Assessment Council Grants 2013-14

A Presentation and Discussion of Results

Overview

- 3-4:15 – Presentations by 2013-14 Assessment Grant Recipients
  - Beth DePalma Digeser, History
  - Susannah Scott and Mike Gordon, Chemical Engineering, and Dr. Lubella Lenaburg, Center for Science and Engineering Partnerships
  - Linda Adler-Kassner, Writing Program
  - Paige Digeser and Lorraine McDonnell, Political Science
  - Kelly Bedard and Jon Sonstelie, Economics
- Closing remarks: Interim EVC Joel Michaelsen
- 4:15-5:30 Reception hosted by Interim EVC Joel Michaelsen

Assessment Project

Department of History

The Problem

- Research requirement in the major: either a proseminar (P), directed readings (DR), two-quarter history of public policy senior thesis, or two-quarter honors seminar
- Full range of skills (historical questions, finding/analyzing sources, evaluating context, crafting argument)
- Faculty members report anecdotally that students are poorly prepared→hence DR

First steps

- Do students taking different course sequences perform differently?
- Do students taking a cluster of courses in the area of the P or DR perform differently?

- Result: we're all above average…. (61% A range)

Method, 2013-14

- Hired Chris Kegerreis to conduct 30-60 minute interviews with 41 faculty members about their experiences teaching their courses
- Chris collected & analyzed syllabi and handouts, seeking to know…

Questions

- What do faculty see as the most common obstacles to student success in P, DR and two-quarter seminars?
- How do faculty structure their courses to help students acquire the skills needed for good research writing?
- What types of assignments do faculty give in earlier courses to help students acquire these skills?

Answers

- Vast majority identified a range of significant obstacles to student success, but still think majors should write a major research paper
- More students enrolled in P courses; more faculty taught P courses
- Approaches to DR courses vary widely & people wanted goals clarified
- Majors have few opportunities to develop research skills in other department courses
- Perception on students' part is that DR courses are harder (separate survey)

Recommendations

- Incorporate “low stakes” research assignments across the curriculum
- Teaching workshops
- Faculty retreat…

Decisions at last week's retreat

- Teaching workshops
- Low stakes research assignments
- New courses:
  - Research seminar (required): goal as capstone, guidance on primary sources, archives, field specific methods, instructor can choose focus or theme, some common readings ok, 15-25 page paper; 15 students
  - Reading seminar (encouraged): 20 students, 12-25 p paper, common readings across most of the quarter
- Evaluate a couple of years in to the new arrangement

Assessment of Technical Writing Skills Acquisition in Chemical Engineering

2013-14 UCSB Assessment Grant

Prof. Susannah Scott, Chem. Engr.

Prof. Michael Gordon, Chem. Engr.

Dr. Lubella Lenaburg, CSEP

Ms. Anne Emerson Leak, CSEP

14 May 2014

CHEMICAL ENGINEERING
UC SANTA BARBARA

CALIFORNIA NANOSYSTEMS INSTITUTE
UNIVERSITY OF CALIFORNIA SANTA BARBARA
CSEP CENTER FOR SCIENCE AND ENGINEERING PARTNERSHIPS

Technical writing is a critical skill

ABET (Accreditation Board for Engineering and Technology)

<u>Student Learning Outcome:</u>

- the ability to communicate effectively through written reports and oral presentations

(Even) for engineering graduates, effective communication is one of skills employers rate most desirable.

Most of the current Chemical Engineering curriculum focuses on developing technical skills.

ChE 180A/B laboratory courses

Two, 1-quarter lab courses (Jr/Sr years)

8 experiments (10 hrs in lab/expt.)

Hands-on training in ChE unit operations

8 written reports

Only discipline-specific training in technical writing

Problem areas

- No formal instruction in technical writing
- Non-uniform expectations for, and grading of, reports
- Widespread frustration among both students and faculty
- High faculty turnover

Our assessment project

Goal: Train Chemical Engineering students for greater proficiency in technical writing

Approach

- Identify and clearly articulate faculty expectations for writing
- Assess quality of student writing and instructor feedback
- Provide basis for course improvement by identifying more effective instructional strategies

Assessment methodology

Prior to revising ChE 180B:

- Develop rubric to evaluate written lab reports
- Use rubric to assess representative sample of lab reports from 2010-13 ChE 180A/B cohorts

After revising ChE 180B:

- Use rubric to assess lab reports of 9 student groups from W14 cohort
- Conduct student surveys and focus group interviews

