

ABSTRACT: 2016 ELAM Institutional Action Project Poster Symposium

Project Title: Excellence in Medicine and Engineering: A New Paradigm in Medical Education

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Background, Challenge or Opportunity:

Medical education at the University of Illinois is changing. In March 2015, the University of Illinois Board of Trustees unanimously approved a proposal from the Urbana campus to establish a new independent Carle Illinois College of Medicine with a novel engineering-focused curriculum. In May 2015, it was announced that the current University of Illinois College of Medicine site in Urbana (one of four regional campuses of the College of Medicine) would phase out as the campus prepares to open the new College. These significant developments create exciting opportunities for all involved: the Champaign-Urbana community, Carle Health System, College of Medicine, University of Illinois at Urbana-Champaign, University of Illinois, State of Illinois, the nation and the world. The vision of the new College, as described by the former Chancellor of the University of Illinois at Urbana-Champaign, Phyllis M. Wise, PhD, is to establish the first research-intensive College of Medicine to focus expressly on the convergence of engineering, technology, innovation and big data, and health care.

Purpose/Objectives: My project focuses on preparing for the new Carle Illinois College of Medicine, including developing the educational underpinnings and framework for the new curriculum with a focus on novel, innovative, engineering-focused medical education.

Methods/Approach: Curricula from medical-engineering initiatives (including bioengineering, computer science, technology, 'big data,' and health systems engineering programs), innovative medical curricular reforms, accreditation requirements of the Liaison Committee on Medical Education (LCME), and new educational initiatives from the Association of American Medical Colleges (AAMC) are under review; discussions with national thought-leaders and experts continue. Numerous meetings and discussions are ongoing with multiple stakeholders, including faculty and campus leaders at the Urbana and Chicago campuses, physician and administrative leaders at Carle, community leaders, and others. Collaborative work with biomedical, engineering, and clinical faculty is ongoing within a recently established Curriculum Committee.

Outcomes and Evaluation Strategy: Faculty from multiple areas of expertise, including biomedical sciences, engineering, and clinical medicine, are studying and reviewing all aspects of the anticipated curriculum. Core values, established at the outset, provide guidance. Curricular efforts will emphasize analytical thinking, problem-solving, data-mining, and clinical training. Questions under consideration include: what should be the required prerequisites for entering students, and why? What is the optimal approach to incorporate engineering into the medical curriculum? How does a focus on engineering impact learning in the clinical environment? How does experience in the clinical environment influence engineering thought? How do we best produce physician discoverers and physician innovators? What careers do we envision for graduating students? Potential outcomes and evaluation of the new curriculum will be driven by input from stakeholders, and include metrics such as LCME accreditation, student performance on U.S. Medical Licensing Exams (USMLE), residency matches for graduating students, opportunities for students after graduation, and ultimately, student career paths and achievements.

Excellence in Medicine & Engineering: A New Paradigm for Medical Education

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Background

There is a revolution in Medical Education at the University of Illinois:

- March 2015: University of Illinois Board of Trustees (BOT) approved a proposal to establish a new independent Carle Illinois College of Medicine with a novel engineering-focused curriculum.
- May 2015: BOT announced that the current University of Illinois College of Medicine site in Urbana (one of four regional campuses of the College of Medicine) would phase out as the campus opens the new College.
- Exciting opportunities: State of Illinois, the Nation and the World.
- Vision: **to establish the first research-intensive College of Medicine to focus expressly on the convergence of engineering, technology, innovation and big data, and health care.**
-- Phyllis M. Wise, PhD, former Chancellor, University of Illinois at Urbana-Champaign

Purpose

- To prepare for the new Carle Illinois College of Medicine, and,
- To develop the educational underpinnings and framework for the new curriculum

Methods

- Curriculum: will emphasize analytical thinking, problem-solving, data-mining, clinical training
- Under review:
 - Curricula from medical-engineering initiatives (including bioengineering, computer science, technology, 'big data,' and health systems engineering programs)
 - Innovative medical curricular reforms
 - LCME accreditation requirements
 - New educational initiatives from AAMC
- Discussions: with national thought-leaders and experts
- Stakeholder meetings & discussions: with faculty and campus leaders at the Urbana and Chicago campuses, physician and administrative leaders at Carle, community leaders, and others
- Collaborative cross-disciplinary work: with biomedical, engineering and clinical faculty, within a recently established Curriculum Committee.

Outcome

Efforts are underway to launch the new Carle Illinois College of Medicine in Urbana.

Next Steps

- Dean search is underway
- Approval sought from Illinois Higher Learning Commission for educational programs
- LCME accreditation
- Fundraising
- Exploring multiple curricular issues, which include:
 - What should be the required prerequisites for entering students, and why?
 - What is the optimal approach to incorporate engineering into the medical curriculum?
 - What aspects of engineering are most important for medical students?
 - How does a focus on engineering impact learning in the clinical environment?
 - How does experience in the clinical environment influence engineering thought?
 - How do we best produce physician discoverers, physician innovators and physician leaders?
 - What career trajectories do we envision for graduating students?

Evaluation Strategy / Discussion

Such a venture represents additive value to medical education in the state of Illinois, nationally, and globally.

Given that the experience is designed to be novel, and technology and data driven, it is expected that a specific type of student would be attracted to such training.

A novel curriculum requires a great deal of creativity and input from a deliberately diverse group of stakeholders: medicine, biomedical sciences, engineering (including bioengineering, computer science, health systems engineering, big data), social sciences.

The University of Illinois at Urbana-Champaign, a nationally recognized land grant institution and the flagship campus with a top 5 College of Engineering, and Carle, a leading healthcare system in Illinois, provide a fertile environment for a new paradigm for medical education.

Ongoing fundraising is integral to the College's success.

Potential outcomes and evaluation of the new curriculum will be driven by input from stakeholders, and include metrics such as:

- LCME accreditation
- Student performance on U.S. Medical Licensing Exams (USMLE)
- Residency matches for graduating students
- Opportunities for students after graduation, and
- Student & faculty careers and achievements, amongst others.

Conclusions

The nation's first proposed engineering focused medical school represents a new paradigm in medical education: "the medical school of the future."

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