Maybe the Real Treasure is the Friends We Made Along the Way (Or – *My Decade in Ed Div*)

Daniel D. Burkey
Associate Dean: Undergraduate Education & Diversity
Professor-in-Residence: Chemical & Biomolecular Engineering
University Teaching Fellow

370b - In Honor of the 2020 Education Division Award Winner for Innovation in Chemical Engineering Education
Tuesday, November 9, 2021

UCONN
SCHOOL OF ENGINEERING

In the beginning…

2003-2008(ish)

June 2003, with my advisor, Karen K. Gleason

Dr. Al Sacco, Jr.

Dean and Professor,
Texas Tech University

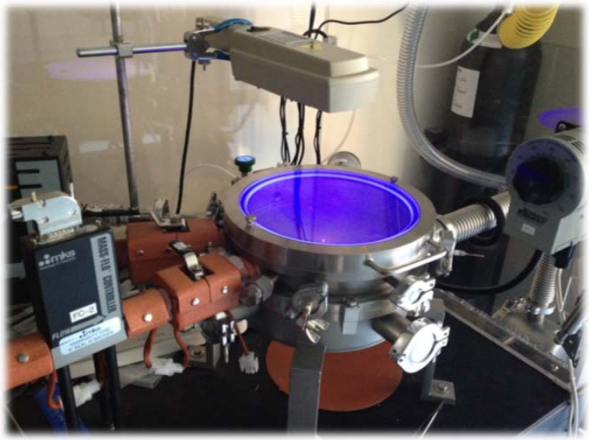
Dr. Kate Ziemer

Senior Vice Provost for Academic Affairs
University of New Hampshire

Ph.D. 2003

Tenure-Track Assistant Professor
Northeastern University

~5 years



Chemical Vapor Deposition of Polymeric Thin Films…

Dr. Courtney Pfluger (Ph.D., 2011)

Associate Teaching Professor,
Northeastern University

2021 Winner of the *Innovation in Chemical Engineering Education* Award

What I learned from Courtney…

Ph.D. 2003

Tenure-Track Assistant Professor
Northeastern University

~5 years

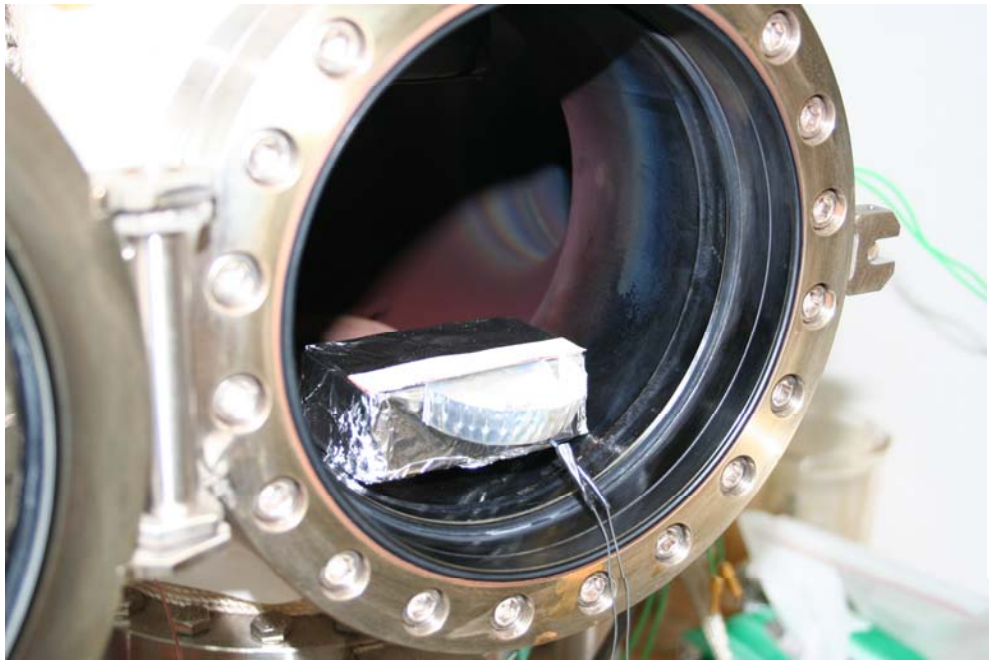
????

FAILURE

- Research and grant writing in my previous discipline didn't *feel* right…
- Educational scholarship was more exciting to me – but that wasn't really recognized "as a thing" at the time…
- This is 2008…a full year before EdDiv was even chartered!

Not all who wander are lost…(?)