Components of the new rubric

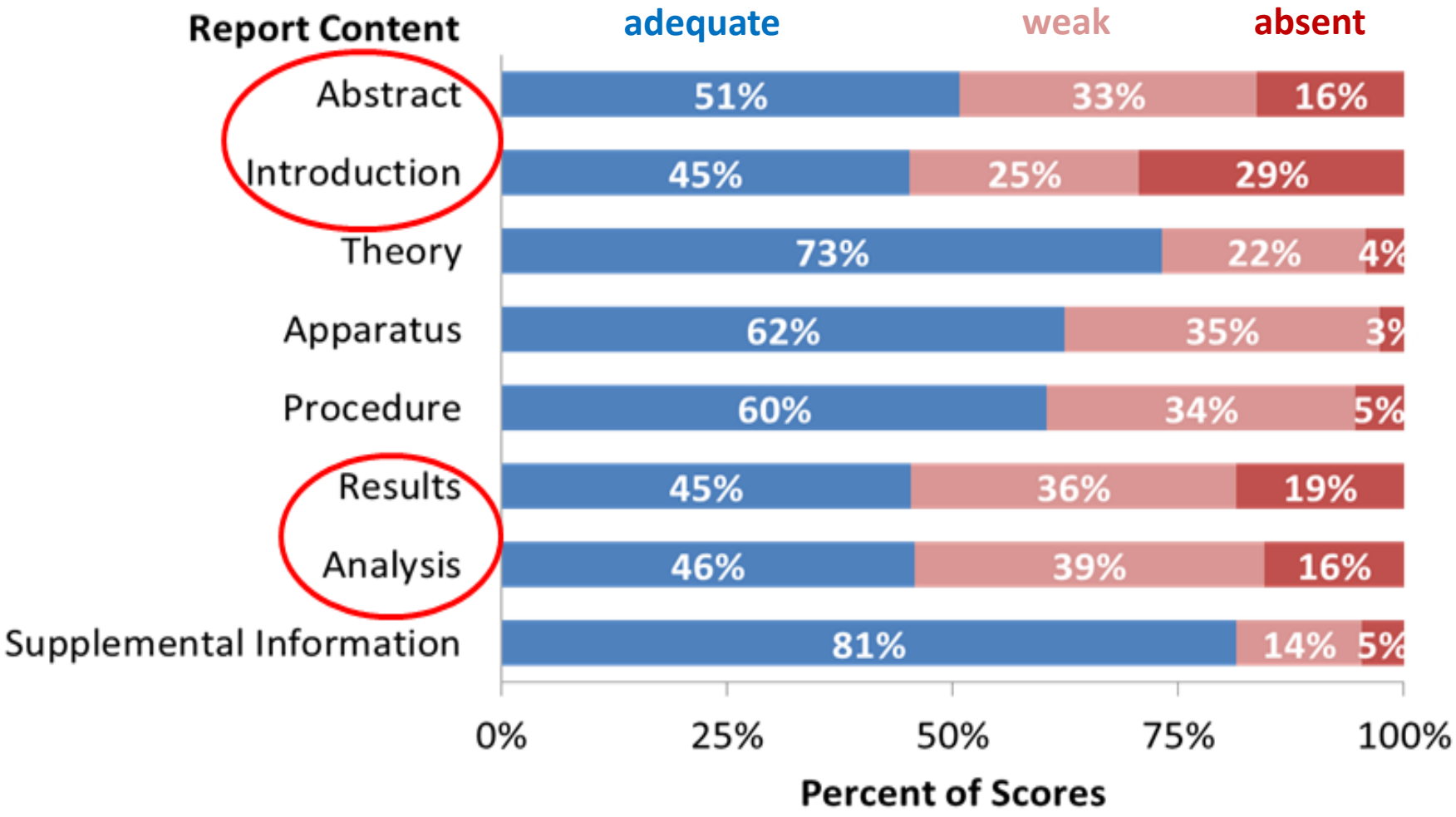
Content

- Abstract
- Introduction & theory
- Description of apparatus
- Experimental procedure
- Results
- Analysis and discussion of results
  - Results of experiment in context of lab objectives are given
  - Critical assessment of results given (data quality, models, problems)
  - Recommendations for future lab experiments

