We proudly present the second iEXCEL Annual Report summarizing the progress and successes in implementing the iEXCEL vision. During the last year (July 2016 – June 2017), building the iEXCEL infrastructure and creating a culture that fosters innovation were strategic initiatives for this evolving program.

A major focus for the iEXCEL team was upon strengthening the clinical simulation services and launching the iEXCEL Visualization Hub. Talented staff were recruited and hired, and iEXCEL, in cooperation with the College of Medicine, assumed responsibility of the operations of the Sorrell Clinical Simulation Lab. High priority was also given to engaging students, faculty and staff in the design and functional layout of the Davis Global Center.

In April, a groundbreaking ceremony for the Davis Global Center was celebrated with more than 300 dignitaries, donors and well-wishers in attendance. The $102-million fundraising goal for the Davis Global Center was victoriously achieved with much gratitude extended to the University of Nebraska leadership, the University of Nebraska Foundation, and the dedicated philanthropists and advocates who believe in the iEXCEL vision and have committed resources to ensure it becomes a reality. As a result of extraordinary community effort, the Davis Global Center is well under construction with a projected substantial completion date of December 2018.

The next stage for iEXCEL includes concentrating on initiatives, such as enhancing workforce development opportunities through the establishment of an EON Reality VR Innovation Academy; extending statewide outreach by adding interactive, visual collaboration technologies at partner sites; and finalizing the interior design and technology selection for the Davis Global Center.

Mutually beneficial collaborations within the University and Nebraska Medicine, and with our external industry collaborators, will continue to flourish in the coming year, resulting in new research and development opportunities. Of special note was the national and global attention received during the course of the year and the excitement that is being generated by this unprecedented opportunity to lead in transforming health care education.

Sincerely,

Pam Boyers

Pamela Boyers, PhD
Associate Vice Chancellor,
Clinical Simulation, iEXCEL
In accordance with the iEXCEL strategic plan and additional operational oversight responsibility for the Sorrell Clinical Simulation Lab, the iEXCEL team expanded by nine full-time staff members. A "gateway" interactive graphic was created to help faculty and students easily identify access to the different and expanding offerings of iEXCEL.

### iEXCEL Program Development

Acceleration of the adoption of simulation is being fostered through regular engagement with the Education Council, the Interprofessional Academy of Educators as well as with students, faculty, staff, UNMC leadership and Nebraska Medicine.

#### iEXCEL Advisory Board

Convened by Chancellor Gold in November 2016 to provide essential guidance for the development of the iEXCEL program and the construction of the Davis Global Center, this board meets quarterly and is comprised of Omaha leaders representing business and philanthropic sectors.

#### BOARD MEMBERS

- **Mogens Bay**
  Chairman & Chief Executive Officer, Valmont Industries, Inc.
- **Jeffrey P. Gold, MD**
  Chancellor, University of Nebraska Medical Center & University of Nebraska at Omaha
- **Paul Hogan**
  Co-Founder & Chairman, Home Instead Senior Care
- **James Linder, MD**
  Chief Strategist, University of Nebraska
- **Susan Morris**
  President, Heritage Services
- **Walter Scott**
  Chairman Emeritus, Peter Kiewit Sons’, Inc.
- **Beverly Seay**
  Executive Director, Nebraska Applied Research Institute (NARI) at the University of Nebraska at Omaha
- **Michael Yanney**
  Chairman Emeritus, The Burlington Capital Group, LLC

#### SUPPORTING UNMC LEADERSHIP

- **Pamela Boyers, PhD**
  Associate Vice Chancellor, Clinical Simulation, iEXCEL
- **Suzanne Torroni-Roberts**
  Executive Director, Business Development, iEXCEL
- **Deb Thomas**
  Vice Chancellor for Business & Finance
- **Craig Ellis**
  Manager, Construction Services
- **Ben Stobbe**
  Executive Director, Clinical Simulation, iEXCEL
- **Ron Schaefer**
  Director, Planning & Construction
HIGHLIGHTS

