

# Third Annual UGA STEM Institute on Teaching and Learning



Norbert J. Pienta  
University of Georgia

# Why are we here on Saturday morning?



Norbert J. Pienta  
University of Georgia

[npienta@uga.edu](mailto:npienta@uga.edu)

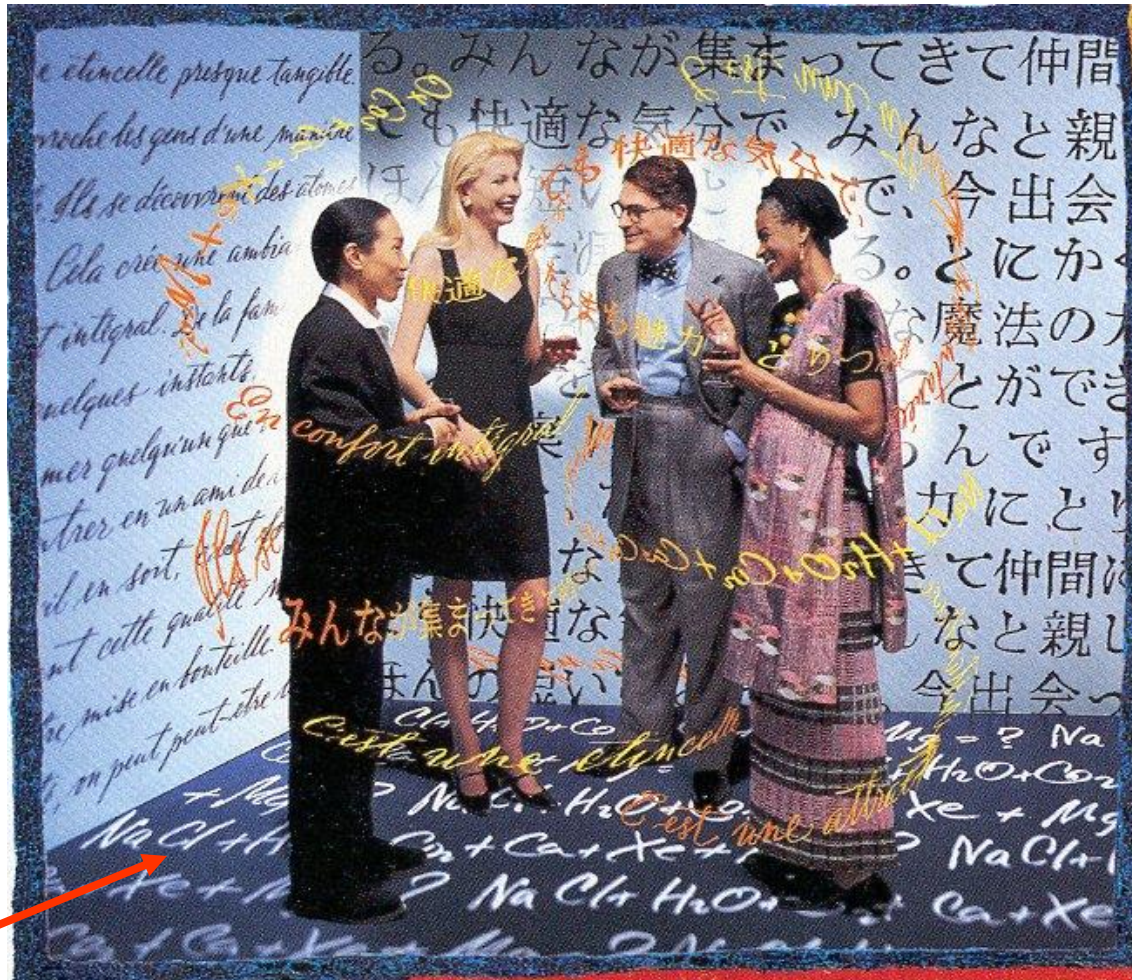


# Grand Marnier and Chemistry?

- Cryptic Notes
- Molecular models
- A Challenge?

Grand Marnier, slightly less mysterious than chemistry.

# A closer look...balancing equations





# Education Research: Use Evidence!

---

National Research Council report:

“...research is a process for obtaining information, and scholarship is a process for converting information into knowledge.”

