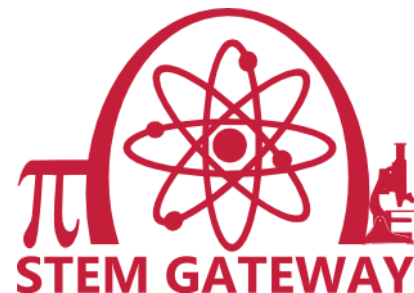




*Department of Chemistry & Chemical Biology*



# **General Chemistry I: A Course Redesign Experience**

Presenters: Sushilla Knottenbelt, K. Joseph Ho, Sarah Toews Keating

Authors: The CHEM 121 Course Reform Team (K. Joseph Ho, Sarah Toews Keating, David Keller, Sushilla Knottenbelt, Clarissa Sorensen-Unruh, Shaorong Yang) and CHEM 121 instructors in Fall 2013 (see above, Diana Habel-Rodriguez, Gregory Smith)

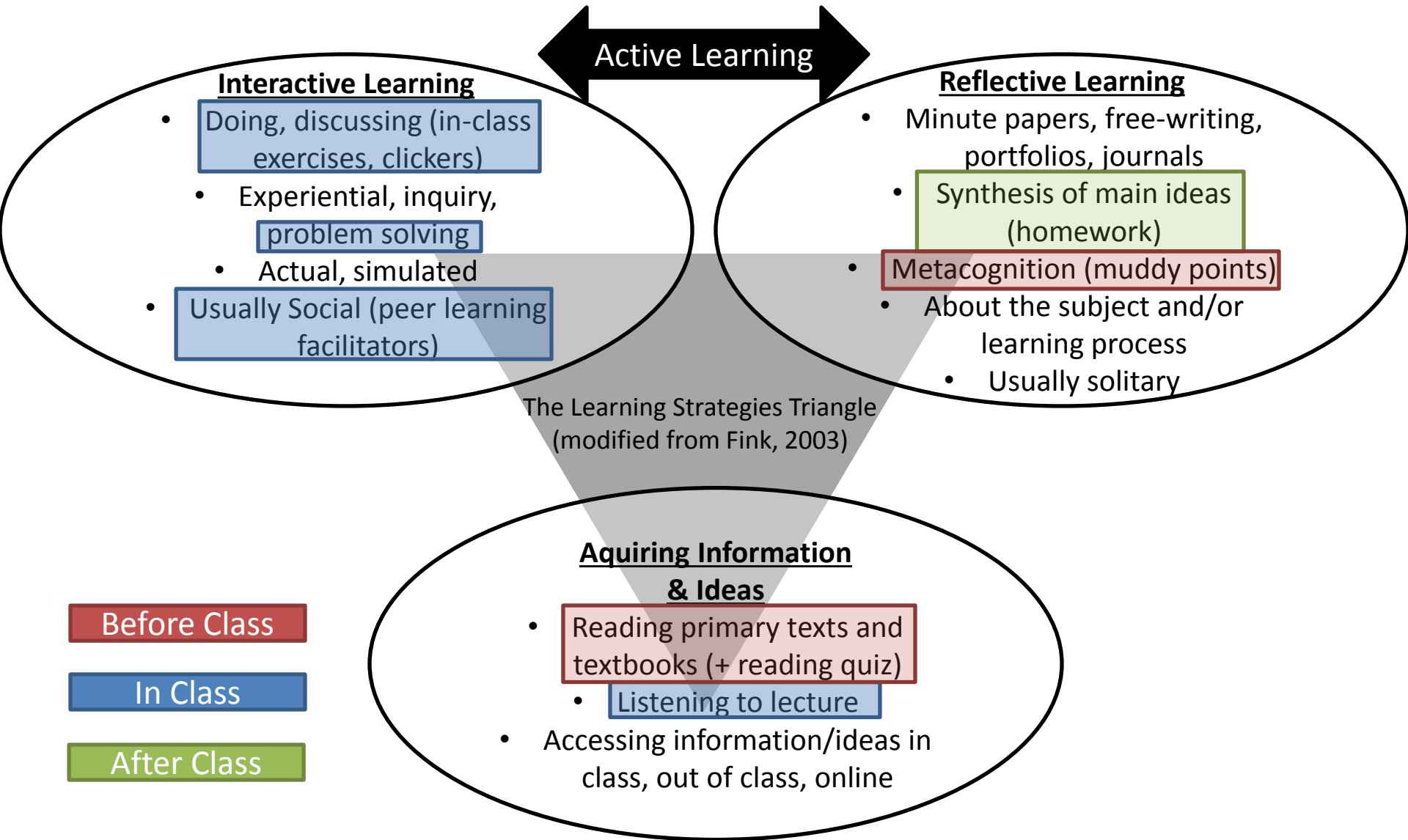
# Why Redesign General Chemistry?