• An iEXCEL Intern Showcase was held in the Visualization Hub in August 2016 and included demonstrations by the interns of their challenges and achievements working with new technologies for novel health care applications.

iEXCEL Interns 2016-2017:

Stephanie Purcell
University of Nebraska at Omaha

Taylor Kratochvil
Gonzaga University

Max DiBaise
University of Arizona

Drew Peterson
University of Nebraska at Omaha

Kyle Fisher
Metro Community College

Brendan Murray
University of Nebraska at Omaha

Collin Peterson
University of Nebraska at Omaha

• Faculty adoption and integration of simulation and visualization into the curriculum of all disciplines is a high priority. The UNMC Education Council held a faculty retreat in June 2017 to foster open dialogue and creative engagement with iEXCEL leadership and staff.

UNMC Education Council and iEXCEL
Philanthropy

In support of the design and construction of the Davis Global Center, $102 million in private and public funding was generously committed. This extraordinary philanthropic achievement was made possible by the work of the University of Nebraska Foundation and support from key community advocates. A naming gift from the Dorothy B. Davis Foundation of Omaha and other major donations to the University of Nebraska Foundation from individuals and organizations were celebrated at the Dr. Edwin Davis & Dorothy Balbach Davis Global Center for Advanced Interprofessional Learning official groundbreaking ceremony held in April 2017.

Benefactors of the Dr. Edwin Davis & Dorothy Balbach Davis Global Center for Advanced Interprofessional Learning

Dorothy B. Davis Foundation of Omaha
Clarkson Regional Health Services
Robert B. Daugherty Foundation of Omaha
Hawkins Sisters Foundation of Omaha
Home Instead Senior Care
Peter Kiewit Foundation of Omaha
Sally and Edward Malashock, MD, of Omaha
Ruth and Bill Scott Family Foundation of Omaha
Suzanne and Walter Scott Foundation of Omaha
Martha and David Slosburg of Omaha
Dorothy and Stanley M. Truhlsen, MD, of Omaha

PUBLIC SUPPORT
The City of Omaha
The State of Nebraska

The Davis Global Center was named in recognition of Dr. Edwin Davis, a longtime UNMC physician and educator who was a forerunner in incorporating new technology to enhance learning, and his wife Dorothy B. Davis.

Dr. Davis served as chairman of the urology department at the University of Nebraska College of Medicine from 1920 to 1953, and was innovative with his use of early technology to assist his lectures.

In 1921, Dr. Davis married Dorothy Balbach of Omaha, and they had three children, Edwin Jr., Neal and Willa. Both of their sons became physicians. A homemaker, mother and community volunteer, Dorothy also was the catalyst behind the family’s decision in 1957 to join Warren Buffett in the launch of his business venture. It was Dorothy’s tenacity and foresight that allowed the family to make this investment at UNMC.
iEXCEL Davis Global Center

**HIGHLIGHTS**

- **September 2016:** The Omaha City Council approved (by a 7-0 vote) UNMC’s request for funding from the City of Omaha to invest in infrastructure changes around the Davis Global Center. The Council cited benefits such as the economic impact for Omaha, including workforce development and increased visitors to the cutting-edge health care institution. An appreciation event was held with Mayor Jean Stothert and City Council members in February 2017.

- **October 2016:** UNMC and Nebraska Medicine received $19.8 million from the U.S. Department of Health and Human Services to develop a national training, simulation and quarantine center to train federal personnel on procedures in treating highly infectious diseases and to monitor persons who have received a high-risk exposure. The National Center for Health Security and Biopreparedness will be located on the lower level of the Davis Global Center and will leverage iEXCEL capabilities, technology and staff to provide exceptional training.

- **January 2017:** Ground was broken on the corner of 42nd and Emilie Streets to prepare for the construction of the Davis Global Center. A ceremonial celebration was held in April 2017 with Governor Pete Ricketts, Mayor Jean Stothert, Omaha philanthropic and community leaders, and an additional 300 supporters in attendance.

- **May 2017:** University of Nebraska President Hank Bounds authorized the commencement of construction for the Davis Global Center.