2008-2010(ish)



A CVD Reactor at GVD Corporation

Ph.D. 2003

Tenure-Track Assistant Professor
Northeastern University

~5 years

????

FAILURE?

Ph.D. 2003

Tenure-Track Assistant Professor
Northeastern University

~5 years

Senior R&D Engineer
GVD Corporation

~2 years

- Working at a small company was *different*…
- The technical work was very challenging – I got to design cool things and work on hard problems…
- But this experience really cemented in me that I wanted to be an educator – I missed students!

Starting over…

2010-2012(ish)

Ph.D. 2003

Tenure-Track Assistant Professor
Large, Private, Urban University

~5 years

2008

Senior R&D Engineer
GVD Corporation

~2 years

~2 years

2010

Non Tenure-Track
Assistant Professor
University of Connecticut

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Senior R&D Engineer
GVD Corporation

~2 years

2010

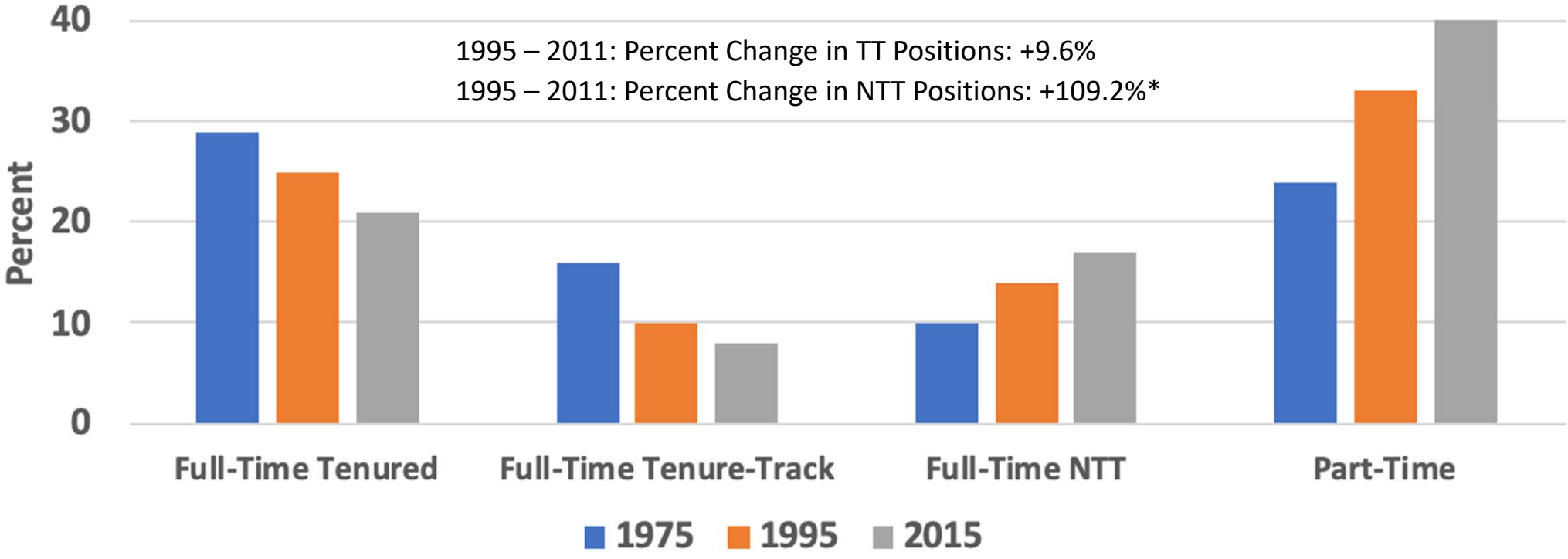
~2 years

Non Tenure-Track
Assistant Professor
University of Connecticut

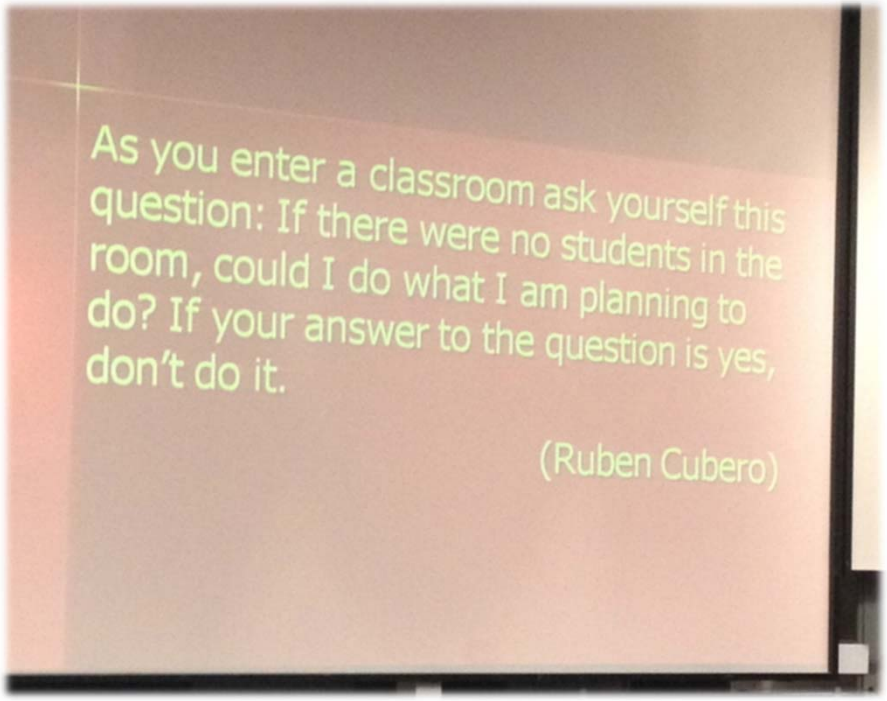
- 2010 – First time back at AIChE since Philly 2008
- Ed Div now exists formally! (Chartered 2009)
- I start attending Ed Div Sessions

Trends in the Academic Labor Force: 1975-2015

*Source: AAUP Research Office - March 2017



*Government Accounting Office (GAO), "Contingent Workforce: Size, Characteristics, Compensation, and Work Experiences of Adjunct and Other Non-Tenure-Track Faculty", Washington, DC, USA, GAO Report No. GAO-18-49, 2017



SUMMER SCHOOL 2012
University of Maine, Orono

Dr. Taryn Bayles

Teaching Professor
Vice Chair for UG Ed
