability to compete in the new economy (Gilmer, 2007; Tsupros, 2009; Hays, 2009).

This white paper assumes UNO must play a centralized role in STEM leadership and reform within its community. This centralized role is both consistent with UNO's metropolitan mission and strongly desired by its metropolitan partners. In the collaborative process, a community input session of 44 professionals was held discussing STEM needs, expectations, and potential strategies. A common theme developed at this meeting: UNO is central to the STEM success and educational reform in UNO's metropolitan community. UNO is seen as a critical source of expertise, innovation, and guidance for its community partners, whether they are K12 school districts, community colleges, businesses, nonprofit agencies, or the community at large. It is very clear to the university's partners that their STEM successes are linked closely to UNO's successes in preparing students for STEM careers, as well as the effectiveness of the university's various STEM-related initiatives.

UNO CURRENT CAPACITY

UNO's metropolitan university mission is well aligned with the strengthening of STEM efforts by growing partnerships within the community. In particular, the current capacity of UNO for such a priority effort includes:

- 1) **Faculty Collaboration:** Collaboration between faculty within the campus is a long standing strength, and many of UNO's externally funded grants to date in STEM Education have demonstrated this strength. There has been interdisciplinary external funding in areas such as bioinformatics, neuroscience, mathematics education, educational robotics, collaboration science, biomechanics, and environmental studies.
- 2) **Community Engagement:** UNO has undertaken innovative joint STEM projects with its community that has engaged local businesses, informal educational partners (such as the Zoo and museums), and other educational institutions, such as community colleges and local school districts. In addition, a strong UNO service learning academy continues to strengthen and help formalize the university's institutional capacity for joint partnerships with its community.
- 3) **A Growing STEM Focus:** Many UNO faculty and staff have already expressed a growing interest in STEM, as represented by the strong faculty attendance and participation in the "STEM Engagement Link" coordinated by the UNO Office of Research and Creative Activity, where more than 40 faculty and staff attended meetings to discuss STEM and to brainstorm additional opportunities for external STEM funding.

- 4) **Student Research:** UNO has recently decided to invest in supporting undergraduate research with the establishment of the FUSE Program (Fund for Undergraduate Scholarly Research). This program will fund undergraduates to conduct research both on and off campus, working with faculty mentors and the community. It is expected that this experience will aid in the recruitment, retention, and graduation of STEM majors, as identified in national studies (Gentile, 2011; Lopatto, 2009; Darnell 2008). Undergraduate research has also been shown to be particularly effective in attracting under-represented populations into STEM disciplines (Gregerman, 1999; Foertsch, 2000; Ishiyama, 2001, Nestor-Baker & Kerkor, 2009).

UNO AREAS OF OPPORTUNITY

In becoming a “metropolitan university of distinction” and in the context of that evolution, UNO’s STEM program is an opportunity for national recognition, innovation and leadership. The interdisciplinary nature of STEM, and the need for close partnerships both within an institution, and within its community, makes STEM a challenging endeavor for universities across the nation. UNO can build upon numerous past STEM successes to strengthen and to develop, research and disseminate innovative STEM education models. Maintaining a balanced focus between strengthening the core disciplines of STEM and interdisciplinary STEM branches and efforts will be important. In particular, areas of opportunity at UNO in STEM include:

1) Develop Innovative Models to Improve STEM Recruitment and Retention:

There is a well-recognized national trend related to losing STEM majors to other disciplines and UNO has also experienced this trend (Gentile, 2011; National Research Council, 2010). For example, on a national scale, approximately 50% leave the physical and biological sciences and 60% leave mathematics (Samueli, 2010; Seymour, 1997). The recognition and investigation of this at UNO allows the university to directly address this national trend at a local level, and to develop and test innovative models for supporting STEM student recruitment, retention, and graduation.