- A webcam is tracking the daily progress of the construction project. Visit the website: [https://app.truelook.com/?u=ug1485804873#1_live](https://app.truelook.com/?u=ug1485804873#1_live)

- The design for the Davis Global Center continued at a solid pace. Advanced technology and equipment evaluation began. The iEXCEL leadership team attended InfoComm, the largest annual conference and exhibition for AV and information communications, and began exploring the various technology options available.

**Design and technology selection for the Global Center progresses**

- 2015
  - April: University of Nebraska Board of Regents approve iEXCEL

- 2016
  - January: Construction for the Global Center begins
  - September: The Omaha City Council approved (by a 7-0 vote) UNMC’s request for funding from the City of Omaha to invest in infrastructure changes around the Davis Global Center.

- 2017
  - April: Celebration of the official groundbreaking ceremony
  - February: Estimated play for a fully operational Global Center

- 2018
  - December: Projected substantial completion of the Global Center

- 2019
  - April: Estimated play for a fully operational Global Center

- **LEFT:** Associate Vice Chancellor Dr. Boyers and Mayor Stothert
- **BELOW:** Davis Global Center groundbreaking ceremony
iEXCEL Statewide Network

Statewide outreach included working with global technology integrator, AVI-SPL, to produce a Statewide Network Report outlining the current landscape for iEXCEL connections, including challenges and potential solutions.

As plans progressed for partner sites to install a digital interactive wall (iWall), opportunities were provided for faculty and staff in Omaha, Scottsbluff and other UNMC campuses to experience a demonstration of the equipment and test the collaboration software, MT Canvus. The iWall and its software will shorten the distances between campuses and stimulate unique interactive and interprofessional educational experiences.

In July 2017, SIM-NE, a partnering simulation program at UNMC, was officially launched. This remarkable program uses four mobile simulation units to provide essential training to pre-hospital and hospital professionals throughout the state. The SIM-NE program was founded by UNMC and supported by a generous grant from The Leona M. and Harry B. Helmsley Charitable Trust.

At the invitation of the University of Nebraska-Lincoln’s College of Engineering, Pamela Boyers, PhD, associate vice chancellor for clinical simulation, and Suzanne Torroni, executive director for business development, served on a planning committee as co-chairs with Beverly Seay, executive director of NARI at the University of Nebraska at Omaha (UNO), to create a new track at the 16th Annual Institute of Electrical and Electronics Engineers (IEEE) International Conference on Electro Information Technology held in Lincoln, Neb. The new track, “Advances in Modeling and Simulation in the Health Sciences: Opportunities for Collaboration,” included keynote and panel discussions featuring local, national and international experts.

Keynote Sessions supported by iEXCEL

<table>
<thead>
<tr>
<th>Keynote Speaker</th>
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<tr>
<td>Jeffrey P. Gold, MD, UNMC</td>
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<td>Robert Amyot, MD, CAE Healthcare</td>
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<td>Ronnie Green, PhD, UNL</td>
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<td>Robert Amyot, MD, CAF Healthcare</td>
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<td>Matthew Rizzo, MD, UNMC</td>
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<tr>
<td>Mats Johansson, EON Realty</td>
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Panel Discussion: Can M&S Improve Human Performance?

Presenter: Sylvan Brum, Arizona
Moderator: Beverly Seay, UNL (NARI)
Panelists: Joseph Sir, PhD, UNMC; Paul Paulman, MD, UNMC; Mily Caranhar, Home Instead Senior Care; and Angela Panzar, PhD, UNL

Panel Discussion: Opportunities for Collaboration between Engineering and Medicine in M&S

Presenter: Dmitry Deynukov, MD, UNMC
Moderator: Nathan Meier, UNL
Panelists: Brian Kran, PhD, UNO; Jeffrey Berkley, PhD, Mimic Technologies; Paul Fraiz, Jump Simulation; and Khalid Sayood, PhD, UNL

Panel Discussion: Global Trends in Simulation & Visualization and Advanced Applications

Presenter: Walter Greenleaf, PhD, Stanford University; Jim Angelillo and David Thorson, AVI-SPL
Moderator: Pamela Boyers, PhD, UNMC