*Assessing the Value of Research in the Chemical Sciences*, National Academies Press, 1998, p. 86

National Research Council, Board on Science Education:  
*Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering*

[http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE\\_072106](http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_072106)

❖ 1741 accepted ms (2009-14)

❖ [worditout.com](http://worditout.com)

Periodic General Environmental Correction  
Analytical Thermodynamics ConfChem Quantum  
Undergraduate Fluorescence Laboratory Method  
Teach Reaction Chemical Assessment Inquiry Advanced  
Classroom Writing Student Modeling  
Concepts Molecular Reactions Review Biochemistry  
Characterization Oxidation Case Announcements High Structure  
Effect Inorganic through Demonstration College Learning  
Acid Physical about Lab Chromatography School Use Global  
Models Compounds New Education Program  
Teaching Edition Energy Green Kinetics  
Developing Introduction NMR Gas Courses Model Data  
Properties Exercise Investigation Spectroscopy Experiments  
Introductory Water Theory Computational Course Science  
Research Project Atomic System Study  
Online Activity Students Simple Using  
Determination News Understanding Synthesis Organic  
Analysis Approach  
Development Experiment  
Conference Methods Liquid  
Equilibrium Curriculum

❖ 1741 accepted ms (2009-14)

❖ [worditout.com](http://worditout.com)

Periodic General Environmental Correction  
Analytical Thermodynamics ConfChem Qua  
Undergraduate Fluorescence Laboratory  
Teach Reaction Chemical Assessment  
Classroom Writing  
Concepts Molecular Reactions Student  
Characterization Oxidation Case Announcements Review  
Effect Inorganic through Demonstration High Stru  
Acid Physical about Lab Chromatography College  
Models Compounds New Education School  
Teaching Edition Energy Green Kinet  
Developing Introduction NMR Gas Courses Mode  
Properties Exercise Investigation Spectroscopy Expe  
Introductory Water Theory Computational Course  
Research Project Atomic System  
Online Activity Students Simple Using  
Determination News Understanding Synthesis  
Chemistry Analysis Approach  
Development Experiment  
Conference Methods Liquids  
Equilibrium Curriculum

- Laboratory
- Writing
- Inquiry
- Modeling
- Effect
- Global
- Model
- Investigation
- Online
- Activity
- Analysis
- Approach

- ❖ Science Scores, Measures of Success, and National Competitiveness
- ❖ Energy in the Age of Sustainability
- ❖ Making the 2013 National Chemistry Week Theme a Personal Matter
- ❖ New Guidelines for Chemistry Education Research Manuscripts and Future Directions of the Field
- ❖ Defining a Playing Field: Where Does “Pre-Med” Fit?
- ❖ Online Courses in Chemistry: Salvation or Downfall?
- ❖ Innocents Abroad: A Journal’s Outreach to India
- ❖ Cutting-Edge and Cross-Cutting: Connecting the Dots between Nanotechnology and High School Chemistry
- ❖ Navigating the Landscape of Assessment
- ❖ Cherry Picking: Why We Must Not Let Negativity Dominance Affect Our Interactions with Students
- ❖ Science Education for Global Sustainability: What Is Necessary for Teaching, Learning, and Assessment Strategies?