Writing mechanics

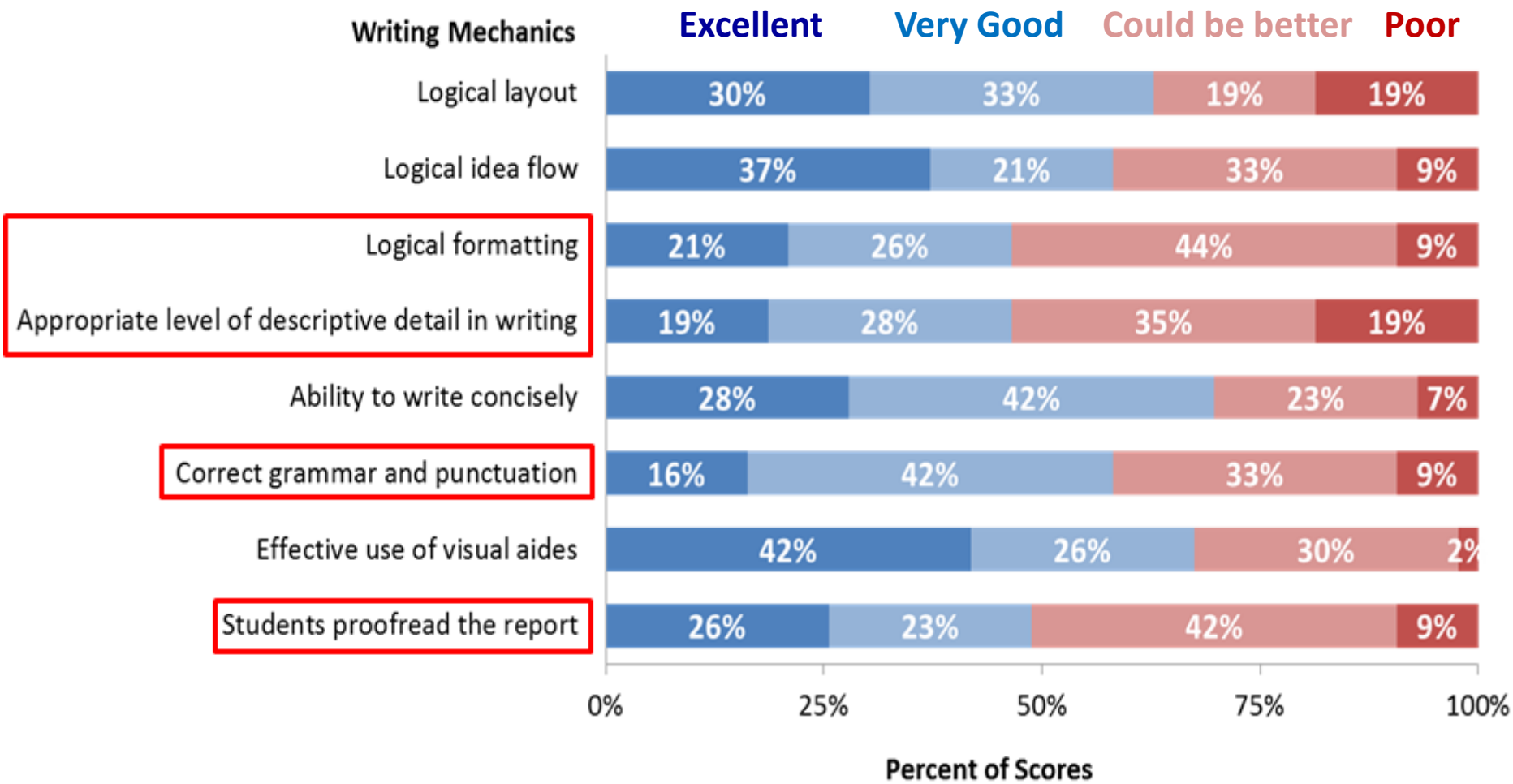
  - Logical layout, idea flow, and formatting
  - Appropriate level of descriptive detail
  - Ability to write concisely

2010-13 content assessment



- Major deficiencies in areas requiring interpretation and summarizing

2010-13 writing mechanics assessment



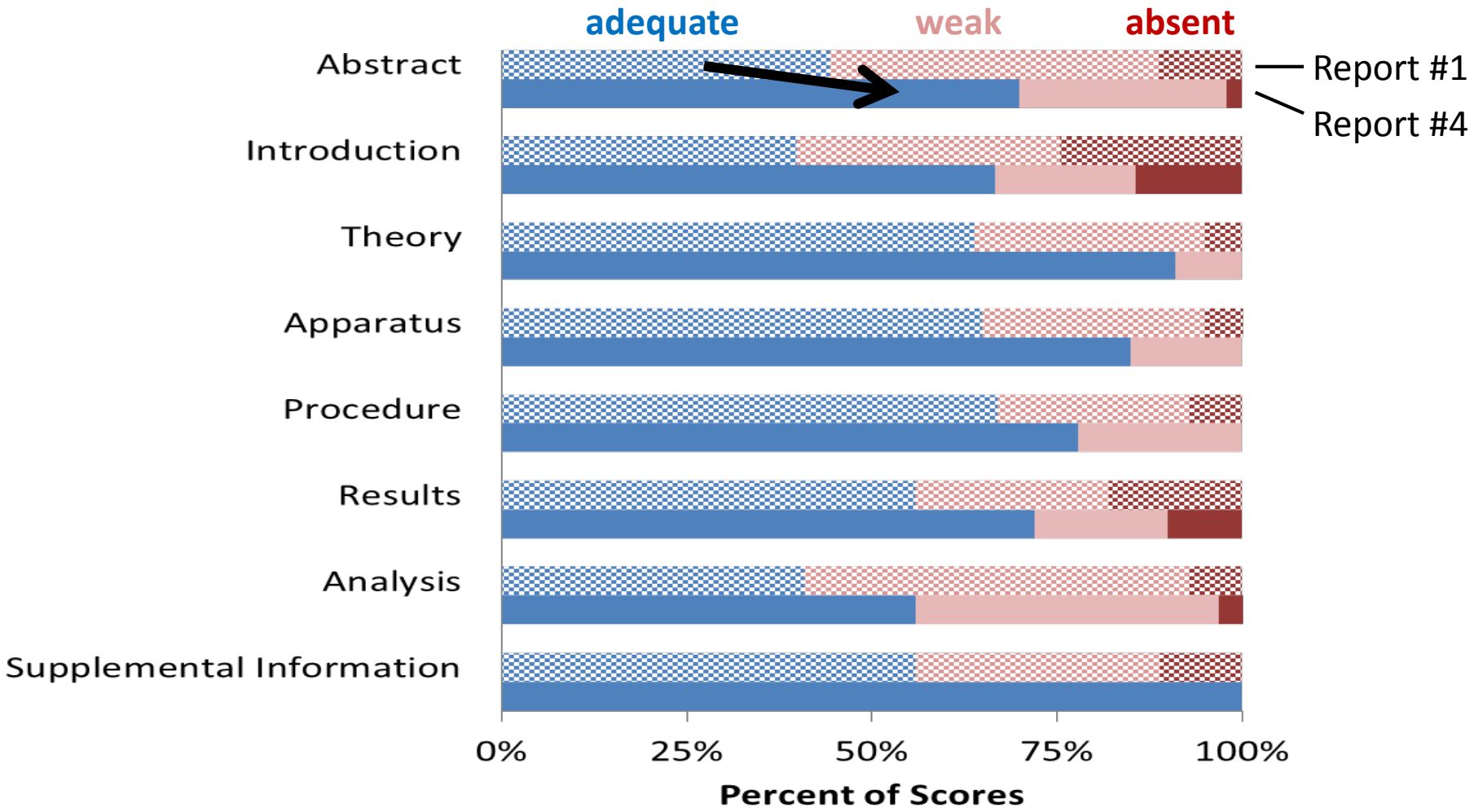
- Overall weakness suggests need for more formal instruction