In July 2017, SIM-NE, a partnering simulation program at UNMC, was officially launched. This remarkable program uses four mobile simulation units to provide essential training to pre-hospital and hospital professionals throughout the state. The SIM-NE program was founded by UNMC and supported by a generous grant from The Leona M. and Harry B. Helmsley Charitable Trust.
iEXCEL Visualization

With a newly formed visualization team and completed renovations in the iEXCEL Visualization Hub (VizHub) located in the Michael F. Sorrell Center for Health Science Education, iEXCEL focused on building an effective infrastructure in order to create high-quality medical visualization content in a variety of formats – from augmented and virtual reality (AR/VR) to holographic.

Several software demonstrations throughout the year allowed students, faculty and staff to play an integral role in the technology selection for iEXCEL and its future home, the Davis Global Center.

Examples of early medical content developed by the iEXCEL Visualization Team included:

- Visualizing tumors via video
- Ear and eye models to demonstrate movement and function
- Interactive syringe use and order filling for pharmacy students
- Surgical planning – for example, eye surgery video of modified strabismus procedure
- 3D printed eye model for patient education
- Crash cart/anatomy demonstration using the HoloLens (AR/VR)
- 3D printed skull model for planning approaches to tumors
- Creating a holographic Dr. Gold to appear before the University of Nebraska Board of Regents in Kearney

The iEXCEL Visualization Team built cross-disciplinary rapport and worked on creating formal processes and procedures for content development. They also participated in specialized software trainings. Requests for content development by faculty and subject matter experts exceeded the talented team’s capacity in fiscal year 2016-2017. Thus, in cooperation with the Educational Council, a Visualization Project Prioritization Work Group comprised of interprofessional faculty members was proposed to solidify procedures and provide a rigorous yet fair project selection process.

EXPO HIGHLIGHTS

The second annual iEXCEL Expo was held in October 2016 in the iEXCEL Visualization Hub. Attendees were able to experience the newest visualization technologies and try out the latest simulation products. Industry collaborators provided demonstrations and discussed applications within health care education and training. Feedback about the relevance and utility of the products was elicited through surveys.

Featured technologies, exhibits and industry representatives:

- VizHub Technology: 3D CADWall, iMail, iBench, iMirror and HoloLens
- CAE Healthcare: Lucina, VIMEDIX
- Gaumard: Surgical Chloe, Pedi Hal
- Laerdal: SimMan 3G
- KGS: Trauma FX
- EON Reality: Thyroid Biopsy Simulator
- The Chamberlain Group: realistic heart model
- RDG Planning & Design and The Clark Enersen Partners: 3D renderings of the Global Center presented via a head-mounted display
- AVI-SPL: provided support and answered questions regarding technology and technology integration
- Karl Storz Endoscopy: provided support and presented information regarding the latest in its product line

Dr. Gold presented as a hologram to the Board of Regents
In early 2017, iEXCEL assumed operational oversight for the UNMC Sorrell Clinical Simulation Lab in anticipation of joint operations with the Davis Global Center. Several new staff members were hired and the current Sorrell Lab staff transitioned into expanded roles.

### Advanced Simulation Staff

- **Ray Layne**
  Manager, Advanced Simulation Operations
- **Amber Mekush-Harter**
  Program Associate
- **Jered Kotschwar**
  Advanced Simulation Program Coordinator
- **Samantha Rogers**
  Advanced Simulation Specialist II
- **Jonathan Sample**
  Manager, Advanced Simulation Operations
- **Patricia Carstens**
  Manager, Simulation Curriculum Development, Assessment and Research
- **Stephanie Purcell**
  Intern
- **Taylor Kratochvil**
  Intern

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<td>2</td>
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<tr>
<td>Clarkson College</td>
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<tr>
<td><strong>Total</strong></td>
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### Business Development

In preparation for iEXCEL business development growth, opportunities to engage with industry leaders in simulation and visualization technologies were expanded.