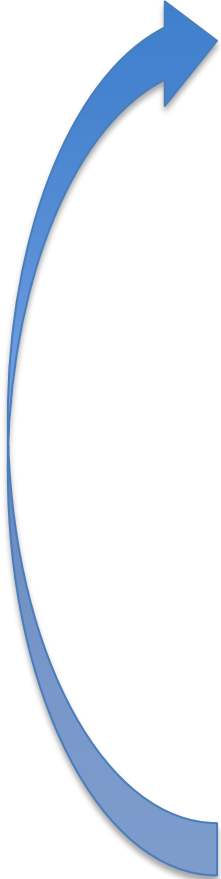
- CHEM 121 required for >20 degree programs at UNM
- Historical DFW for CHEM 121 and CHEM 122 between 20 and 50%
- Students persisting in STEM have As and Bs in CHEM 121\*
- UNM has a high % of under-represented minorities and first generation students

\* STEM GATEWAY PROGRAM DATA

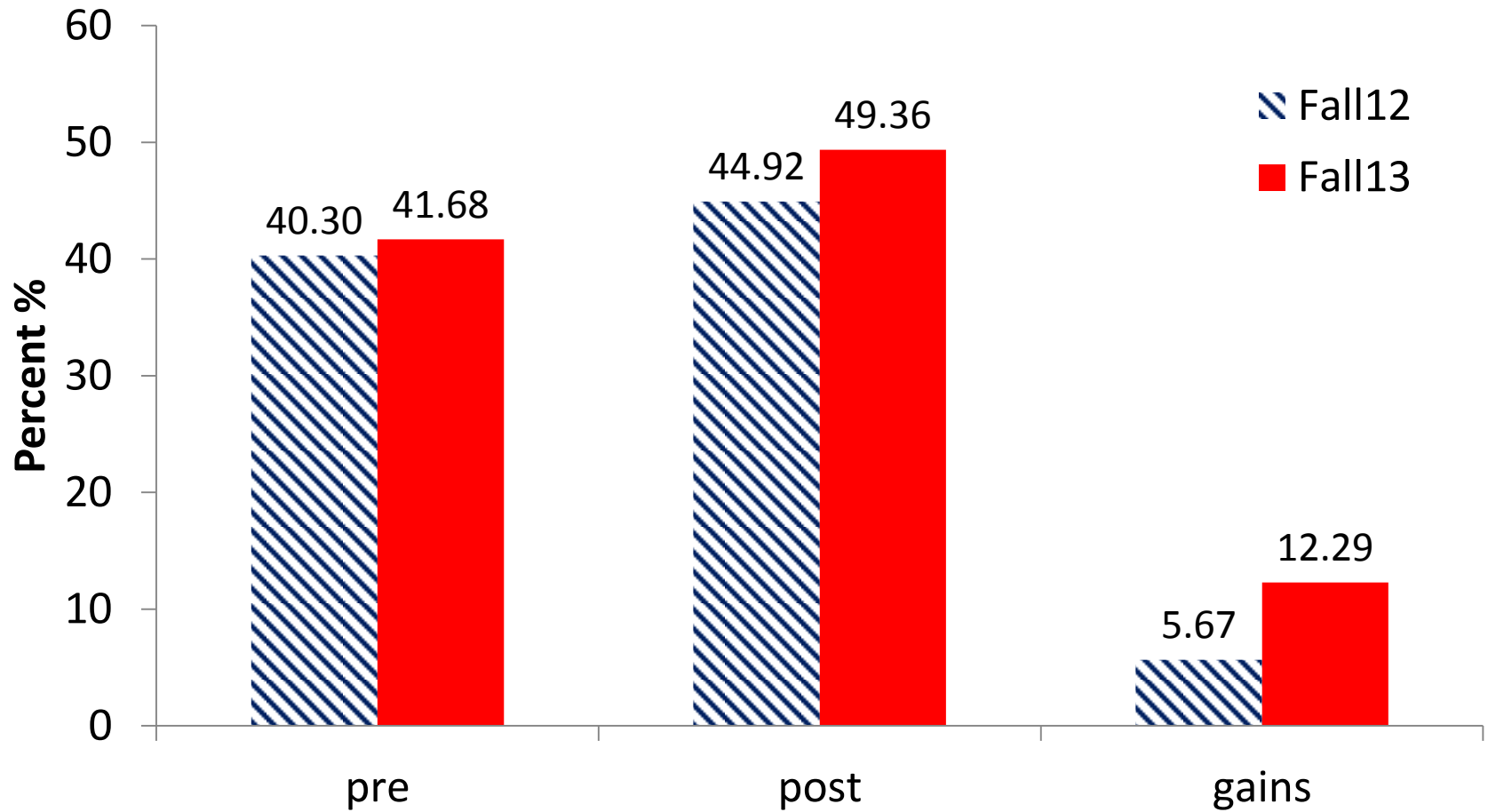
# Major Themes of the Redesign



## Getting started:

- 
- Identify key areas of difficulty (concept inventory data)
  - Develop course materials to target these areas
  - Promote use of active-learning techniques with new instructors.
  - Implement in Fall 2013 and assess
    - 4 sections taught using full redesign
    - 2 sections taught with elements of redesign
    - *Instructors from all 6 sections participated in regular meetings and discussion.*