2) Build and Support Innovative P12 STEM Models: UNO has an excellent relationship with its P12 area school districts, such as supported by the Metropolitan Omaha Educational Consortium. This close relationship has already resulted in numerous STEM education grants to UNO and area schools, and represents an area of opportunity for UNO to be competitive for additional external funding that will expand upon innovative models of K16 STEM Education. Nearly 60% of local STEM teachers have degrees from UNO, and by working with these teachers and their districts, the university has an opportunity to undertake STEM reform that engages the whole educational system.

3) Expand Faculty Support and Leadership to Improve STEM Teaching: UNO should seek to assist both introductory and advanced STEM courses and for such

courses to become a launch pad to further student study in STEM and STEM-related careers. For example, in classes like applied linear algebra, students are taught with interactive video technologies and online homework support.

4) Connect STEM to all Disciplines: In many ways, success in STEM is a component for success across all disciplines and is an opportunity at UNO to enhance instructional innovation across the whole campus by connecting STEM disciplines to other disciplines. STEM represents an opportunity to build the scientific literacy of these disciplines, as well as to bring innovation and creative thinking into STEM and the STEM disciplines themselves. Such synergy between disciplines is an excellent area of opportunity at UNO, since there is already interdisciplinary interest in STEM across all colleges.

5) Expand Partnerships with Area Businesses: As supported by faculty across the various colleges, UNO has a strong relationship with area businesses, which is formalized through campus organizations such as the Nebraska Business Development Center, the Center for Economic Education, the Center for Collaboration Sciences, and the Center for Innovation, Entrepreneurship, and Franchising. Such formal business collaborations provide a conduit for increased partnership and innovation in STEM that can position UNO at the forefront of innovative STEM models that involve close collaboration with area businesses and their employees. Students who are successful in STEM programs at UNO will also be more successful in finding a job in area businesses. In addition, many STEM classes might also benefit from using business-related examples, datasets, or case studies.

6) Expand Partnerships with Informal Education: The context of STEM at UNO represents a wonderful opportunity for building partnerships with informal educational institutions across the metropolitan community. For example, UNO currently works closely with the Henry Doorly Zoo on numerous research and education-related projects. UNO is working on establishing a formal presence at the Strategic Air and Space Museum. Numerous new requests for proposals are now requiring a relationship between formal and informal educational institutions.

7) Expand Collaboration with Campuses: UNO already works closely with the other NU campuses and area community colleges. STEM articulation agreements with Metropolitan Community College, and shared STEM-related grants with Central Community College are in place. Within these partnerships, UNO has the opportunity to strengthen the pathways into its STEM coursework and programs, as well as be more competitive in external funding opportunities that require institutional collaborations, such as the recent UNO STEP proposal to the National Science Foundation.

8) Become a National Model for STEM Literacy: The United States is moving toward efforts to build STEM literacy for all citizens, and UNO can become a national model of supporting such literacy. STEM and STEM education has become an increased priority in the growing context of international competitiveness and in support of this model, it will be important to do global research on STEM strategies that are effective.

POSSIBLE ACTIVITIES/NEXT STEPS

UNO needs to continue the momentum for STEM at UNO. In support of this continued momentum, the next activities and related steps could include:

- 1) **Formalize a STEM Committee:** The campus needs to formalize a permanent and representative STEM committee that crosses colleges, and that provides both a conduit for STEM collaboration, shared discussions, and partnerships. This committee should support and strengthen strong ties to UNO's many current STEM community partners, and to further evolve new partnerships with K12 schools, other institutions, informal education, and businesses in STEM-related efforts.
- 2) **Assist Departments in STEM Reviews:** As UNO undertakes a STEM Priority, it will be important to assist interested departments across the campus in self-assessing their programs related to STEM strengths and challenges, to develop internal STEM action plans, and to implement specific initiatives to enhance their recruitment, retention, and graduation of STEM majors, as well as to be more competitive for external funding for STEM initiatives. This departmental support may well require the periodic engagement of an outside mentor or expert that has successfully undertaken similar STEM work at other universities.
- 3) **Develop new STEM modules, workshops, courses, programs, certificates and degrees.** Innovation in STEM for UNO's students and community needs to be continually operationalized within the context of new and enhanced STEM curriculum. Many innovations in this area are already being conceptualized on campus, such as the new program collaboration between the Mathematics Department and Department of Teacher Education to provide an option for teacher certification within a B.S. in Mathematics. Such collaborative strategies promise to directly enhance student choices and strengthen recruitment, retention, and graduation in STEM. Such curriculum components can benefit from direct partner involvement, in aspects such as their instructional design, use of datasets and real world examples, as well as in the use of more realistic field placements, internships, or student projects. STEM curriculum components, which depend heavily on strong faculty collaboration, are also great opportunities to refine new pedagogical strategies on the UNO campus such as online or blended learning, flexible course scheduling, or team teaching.