**iEXCEL industry collaborators continued to support by:**

- Attending the iEXCEL Expo, Industry Roundtable and the Davis Global Center groundbreaking ceremony
- Participating as keynote speakers and panelists for iEXCEL — organized events included the IEEE Conference at UNL and the Davis Global Center groundbreaking ceremony
- Providing industry expertise and experience to add value to the business mission of iEXCEL
- Partnering on joint endeavors such as the EON Reality VR Innovation Academy, which will be an industry training certification program provided by EON Reality and housed at UNMC—this will support iEXCEL’s project pipeline and help to grow and diversify Omaha’s workforce

Building on momentum created by the Expo, iEXCEL invited select industry representatives as well as the Omaha Chamber of Commerce to participate in the first-ever iEXCEL Industry Roundtable. The theme was "The Application of Visualization & Simulation into Health Care." The panel of global industry leaders presented and stimulated discussion on topics such as:

- Applying lessons learned from high-risk industries (such as aviation) to address quality and safety in health care
- The incredible market potential for health care-related simulation and augmented/virtual reality

**Opportunities for open discussion with additional select industry collaborators were structured through signed agreements:**

- **Mutual Non-Disclosure Agreements (NDAs):**
  - The Chamberlain Group – June 2016
  - AV Exp. Limited – June 2016
  - MultiTaction – December 2016
  - Home Instead Senior Care – February 2017
  - Nasco – February 2017
  - PhD Student Thesis (Johns Hopkins University) – February 2017
  - Aptima – April 2017
  - Gritulate – June 2017

- **Memorandums of Understanding (MOUs) and Teaming Agreements:**
  - Home Instead Senior Care – April 2017
  - IVIR, Inc. – June 2017

- Introductions of UNMC and Nebraska Medicine innovators, along with UNeMed, to key industry collaborators resulted in two signed mutual NDAs with EON Reality and CAE Healthcare to explore opportunities and potential business relations regarding ‘Pupil Sim.’

**Grants submitted by iEXCEL in FY 16/17 include:**

- Aptima BAA – May 2017
- Medical Technology Enterprise Consortium (MTEC) – June 2017
- Small Business Technology Transfer Program (STTR) – June 2017
**iEXCEL Military Relations**

**HIGHLIGHTS**

**July 2016**

An Education Partnership Agreement (EPA) with Wright Patterson Air Force Base (WPAFB) Air Force Research Laboratory (AFRL) was signed. This EPA supports collaboration between WPAFB and UNMC. Students and faculty will be able to benefit from the United States Air Force’s expertise and engage in new research and development opportunities.

**March 2017**

In partnership with NSRI, Ben Stobbe, executive director for clinical simulation, and Ray Layne, manager, advanced simulation operations, supported a Joint Special Operations Command (JSOC) training course in Utah. The focus was on the care of an individual who had either a chemical, biological, radiological or nuclear (CBRN) exposure. By using high-fidelity human patient simulators, the trainees were able to experience a realistic scenario and provide hands-on care for an individual (simulated) presenting different airway conditions due to exposure.

**May 2017**

Angel Thunder 17 (AT17) – a Live Virtual Constructive Exercise (LVCE) for US troops and nine international partner nations - involved 650 participants and focused on personnel recovery. Ben Stobbe and Ray Layne supported this exercise under the formal EPA with WPAFB. Military-specific medical care scenarios were created including extrication, mass casualty, transfer-of-care and extended medical care during flight transport. The use of human patient simulators provided training of realistic medical care scenarios, triage challenges and life-saving procedures. The overall goal was to prepare teams to effectively manage medical communication and leadership skills required under high stress situations.

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**iEXCEL Outreach**

A number of outreach efforts demonstrated a commitment to articulating the iEXCEL vision and engaging with valued local, national and global stakeholders.

**Sixteen presentations given**

Including Big Ten dental deans; Douglas County Health Department and Board of Commissioners; University of Nebraska Board of Regents; and the Online Learning Consortium.