→ 2014 ChE 180A/B courses revised in light of these findings

Changes in W14 ChE 180B course

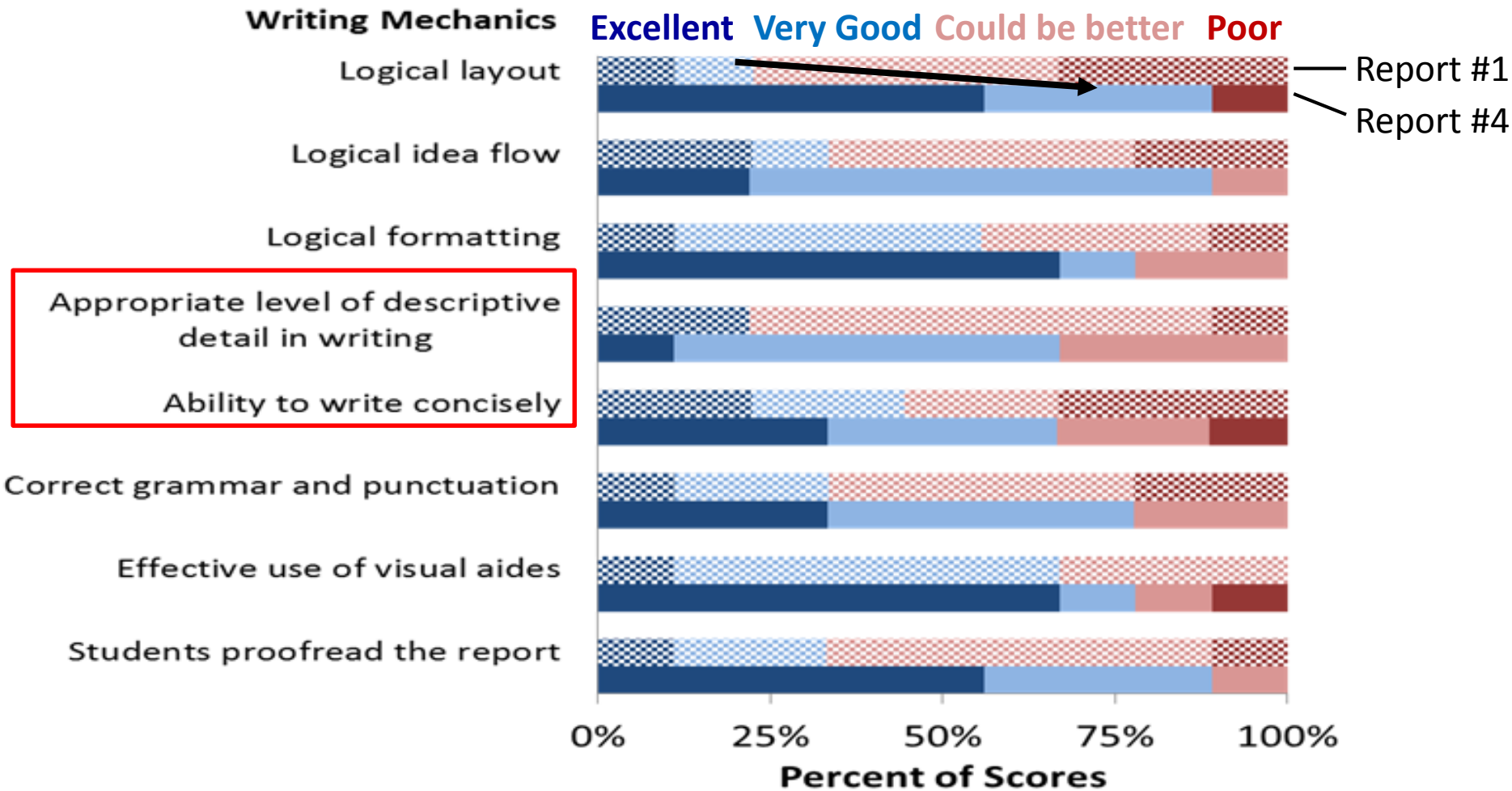
- Clear expectations for reports (*students given rubric*)
- Useful technical writing instruction and pre-lab assignments
- Greater availability of professors
- Helpful and timely written and verbal feedback on lab reports
- Functioning lab equipment and lab notebook support