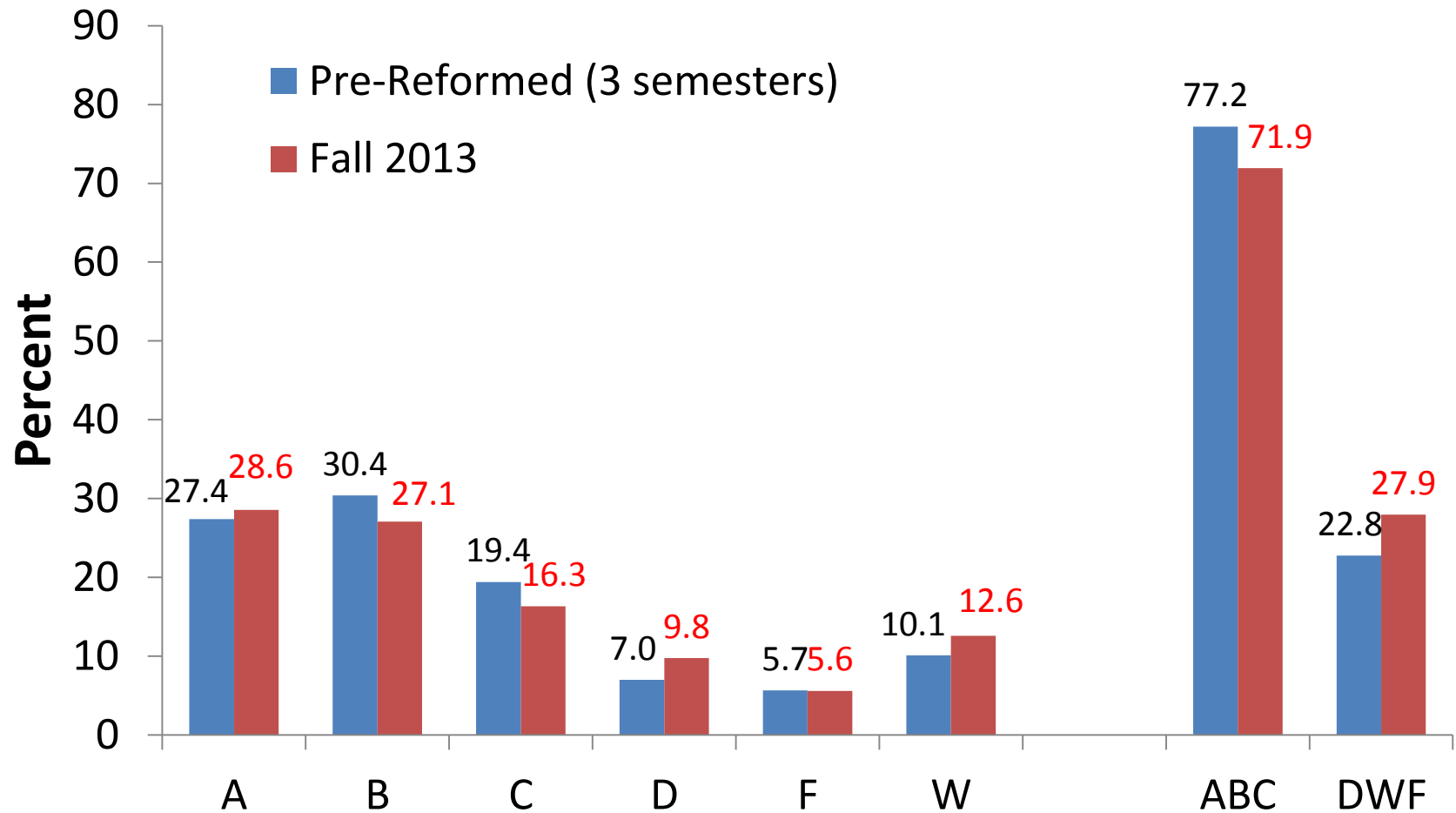
# Assessment: How Our Students Perform Now:



# How Our Students Perform Now:

Spring13	Chem121 Final Exam						
	1	2	Mean				
Final	64.03	64.28	64.16				
Fall13	CHEM 121 Final Exam						Mean
	1	2	3	4	5	6	
Final	57.95	60.93	69.56	65.03	65.68	66.08	64.21

# How Our Students Perform Now:



# Evaluating the redesign: instructors' perspective

- Learning curve
- Attendance
- Engagement
- Achievement
- Classroom environment



# Next Steps or Future Work

- Do active learning strategies of this reformed approach adequately prepare students to be successful in the next science courses?
- Does the reformed approach benefit a special group of students?
- How to extend the scope:
  - helping faculty new to active-learning to implement it
  - Sharing our experience in other courses and or disciplines

# Acknowledgements

- The STEM Gateway Program
- Dr. Gary Smith
- Dr. Stephen Cabaniss

# Questions? (for NMHEAR)

- Our specific course redesign questions
  - how best to close the assessment loop?
  - how to extend the impact (including new instructors)?
  - what constitutes active learning?
- Also – if you are an instructor what are you currently doing in your classes along these lines, if administrator, what is being done at your institution
- What are your goals for your class/institution with respect to active learning?
- What are your questions for us about your specific class/institution?