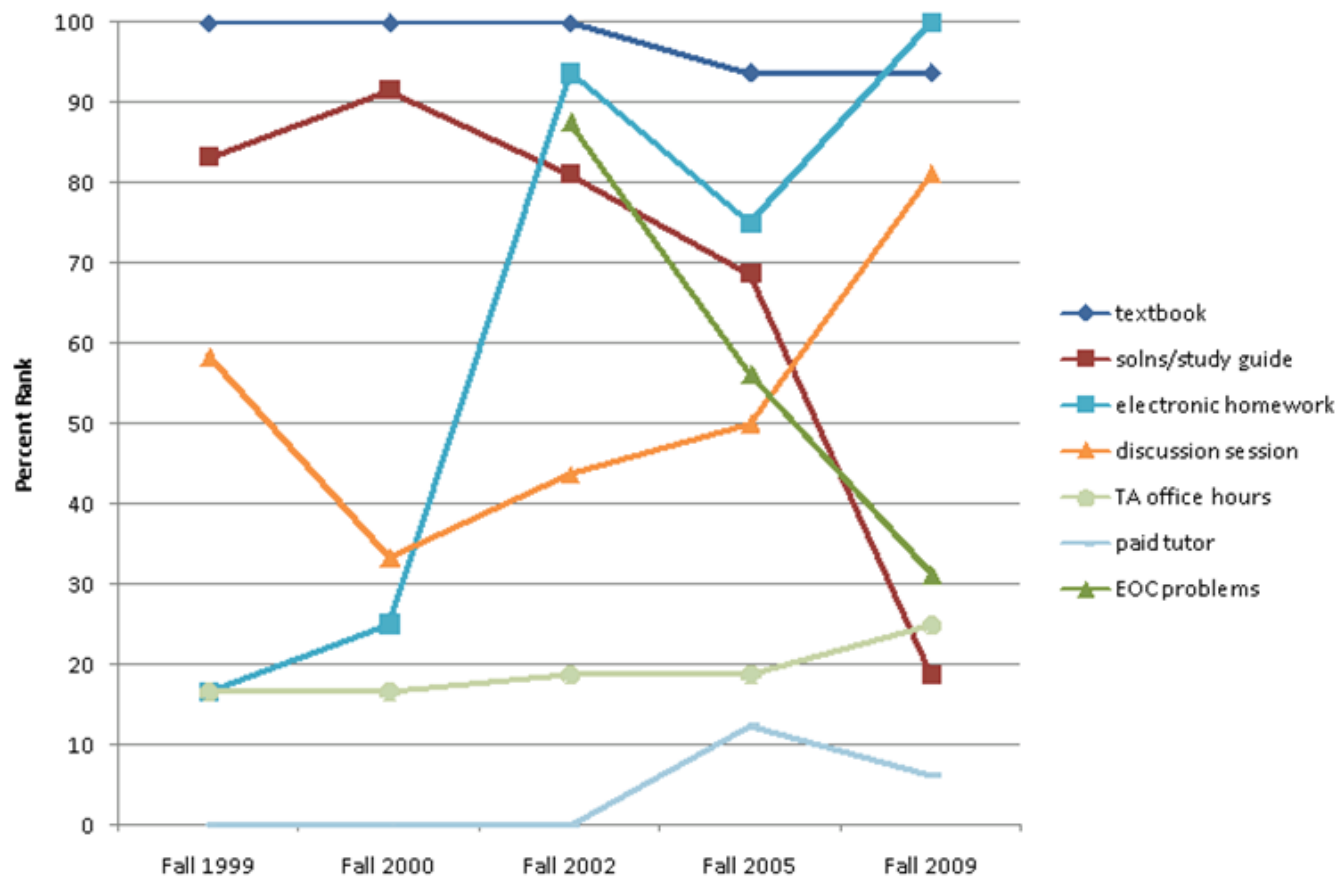
## ❖ Editorials (2012-14)

- ❖ Science Scores, Measures of Success, and National Competitiveness
- ❖ Energy in the Age of Sustainability
- ❖ Making the 2013 National Chemistry Week Theme a Personal Matter
- ❖ New Guidelines for Chemistry: Future Directions of the Field
- ❖ Defining a Playing Field: Where?
- ❖ Online Courses in Chemistry: Success or Failure?
- ❖ Innocents Abroad: A Journal's Perspective
- ❖ Cutting-Edge and Cross-Cutting: Nanotechnology and High School Chemistry
- ❖ Navigating the Landscape of Assessment
- ❖ Cherry Picking: Why We Must Not Let Negativity Dominance Affect Our Interactions with Students
- ❖ Science Education for Global Sustainability: What Is Necessary for Teaching, Learning, and Assessment Strategies?

- Testing and assessment
- Sustainability: next gen students
- Research and evidence
- MCAT and pre-meds
- Online and MOOCs
- Global issues / questions
- Student diversity



# Which components helped you learn?



*“General chemistry student surveys: Longitudinal data about which factors helped them learn” in Investigating Classroom Myths through Research on Teaching and Learning, D. Bunce, ed., ACS Symposium Series, 2011*



# More things to fight about...

---

## Delivery of content

- Traditional vs e-books [What do they read?]
- Flipping classrooms

## Optimal use of time / space

- Laboratories: simulation vs wet chemistry?
- SCALE-UP / Studio classrooms / labs

## Management of expectations

- DFW [It's not just an airport in Texas.]
- student, parent, department, organization