University of Pittsburgh

Dr. Tony Butterfield

Associate Professor
(Lecturer),
University of Utah

Dr. Kevin Dahm

Professor,
Rowan University

Dr. Milo Koretsky

McDonnell Family
Bridge Professor,
Tufts University

CHEGWARTS

Laboratory of Chemical Engineering

Student Handbook

A GAME OF LABS

Comprehensive Rulebook

Brace yourselves.
Explanations are coming.

Initial attempts at game-based learning…

Pressing forward…

2012-Now(ish)

Dr. Dan Anastasio (Ph.D., 2015)

Associate Professor,
Rose Hulman Institute of Technology

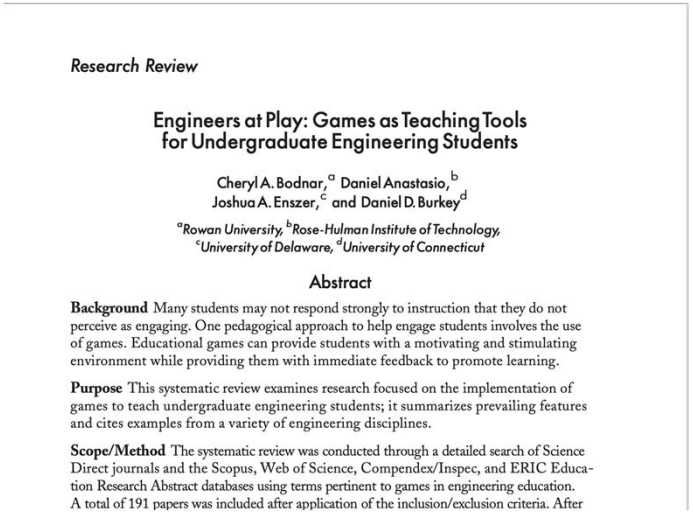
What I learned from Dan…

Dr. Cheryl Bodnar

Associate Professor,
Rowan University

Dr. Josh Enszer

Associate Professor,
University of Delaware



Research Review

Engineers at Play: Games as Teaching Tools for Undergraduate Engineering Students

Cheryl A. Bodnar,[a] Daniel Anastasio,[b] Joshua A. Enszer,[c] and Daniel D. Burkey[d]

[a]*Rowan University,* [b]*Rose-Hulman Institute of Technology,* [c]*University of Delaware,* [d]*University of Connecticut*

Abstract

Background Many students may not respond strongly to instruction that they do not perceive as engaging. One pedagogical approach to help engage students involves the use of games. Educational games can provide students with a motivating and stimulating environment while providing them with immediate feedback to promote learning.

Purpose This systematic review examines research focused on the implementation of games to teach undergraduate engineering students; it summarizes prevailing features and cites examples from a variety of engineering disciplines.