W14 content assessment



- Overall reduction in missing content
- General improvement in all content areas

W14 writing mechanics assessment



- Modest increase in writing skills seen across the board
- **Hypothesis: significant improvement in writing mechanics requires earlier intervention (prior to lab courses)**

Next steps

2014-15 UCSB Assessment Grant

"Assessing the Integration of Technical Writing Instruction in Upper Division Chemical Engineering Coursework"

- Continue to modify and assess ChE lab courses
  - ChE 180A (S14), ChE 180B (W15), ChE 180A (S15)
- Broaden faculty involvement
  - Scott, Gordon, Helgeson, O'Malley
- Incorporate technical writing into earlier courses and assess subsequent impact on lab reports
  - ChE 128: Separations & ChE 132B: Numerical Methods (F14)
  - ChE 120B: Heat Transfer (W15)

<u>Long-term goal</u>: Formulate integrated, program-wide plan for technical writing instruction in ChE

GE Area A Assessment

English Reading and Composition

Linda Adler-Kassner
Christopher Dean
Randalyn Browning
UCSB Writing Program faculty

Assessment Questions

- To what extent does the writing of selected lower division students demonstrate achievement of the revised goals of Writing 2 (the course fulfilling the Area A1 requirement) at a consistent or general level?

- To what extent does the writing of selected upper division students demonstrate achievement of the goals of upper division writing courses (courses fulfilling the Area A2 requirement in the Writing 105, Writing 107, and Writing 109 sequences and in English 10) at a consistent or general level?

Area A Outcomes

Students who successfully complete two required Area A courses will be able to:

- Produce writing that demonstrates the ability to **conduct inquiry in specific contexts using appropriate sources** (e.g., academic and non-academic sources; digital and print sources) and methods
- **Apply analysis of purposes, audiences, and contexts** for writing to the production of written work
- Use flexible processes for writing, reading, research, and analysis to formulate and express ideas
- **Reflect on processes** for writing, reading, and analysis and **consider the relationships between those processes and specific purposes, audiences, and contexts for writing**
- **Develop and apply strategies to address unintentional violations** of conventions of content, form, citation, style, mechanics, and syntax

Area A courses/focus

- A1 (Writing 2): Strategies for studying writing in specific contexts (i.e., disciplines and interdisciplines).
  - **Fulfilled only by Writing 2**
- A2: Study of and practice with writing in specific contexts.
  - **Fulfilled by Writing 105, 107, 109 courses and by English 10**.
- WP annual GE enrollments=7500 students
- English 10 annual enrollment=400-500 students

In this assessment

- Writing 2 (also 2Engineering)
- Writing 105 (study of writing and writing in inter/cross-disciplinary contexts)
  - 105M, Multimedia Writing
  - 105PD, Writing and Public Discourse
  - 105R, Writing and Rhetoric
  - 105C, Creative Non-Fiction
- Writing 107 (writing in professional contexts)
  - 107B, Writing for Business and Administration
  - 107G, Professional Writing for Global Careers
- Writing 109 (writing in academic contexts)
  - 109SS, Writing for Social Sciences
  - 109HU, Writing for Humanities
  - 109HP, Writing for Health Professions
  - 109ST, Writing for Science and Technology
- English 10

313 total student submissions (some comprised of multiple pieces)

Process

September 2013-April 2014

Faculty workshops, iterative review, piloting, revision to create scoring guides that address two questions:

1. What do characteristics of the Area A1/A2 outcomes look like in <this class>?
2. Working from existing student writing, what does:
   - Exemplary
   - Proficient
   - Developing

work with this outcome look like in <this class>?

Students who successfully complete 2 Area A courses will be able to:

Outcome 1: Produce writing that demonstrates the ability to conduct inquiry in specific contexts using appropriate sources (e.g., academic and non-academic sources; digital and print sources) and methods.