- 4) Increase Recognition and Support for Innovative STEM Activities:** UNO should recognize and support innovative STEM learning, research, and outreach initiatives by UNO faculty and institutional partners. That recognition can be through existing mechanisms, such as the daily campus e-notes, as well as in new mechanisms, yet to be developed. Such recognition provides a strong and ongoing communication opportunity for general calls to faculty to participate in new curriculum efforts, awareness building, research projects, and other STEM-related activities. Within STEM programs there is a need to develop strategies to mentor/train faculty in the many internship opportunities available to students, as well to connect faculty with internal and external experts in STEM and STEM-related fields to inform UNO program development. Such mentoring opportunities for STEM students will be vital to help with student retention.
- 5) Increase STEM External Funding Efforts.** There is a need to aggressively seek external funding for STEM research, pedagogy and partnership. STEM-related funding opportunities are growing rapidly, as the U.S. Government strives to address the nation's critical needs in STEM and various funding organizations such as the National Science Foundation increasingly include STEM in their calls for proposals. UNO already is in an excellent position to be competitive for such external funding opportunities and has have strong leadership and support from the Office of Research and Creative Activity (ORCA). Faculty should be encouraged to seek funding for STEM curriculum development, as well as STEM-related research on topics such as student recruitment, retention, and graduation strategies. In turn, ORCA will need to be provided with increased funds to assist faculty grant writing, for support activities such as hiring grant writers, external reviewers, and technical consultants to help to refine faculty grant proposals.
- 6) Enhance Internal Investments in STEM:** As a university, UNO will need to continually strive to enhance its "STEM Investment," as it relates to the financial aspects of such support. Example opportunities for internal funding support include travel to innovative STEM learning opportunities, research in STEM and STEM education, and faculty professional development workshops. Grant writing support in STEM will also become increasingly important as more faculty participate in external grant proposals. The STEM initiatives at UNO will also benefit from additional named professorships and community chairs designated for providing campus leadership in STEM. New positions such as the Haddix Chairs exemplify community engagement and represent an excellent opportunity to formalize and expand campus initiatives in STEM. To serve expanding populations some STEM investments will need to be made in physical infrastructure, such as laboratory space. Such support of the financial aspects of

STEM innovation may well be an important catalyst to increased STEM innovation.

- 7) **Establish a UNO Center for STEM Learning:** Steps should be taken to establish a university-wide leadership entity leading to a formal STEM Center at UNO. By formalizing STEM leadership within the context of a Center, UNO will establish a more stable funding and operational environment for supporting STEM innovation. A Center will also be symbolic to faculty, the community, and other institutions that UNO is striving for national distinction in this important area, and that this university is aggressively seeking to become a global model for STEM excellence. A STEM Center will also be an excellent conduit for increased STEM research, grant writing, and curriculum development within a context of increased interdisciplinary collaboration and enhanced connections to STEM partners and the community at large.

In order to help UNO to become a metropolitan university of distinction related to STEM, the following points are suggestions to jump start initiatives that will lead to achieving the proposed goals.

1. Develop and enhance STEM curriculum including:

- Support of individual faculty efforts for STEM and “pre-STEM” initiatives in a P-16 context
- Enhancement of funding to support the development of STEM-related modules, workshops, courses, programs, certificates and degrees
- Establishment of a FUSE/FIRE-like fund for STEM-related efforts
- Support of initiatives and work load flexibility for innovative models of teaching (i.e. team teaching, blended courses, etc.)