**Nine educational conferences**

- The Interservice/Industry Training, Simulation and Education Conference (I/ITSEC)
- Florida Simulation Summit (FSS)
- Special Operations Command (SOCOM)
- Institute of Electrical and Electronics Engineers (IEEE)
- Society for Simulation in Healthcare (SSIH)
- Association of Standardized Patient Educators (ASPE)
- Accreditation Council for Graduate Medical Education (ACGME)
- Online Learning Consortium (OLC)
- InfoComm

**iEXCEL’s e-newsletter, Digital Pulse, published five issues to more than 900 contacts**

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**iEXCEL Twitter account**

- 68 Tweets
- 57,128 Impressions
- 1,055 Profile visits
- 82 Posts by others mentioned iEXCEL
- 156 New followers
- Top tweet: Annual iEXCEL Expo

**Tours/Visitors**

Total in FY 16-17 = 153 tours

- 43 Educational/Content Creation Activities
- 31 Military and Government Delegations
- 4 Faculty Development Sessions
- 9 International Delegations
- 15 Recruitment Events

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**Visitors as of June 30, 2017**

2,815 Visitors
The technology that will be available at their university is doing to prepare the next generation of health care professionals and serve our state. All lives saved. Congratulations at iEXCEL is certainly impressive, but what I’m most excited about is what this technology means for the people of Nebraska – better care, better outcomes and lives saved. Congratulations to all the partners who have made this initiative possible.”

– Hank Bounds, PhD, president, University of Nebraska

iEXCEL Outreach continued

Notable Visits to the iEXCEL Visualization Hub

• Government Officials and Candidates: Governor Pete Ricketts; Legislative Candidates Larry Scheuer, Dan Quick, Jill Brown, Anna Wishart; Attorney General Doug Peterson; Secretary of State John Gale; Senators Sue Crawford, Jim Smith, Jim Scheer, Matt Williams, Dan Hughes, Curt Friesen, Burke Harr along with their respective spouses

• Military Organizations: Joint Special Operations Command (JSOC), Veterans Affairs (VA), Offutt Air Force Base, Air Mobility Command, United States Strategic Command (USSTRATCOM), United States Air Force Surgeon General’s Office and Assistant Secretary for Preparedness and Response (ASPR)

• International Visitors from Tanzania, China, Qatar, Norway, South Korea, Taiwan and Russia

• Industry: OPPD, Werner Enterprises, Blue Cross Blue Shield, Kiewit Corporation and Home Instead Senior Care

• Community: Various community colleges, county health system leaders, Boys and Girls Club of the Midlands, Douglas County Health Department, Do Space, Henry Doorly Zoo and Nebraska Business Development Center

• Various Philanthropic Visitors

• Recruitment/Career Development: Careerockit, Nebraska Area Health Education Centers (AHEC) and Health Professions Day

Media Coverage

iEXCEL was featured in more than 70 articles/videos over the year

The Davis Global Center groundbreaking ceremony recorded 45 media placements

A SAMPLING OF THE TOP HEADLINES INCLUDED:

August 12, 2016 “UNMC Hopes it can Answer Federal Call for Ebola and Infectious Disease Training Center” Omaha World-Herald

August 30, 2016 “A Huge Opportunity: Council Oks Plan to Pay $10.7 Million toward UNMC Training Facility” Omaha World-Herald

August 30, 2016 Video: “Virtual Reality Medical Training in Works at UNMC” KMTV

November 4, 2016 “UNMC Facility will give Campus New Role in Biosecurity, Act as ‘Epicenter’ of Preparation for Ebola and other Diseases” Omaha World-Herald.

April 3, 2017 “UNMC Breaks Ground on Global Center for Advanced Interprofessional Learning” Nebraska News Network

April 4, 2017 Video: “UNMC Heads into World of Virtual Reality” KMTV

April 4, 2017 “Nebraska Health Students to Receive High-Tech Learning” US News and World Report

May 12, 2017 “UNMC Moves Toward New Technology to Close Distance Gap, Enhance Education” Fox 42 News

Publications


Defence Global Case Studies: “iEXCEL at the University of Nebraska Medical Center (UNMC)” November 2016; “The New National Center for Health Security and Biopreparedness at the Davis Global Center, The University of Nebraska Medical Center (UNMC)” May 2017