Focus:

- Implicit or explicit framing through insightful questions that demonstrate engagement and drive analysis
- Use of appropriate and credible sources
- Contribution of sources to the writer's analysis
- Distinction between ideas from sources and those from the writer

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The submission:			
Is implicitly or explicitly framed by insightful question(s) that demonstrate the writer's engagement with the topic and drive the analysis throughout	Reflects a clear attempt to frame question(s) that demonstrate the writer's engagement with the topic and drive the analysis throughout	Reflects some attempt to frame a question(s) of interest to the writer that is related in some ways to the analysis	Does not frame a question(s) of interest that demonstrates the writer's engagement with the topic or relates to the analysis

The submission:			
Consistently uses appropriate and credible sources (primary or secondary) relative to the questions in the writing	Generally uses appropriate and credible sources (primary or secondary) relative to the questions in the writing	Shows some attempts to use appropriate and credible sources (primary or secondary) relative to the questions in the writing, and to evaluate the strengths and limitations of the claims and reliability of sources, but these attempts are inconsistent	Does not use appropriate and credible sources (primary or secondary) relative to the questions in the writing

The submission:			
Uses ideas from sources in ways that extend, enrich, or support the writer's own insight and analysis	Uses ideas from sources that reflect, but don't necessarily contribute to, the writer's insight and analysis	Shows some attempts to link ideas to sources used in the writing but analysis and understanding of the sources may be lacking, and the development of the writer's own ideas may be insufficient	Does not link ideas to sources used in the writing or sources do not contribute to writer's insight and analysis

The submission:			
Consistently distinguishes ideas that are the writer's from those of sources	Generally distinguishes ideas that are the writer's from those of the sources	Inconsistently distinguishes ideas that are the writer's from those of the sources	Does not distinguish ideas that are the writer's from those of the sources

Your overall rating of Outcome #1:			
Exemplary	Proficient	Developing	Not present

GE Area A Assessment – PRELIMINARY Results Part 1

% Rated "Exemplary" / "Proficient"

	Writing 2			Upper Division Writing		
	1. AP 3+ n = 50	*2. AWPE Placement* n = 64	*Total WRIT2* n = 114	*3. Transfer* n = 52	*4. Non-Transfer* n = 119	*Total UD WRIT* n = 171
Outcome #1	74%	73%	74%	71%	74%	73%
Outcome #2	78%	81%	80%	56%	74%	68%
Outcome #3	86%	81%	83%	56%	70%	66%
Outcome #4	70%	80%	75%	60%	72%	68%
Overall Submission	74%	78%	76%	63%	75%	71%

Results part 2

- Intensive discussions about qualities associated with outcomes in 9 high-enrolling WP courses and English 10
- Articulation of characteristics of exemplary/proficient/developing work with these qualities
- Analysis of scoring

Next steps

- English 10 reading: end of spring term
- Writing Program efforts have led to:
  - Work by WP course committees on course-level outcomes and curriculum guides/guidelines
  - Attention to (/revisions of) assignments used to achieve outcomes for A2 in different courses
  - Consideration of Area A outcomes

ASSESSING PROGRAM LEARNING OUTCOMES THROUGH STUDENT WORK

DEPARTMENT OF POLITICAL SCIENCE

Paige Digeser
Lisa Argyle
Lorraine McDonnell
Cecilia Farfan-Mendez
Margarita Safronova

RESEARCH QUESTION

1. Can coverage and student mastery of the Department's PLOs be validly measured through student work?

2. Can we achieve acceptable levels of reliability using graduate students to score the sampled work?

3. With a modest budget can a portfolio assessment be maintained on an ongoing basis, including drawing the student sample, collecting multiple pieces of work over several years, scoring it, and using the results to inform program improvement efforts?

RATIONALE FOR A PORTFOLIO STRATEGY

Standardized assessments for measuring mastery of political science content do not reflect our curriculum, so we had to develop a feasible alternative. Our approach is consistent with emerging national efforts to measure learning using student course assignments (*Chronicle of Higher Education*, 4/25/14, p. 16)

METHODOLOGY

- Six faculty operationalized the PLOs by identifying four or five dimensions that define major components of each.
- Ladder faculty reported levels of PLO/dimension coverage for undergraduate courses ("major emphasis," "moderately covered," "briefly taught," and "not taught"). A curriculum map was prepared.
- Coursework was collected from a sample of 59 students over three quarters from an average of 2.4 courses/student. Final exams and papers were collected from 18 courses; midterms were also collected in eight of them (artifact N=341).

METHODOLOGY (cont.)

- Scoring rubrics developed to measure PLO/dimension coverage and to gauge student mastery at four levels on five criteria (substantive understanding, argument, evidence, clarity and style, and structure).
- All assignments were double-coded, and the scores moderated. Decisions made in developing scoring rubrics and coding procedures were documented.
- Data analysis estimated the match between PLO coverage reported on the curriculum map and in course assignments, and on student mastery controlling for level of coverage.

PRELIMINARY FINDINGS

- Student mastery of majority of PLOs increases as they take more courses. For example, average score on effective writing PLO is 40% higher for students who have taken four or more political science courses (2.3 on a four-point scale), as compared with those who have taken only one course (1.64).
  - However, there are some anomalies--most likely due to the course sample and the truncated time period for the project. Further investigation is needed for one or two PLOs, but we expect the overall result to hold.
- There is a high degree of agreement between ladder faculty's self-reports about level of PLO coverage in their courses and the graduate coders' assessment of coverage in course assignments (correlation=.83 fall 2013; .87 winter 2014).

NB: Coders did **not** see the curriculum map based on faculty self-reports until they had completed all the coding of assignments.