2. Support STEM research and assessment including:

- Support of investigations and interventions for student recruitment, retention, and graduation
- Establishment of scholarships and other financial support for students from underserved populations
- Enhancement of funding for graduate student assistantships with a STEM focus
- Providing opportunities to engage imported expertise (guest speakers, curriculum evaluators, statisticians, etc.)

3. Establish STEM leadership groups leading to a STEM Center including:

- Sustaining STEM as a key UNO priority with NU Foundation and expansion of efforts to receive chairs/professorships and other STEM initiatives through private support
- Support for active engagement of STEM faculty with faculty from traditionally non-STEM disciplines

CONCLUSION

STEM education should be a national priority as failure in such instruction constitutes a national crisis. UNO has both a responsibility and an opportunity to contribute solutions to improving STEM instruction. UNO's close partnerships with the metropolitan community, faculty expertise and passion, and the ongoing recognition of both its strengths and challenges positions the university to become a catalyst to STEM innovation at a local level, as well as a model for STEM reform at a national level. The time is now for UNO to assume leadership in STEM and to embrace the STEM priority with pioneering vision and aggressive action.

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SUSTAINABILITY UNIVERSITY OF NEBRASKA AT OMAHA

SUMMARY

The University of Nebraska at Omaha has developed substantial capacity in academics, operations and outreach relevant to sustainability without any central coordination, and has the opportunity to do much more. Progress in this area enhances the efficiency of our campus operations, better prepares our students to address the problems of tomorrow, and establishes UNO as a responsible and respected leader in academia and the community.

INTRODUCTION

Sustainability is most often defined in terms of meeting “...the needs of the present without compromising the ability of future generations to meet their own needs.”¹

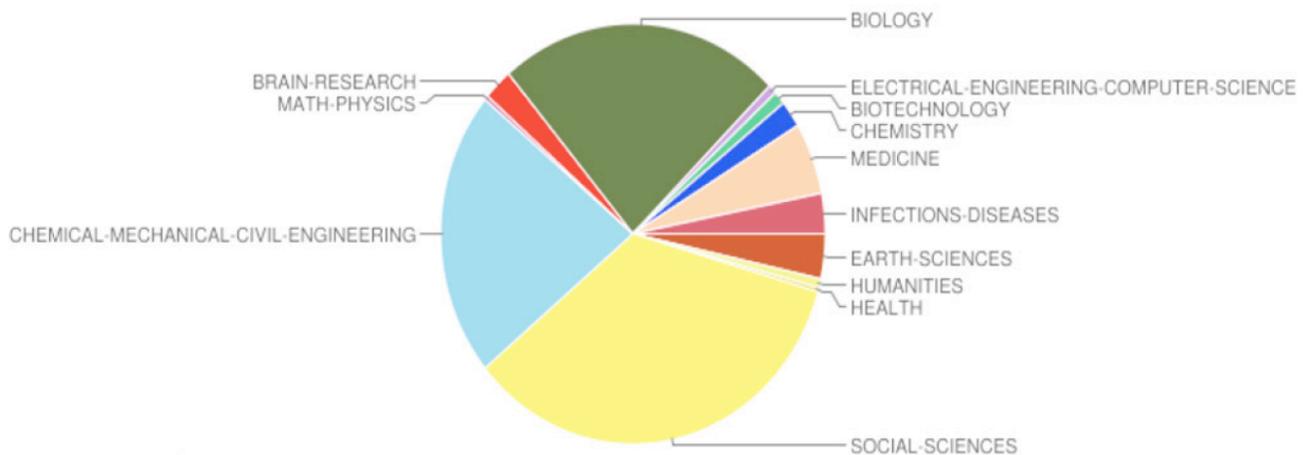
Sustainability provides a framework to organize knowledge about the use of resources and the implications of present decisions on the future. Due to increasing urbanization and their demanding stress on local environment, cities are often the proving ground where potentially sustainable practices are best tested and adopted. Sustainability must include the practice of assessment and adaption to condition changes. Action is necessary because otherwise, the financial and resource wealth and well-being of our community is undermined.