Scope/Method The systematic review was conducted through a detailed search of Science Direct journals and the Scopus, Web of Science, Compendex/Inspec, and ERIC Education Research Abstract databases using terms pertinent to games in engineering education. A total of 191 papers was included after application of the inclusion/exclusion criteria. After

JEE
JOURNAL OF ENGINEERING EDUCATION
THE RESEARCH JOURNAL FOR ENGINEERING EDUCATION

ASEE 2016
New Orleans, Louisiana

Dr. Matt Cooper

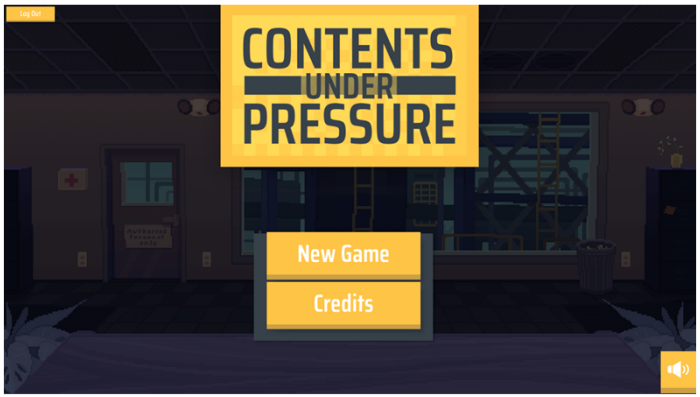
Teaching Associate Professor,
North Carolina State University

Same table at ASEE ChED Dinner

”A video game about process safety would be cool!”

”We should write a proposal about this…?”

“Collaborative Research: Experiential Process Safety Training for Chemical Engineers” – NSF IUSE #1711644



8 Publications in Journals or ASEE Proceedings,
9 presentations at National Meetings since 2017

Thousands of student-hours played across multiple universities

Three graduate students (UConn and Rowan)

Lots of avenues for future work and research!

Dr. Mike Young
Professor,
UConn School of Education

Dr. Jennifer Pascal
Associate Professor-In-Residence,
UConn

Dr. Scott Streiner
Visiting Assistant Professor,
University of Pittsburgh

Dr. Rich Cimino
Senior Lecturer,
NJIT

"Learning Engineering Ethics Through High-Impact Collaborative and Competitive Scenarios" – NSF IUSE #1934707

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UCONN

2012-2017

Non Tenure-Track
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UCONN

2017-Now

Non Tenure-Track
Full Professor
UCONN

Assistant/Associate Dept Head, CBE
UCONN

2010-2012

Associate Dean for Undergraduate Education & Diversity
UCONN

2013-Now

Dr. Matt Liberatore

Professor,
University of Toledo

Dr. Don Visco

Professor,
University of Akron

Dr. Daniel Lepek

Professor,
The Cooper Union

Dr. Margot Vigeant

Robert L. Rooke Professor,
Bucknell University

Dr. Ben Davis

Professor,
The Cooper Union

Dr. David Silverstein

PJC BoT Professor,
University of Kentucky-Paducah

Dr. Sarah Wilson

Assistant Professor,
University of Kentucky

“Research Initiation: Development of a Survey Instrument to Identify Mental Health Related Help-Seeking Beliefs in Engineering Students”

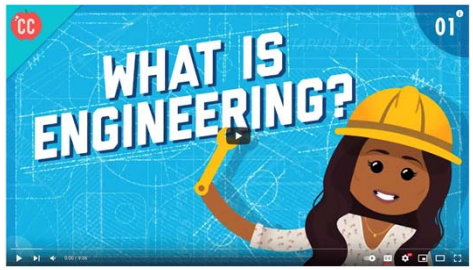
Dr. Sindia Rivera-Jiménez

Instructional Assistant Professor,
University of Florida
@SindiaSRj
@theengprofessor

“Research Initiation: Facilitating Professional Formation of Engineers through Strategic Agency of Engineering Faculty”

Dr. Lucas Landherr

Teaching Professor,
Northeastern University
@danteshepherd



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Full Professor
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Large, Public, Rural University

2013-Now

Associate Dean for Undergraduate Education & Diversity
Large, Public, Rural University

The road goes ever on…

C. Barry Carter
Professor and Head Emeritus

Doug Cooper
Professor and Head Emeritus

Ranjan Srivastava
Professor and Head

Dr. Jennifer Pascal
Associate Professor-In-Residence,
UConn

Dr. Jeff McCutcheon
Professor,
UConn

Kazem Kazerounian
Professor and Dean

…And all my other colleagues and students, too numerous to list!