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TENTATIVE IMPLICATIONS OF PILOT STUDY

- PLO coverage and student mastery can be measured through course assignments. (Research Q. 1)
- Although coding of two assignments (typically a paper and final exam) produces a reasonably valid measure of PLO coverage, some coverage is lost (e.g., if a final exam does not cover the entire course). Trade off: greater content validity, but higher data collection costs.
- Acceptable levels of inter-coder reliability can be reached. However, the graduate RAs' initial role as co-designers of the pilot means that we have not yet routinized training and score moderation for successive groups of coders. (Research Q. 2)

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TENTATIVE IMPLICATIONS OF PILOT STUDY (cont.)

- Because of the additional costs of designing and conducting a pilot study, we do not yet have an accurate cost estimate for an operational system. (Research Q. 3)
  - An operational portfolio assessment would extend over several years and four courses for each sampled student cohort. Student cohorts would be sampled every two or three years.
- Even our preliminary findings suggest areas for discussion about program improvement (e.g, the differential emphasis given PLOs across courses).

Economics Assessment

Test of Understanding in College Economics (TUCE)

Kelly Bedard and Jon Sonstelie, Department of Economics

Test of Understanding in College Economics (TUCE)

- Developed by the National Council on Economic Education
- Nationally normed
- Microeconomics and Macroeconomics

Microeconomics Test

- The Basic Economic Problem (scarcity, opportunity cost, choice)
- Markets and Price Determination (determinants of supply and demand, utility, elasticity, price ceilings and floors)
- Theories of the Firm (revenues, costs, marginal analysis, market structures)
- Factor Markets (wages, rents, interest, profits, income distribution)
- The (Microeconomic) Role of Government in a Market Economy (public goods, maintaining competition, externalities, taxation, income redistribution, public choice)
- International Economics (comparative advantage, trade barriers, exchange rates)

Our Sample

- We tested 1738 students in late September and early October 2014
- 10 questions from the 30 question TUCE test
- Questions were randomly drawn within topics
- There were 6 different forms

Test Scores at a Glance

- Test scores converted to 30 point equivalent

	Score	Sample Size
Econ 9	11.3	189
Econ 1	13.9	547
Econ 10A	15.4	512
Econ UD	17.3	373

	TUCE Norming Sample	UCSB Students
Year Standing		
Freshman	9.4	13.9
Sophomore	9.4	14.9
Junior	9.4	14.6
Senior	9.4	16.4
Gender		
Women	9.0	13.5
Men	9.6	15.8
Race/Ethnicity		
White	9.5	15.6
African-American/Black	8.3	13.7
Hispanic/Latino	9.4	14.0
American Indian/Alaska Native	9.8	15.4
Other	9.3	14.7
Institution Type		
Associate's College	9.4	--
Baccalaureate College	9.7	--
Master's College / University	9.2	--
Doctoral/Research University	9.7	14.9

	TUCE Norming Sample	UCSB Students
GPA		
2.00-2.99	8.8	13.9
3.00-4.00	9.7	15.6
Major / Intended Major		
Economics	10.5	15.8
Non-Economics	9.6	13.2
Number of Economics Courses		
None	9.2	13.2
One	9.7	--
Two	9.8	15.5
Three	9.7	--
Four or More	12.5	17.3

Transfer Students and Minorities

	All		White		Chicano/Latino	
	Econ 10A	Econ UD	Econ 10A	Econ UD	Econ 10A	Econ UD
Econ Major						
Freshman Entry	17.7	18.9	18.7	19.6	18.9	18.7
Transfer	13.7	17.8	14.6	17.8	13.0	20.4
Econ & Acc Major						
Freshman Entry	16.6	17.8	15.5	18.1	15.2	19.5
Transfer	14.0	16.1	15.3	17.0	15.6	23.3

Correct Answers by Area

	Fraction Correct Answers				
	Econ 9	Econ 1	Econ 10A	Econ UD	Number of Questions
Basic	0.31	0.57	0.51	0.61	2
Markets and Prices	0.38	0.47	0.52	0.59	6
Theories of the Firm	0.32	0.44	0.47	0.56	9
Factor Markets	0.42	0.46	0.52	0.56	3
The Role of Government	0.41	0.40	0.52	0.59	7
International Economics	0.51	0.64	0.61	0.58	3

Correct Answers by Area

	For Comparison	Freshman Entry		Transfer	
	Econ 1	Econ 10A	Econ UD	Econ 10A	Econ UD
Basic	0.57	0.58	0.67	0.43	0.59
Markets and Prices	0.47	0.58	0.62	0.46	0.58
Theories of the Firm	0.44	0.49	0.58	0.45	0.53
Factor Markets	0.46	0.55	0.58	0.47	0.51
The Role of Government	0.40	0.56	0.68	0.47	0.56
International Economics	0.64	0.68	0.61	0.53	0.50

2014-15 Assessment Grants

- Chemical Engineering: Follow up on 2013-14 grant
- Mechanical Engineering/Chemical Engineering: Ethics in engineering curriculum
- GE Area C: Assessment of students' perceptions of courses and their usefulness
- History: Assessment of graduate perceptions of SLOs
- Political Science: Follow up on 2013-14 grant
- Sociology: Defining 'critical thinking'