Sustainability calls for a multidisciplinary approach that goes beyond the academy to include business, government and the broad community. In the academy, it requires a bridge across many branches of relevant research (earth and life sciences and technology; social, behavioral and economic sciences; the humanities and the arts) to create useful knowledge and informed action to improve the quality of life. The sciences investigate and describe the impact of humans on earth’s resources and provide potential solutions. Institutions, economic systems and beliefs shape the cultural, organizational, and individual behaviors that move us toward or away from sustainability. Outside of the academy, achieving a more sustainable approach requires the effective management of organizations, wise decision-making, improving technology, and intelligent design of products and processes. In collaborating with external partners, UNO will provide leadership to help build social capacity to meet

¹ UN World Commission on Environment and Development (1987), *Our Common Future*.

current human needs in ways to leave our planet's support systems functioning and its natural resources available for future generations.

Sustainability integrates scholarship with practice, local and global perspectives, and expertise from all elements of the academy. As the economic and environmental need to establish sustainable system in which to exist and operate, sustainability has percolated up to the top of social academic imperatives. The figure below shows the distribution of research on the topic (Bettencourt and Kaur 2011). Over the past 25 years, the number of publications on sustainability is growing exponentially, doubling approximately every 8 years. Sustainability has a increasing presence in universities and laboratories of all sizes and the authors of publications are more often from institutions similar to UNO.



UNO'S CURRENT CAPACITY

Academics

UNO has capacity and depth in many of the disciplines that naturally support sustainability education, research and professional service. Courses that include sustainability exist and are increasing in number, and there are various sustainability research projects across the disciplines and colleges. Some examples include:

- An undergraduate major and a minor in Environmental Studies.
- A sustainability concentration in the Masters of Business Administration program.
- Many faculty are currently engaged in basic and funded research on sustainability, in departments normally associated with sustainability issues (such as biology and geology) and others not always associated with the issue (such as information technology, political science, psychology, business and public administration).
- UNL's Durham School of Architectural Engineering and Construction, based on UNO's campus, is a key player in the building design, construction and operations fields, and is well-connected to the Omaha business community.
- Research infrastructure exists for interdisciplinary research. The Library's Information Repository and the Center for Collaboration Science are two entities that promote joint efforts not only within the university but in the community.
- Funding sources such as the Fund for Investing in the Research Enterprise (FIRE) and the NASA Nebraska Space Grant and Experimental Program to Stimulate Competitive Research (EPSCoR) provide opportunities for certain research relevant to sustainability.

Operations

In its own operations, UNO is a major consumer of energy, food and water; and is a source of traffic congestion, air pollution, stormwater runoff, and solid waste in the Omaha area. Addressing these issues not only makes us better neighbors and stewards of our environment, but it also provides a test bed for applied research and service learning on the viability of innovative practices. Some recent progress includes:

- UNO was recently named as one of the top five contributors to the Low Carbon Information Technology Campaign in the Higher Education sector.
- The construction of Mammel Hall as one of the first Leadership in Energy and Environmental Design (LEED) certified academic building in the University of

Nebraska system. The operations of this building can be studied, as well as the human interactions inside the physical space.

- In the University Master Planning process, staff examined opportunities for applying renewable energy strategies to improve operations and found that large-scale geothermal systems will improve operations and provide a quick payback. This applied research will inform other universities and similar institutions.
- Information technology plays a critical role in enhancing sustainability in university operations. Computing devices consume a significant amount of energy besides generating heat and greenhouse gas emissions. Context-aware, resource management policies are used to automatically collect and analyze information about the user interactions with this infrastructure and aid in developing robust sustainability policies.