Upcoming Assessment Council Events

Creating a Climate of Responsiveness for Learning and Writing: Better Learning Through Better Feedback

Dr. Chris Thaiss, Clark Kerr Presidential Chair and Professor, Writing Program, UC Davis

Friday, May 30, 2pm (with reception to follow)

Loma Pelona Center

Thank You

John Yun
Sue McLeod
Dorota Dutsch
Barbara Gilkes
Martie Roberts
Susan Derwin
Diane Mackie
Gene Lucas
Alicia Cast
Stefania Tutino
Colin Gardner
Carol Houchens
Craig Cotich
Doug Bradley
Matthew Potoski
Jennifer Johnson
Kevin Falvey
Eliza McEmrys
Bruce Tiffney
Daniel Pecchenino
Rod C. Alferness
Amber Vanderwarker
Adrienne Edgar
Linda Adler-Kassner
Doug Steigerwald
Lupe Navarro-Garcia
Randi Browning
Stephanie LeMenager
Christopher McAuley
Geoffrey Raymond
Petra Van Koppen
Gaye Johnson
Jeffrey Hanson
Kathy Patterson
Aaron Ettenberg
Patrick McHugh
Kum-Kum Bhavnani
Nicholas Tingle
Carol Lansing
Peter Mage
John S.W. Park
Kelly Bedard
Laury Oaks
Hyung Pai
Diane Fujino
James Donelan
Mary Nisbet
Carol Genetti
Risa Brainin
Susannah Porter
Tania Israel
John Latto
Jan Frodeson
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Chuck Wolfe
Claudio Fogu
Glenn Beltz
Jean Shultz
Gale Morrison
John Soboslai
Laurel Wilder
Chela Sandoval
Janet Walker
Shane Jimerson
John Mohr
Meta Clow
John Sutton
Ryan Boyd
Mary Jacob
Greg Ashby
Leslie Hammer
Libe Washburn
Deborah Karoff
Robert Samuels
Lisa Przekop
Chris Ograin
Craig Carlson
Michael Berry
Francisco Herrera
Mary Hancock
Reginald Daniel
Jon R. Snyder
Tim Cooley
Mary Bucholtz
Leo Cabranes-Grant
Randy Bergstrom
Amanda Stansell
Douglas Thrower
Christian Villaseñor
Carlos Garcia-Cervera
Olivia Walling
Bryant Wieneke
Patricia M. Clancy
Swati Chattopadhyay
Mashey Bernstein
Christopher Dean
Dorothy Mullin
Charles A. Akemann
Phillip McCarty
Jorge Castillo
Jane Mulfinger
Allyn Fleming
Jane Conoley
Paul Spickard
John Melack
John Majewski
Sabine Frühstück
Ljiljana Coklin
Thomas Holden
Michael Petracca
Francis M. Dunn
Robert Williams
Andre Wyss
Jim Kearney
Karen Myers
Miriam Wattles
Pierre Wiltzius
Paul Berkowitz
Jon Ramsey
Dolly Mullin
Todd Lee
José Cabezón
Andrew Norris
John Lazarus
Katia McClain
Robert Geller
Jon Sonstelie
Stan Parsons
Bob Williams
Alex Simms
Stuart Smith
Walid Afifi
Jill Felber
Roy Vallis
Eric Prieto
Ingrid Banks
Michael Brown
Don Lubach
Tom Holden
Jennifer Holt
Cissy Ross
Terri Coleman
Raisa Feldman
Helen Couclelis
Steven Velasco
Bruce Robertson
Patricia Fumerton
Margie Weeks
Daryl Cooper
Edward English
Darby Feldwinn
Katherine Saltzman-Li
Gina Genova
Gabriela Soto Laveaga
Katharine Saltzman-Li
Myriam Gonzalez-Smith
Shannon Brennan
Rick Church
Myriam Gonzales-Smith
Madeleine Sorapure
Laura Marques-Pascual
Daniel Wuebben
Jorge Luis Castillo
Leila Rupp
Deborah Harris-Moore
Constance Penley
Barbara Holdrege
John Lee
Mary Macrae
Toby Lazarowitz
Rolf Christoffersen
Philip McCarty
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Silvia Bermúdez
Susannah Scott
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Rudy Busto
Lisa Jacobson
Kenneth Rose
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Omer Blaes
Peter Huk
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Sarah Hirsch
Janet Mizrahi
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Gina Vallis
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Thomas Even
Bruce Kendall
Aashish Mehta
Karen Lunsford
Caren Converse
Jon McCammond
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Ralph Gallucci
Katie Baillargeon
Carole Paul
Mike Joiner
Kathy Foltz
Francis Dutra
Katherine Morales
Cynthia Brown
Darby Feldwin
Elisabeth Weber
Shasta Delp
Bob Ngo
Christopher Pilafian
Maria Mahoney
David Lopez-Carr
Lynn Gamble
Bob Kennedy
Dar Roberts
Dan Montello
Andy Satomi
Sara Lindheim
Auli Ek
Erika Rappaport
Brice Erickson