Outreach

- The GreenUNO Task Force raises the awareness of the campus community about environmental and sustainability issues, and coordinates and recognizes campus sustainability implementations.
- Staff members actively participate in the Green Omaha Coalition.
- The Nebraska Business Development Center helps business implement sustainable business practices.
- The Service Learning Academy provides students with service learning opportunities, and many departments have internships for students which are a means to link students to community organizations interested in sustainability.
- Housed on campus, Omaha by Design harnessed the efforts of five multi-disciplinary advisory committees (including several faculty and staff members) to craft Omaha's new environmental vision in the city's master plan.
- The Neighborhood Center of Greater Omaha is sponsored in part by UNO and provides a means for outreach to grass roots community organizations. The Community Engagement Center, expected to be built soon, will provide additional opportunities for campus-community partnerships.
- Information technology (IT) community involvement is crucial for successful sustainability initiatives. Computer game-based, virtual training environments are effective in providing an engaging and immersive experience to users. These environments are increasingly used across education, government, and industry to provide training to diverse sets of users. Computer game-based instructional modules across several disciplines using media-rich information technologies can widely disseminate IT sustainability policies.

OPPORTUNITIES

There are numerous opportunities at UNO to explore the concept of sustainability in the curriculum. Sustainability can be taught across the curriculum, rather than as an isolated topic. There are many possibilities for faculty to use class projects to enhance student understanding of sustainability not only in courses naturally suited for the topic, but also those not directly focused on sustainability. Internships, practica, and service learning opportunities for students will grow as the university focuses engagement on sustainability partnerships.

In the areas of research and service, UNO offers the potential for integration across different sectors and industries. Major corporations, governments and nonprofits in this metropolitan area are potential partners with whom we will do applied research relevant to sustainability. Omaha is the home of three of the largest architectural and engineering firms in the world, providing a rich source of potential partnerships. UNO and UNL's Durham School will be primary sources of the new workforce with the necessary skills to implement sustainable practices.

As Nebraska's metropolitan university, UNO's efforts may more naturally focus on urban sustainability issues such as: water supply, stormwater and wastewater management; resource conservation; solid waste disposal and collection; building construction and energy conservation; urban design and transportation; organizational change and human resource management; economic diversity and security, community health and behavioral change; and food safety and security. Faculty at UNO demonstrate multidisciplinary collaboration compared to the siloed approach of many American universities. This characteristic provides an opportunity for the cooperative research approach needed to advance the science and practice of sustainability. It also offers opportunities for curriculum development, teaching materials, textbooks, case studies and methods to engage students in local sustainability issues.

A proposal is currently under consideration to establish a Center for Urban Sustainability on campus which will engage all colleges. Its mission is to build and facilitate internal and external partnerships in order to strengthen interdisciplinary research, teaching and service that can make the University a leader in addressing the challenges of sustainability. Also under consideration is the creation of the Omaha Living Laboratory. This Laboratory would be a test site that would meter energy and water use for researchers to study building efficiency, opening new research opportunities.

CONCLUSION

A focus on sustainability is closely related to the other priority areas that UNO has identified (early childhood and child welfare, STEM [Science, Technology, Engineering and Math], doctoral programs and research, and global engagement). Social change which will endure must address early childhood education and quality of life issues. STEM education and research provides a basis for understanding systems models, and creates potential technological solutions. Research on sustainability can be enhanced by the growth of doctoral programs and the research they produce. By its nature, sustainability is a global issue of shared concern that can be a significant basis for global engagement.

UNO is the right place for a major initiative in sustainability because it has:

- Multidisciplinary academic programs built on a strong disciplinary foundations,
- Community relationships which provide a means to reach out to all residents,
- A metropolitan location that provides a living laboratory where many of the critical issues of sustainability reside,
- An ability to link academic endeavors with practical solutions, and
- The ability to serve as a steward of the future.

UNO is a leader that educates, collaborates and innovates. As a metropolitan university, we are in a position to affect these levels of human existence: by the way we manage the university through practices that contribute to sustainability, by research and service that improve the understanding of complex systems in nature and human activities leading to the discovery of both problems and obstacles to sustainability as well as solutions and innovations, by disseminating this information and fostering its implementation, and by educating a workforce that has the tools to carry out these tasks and an awareness of the issues among better informed citizens.

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