

Patty A. Kreikemeier  
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## Academic Background

Educational Administration Credential, National University.  
Teaching Credential, San Diego State University. (Life Science, Chemistry)  
M.S. University of Cincinnati. (emphasis in Developmental Biology/Biochemistry)  
B. S. Zoology, Colorado State University. (magna cum laude, emphasis in Zoology)

## Professional Experience

### Independent Consultant: 1994 – present.

Develop science curriculum, assessment and standards: Long Beach School District, Fresno School District; Alaska; California; Georgia; Kentucky; Louisiana; Rhode Island; South Carolina; Utah; Washington; A.C.T.; Action Learning Systems; Council of Chief State Science Officers; Delta Education; Educational Data Systems Inc.; Learning Mate; Measured Progress; Mometrix; Northwest Evaluation Association; Pearson; Prometric, Sapling Learning; Symmetry; Victory Productions.

### Assessment Director Center for Research, Evaluation and Assessment 2007 – 2009.

Lawrence Hall of Science at The University of California, Berkeley.

Prepare proposals, budgets, timelines; develop assessment blueprints, assessment instruments and scoring protocols; supervise scoring team of Ph.D.-level colleagues, undergraduate and graduate students, K-12 classroom teachers and administrators, and community college consultants; data analysis using Item Response Theory (IRT) for curriculum and professional development projects, including the following National Science Foundation (NSF) funded projects:

*Seeds of Science, Roots of Reading* – an elementary school curriculum that integrates inquiry science with content-rich literacy instruction for students grades 3-6

*Science and Global Issues* – a high school science curriculum that addresses the role of science in the needs of modern society and the use of technology in advancing scientific knowledge

*Assessing Science Knowledge* – a Research and Development project of the Full Option Science System (FOSS) curriculum

*Youth and the Ocean (iYO!)*, an Ocean Science Outreach program for underserved populations of students in grades 6-8 and their teachers

Prepare evaluation reports for internal and external Lawrence Hall of Science clients, including:

Final report for National Science Foundation-funded *Center for Ocean Science Education Excellence* (COSEE): a six year, multi-organization “Collaborative Research” effort

Institutional representative

Attend meetings of the Strategic Education Research Partnership (SERP) working with the San Francisco Unified School District (SFUSD).

### Educational Researcher 2000 – 2007.

Center for Technology in Learning, SRI International, Menlo Park, California.

Co-Principal Investigator for National Science Foundation-funded projects; preparation of proposals, budgets, timelines; project leadership, task management for evaluation, assessment and technology projects:

#### Assessment projects:

*Intel Assessments* - develop assessment blueprint; develop multiple choice assessment instruments and scoring protocols; write reports.

*Riverside Publishing– Minnesota Assessment* - develop assessment blueprints; develop scenario-based assessment instruments; write reports.

*Information and Communication Technology(ICT)-Based Performance Assessments* - project manager; develop assessment instruments and scoring protocols; supervise scoring team; website development manager (<http://ipat.sri.com/>); write reports; disseminate project at National and International meeting.

*Validities of Standards-based Science Inquiry Assessments: Design & Implementation Studies* – lead the Alignment of the project; develop inquiry codes based on National Science Education Standards (NSES) Inquiry Standards; lead alignment advisory team (national-level experts and internal personnel); data analysis; write reports; disseminate project at National meetings.

*Math-Science Partnerships – Assessment Resources Management System (MSP-ARMS): a Research, Evaluation and Technical Assistance Design Study* - project manager; develop instrument to evaluate Partnership assessment needs; write reports; disseminate project at National meeting.

#### Research and Development Projects:

*Professional Development Decisions using Data (PD<sup>3</sup>)* - develop handheld technology delivery system for the evaluation of teacher content knowledge and classroom practices; develop training manual and train 100+ administrators throughout Florida.

*Transforming Instruction by Design in Earth Science (TIDES)* – develop instruments for assessment of middle school teacher pedagogical content knowledge, and middle school student content knowledge; write reports; disseminate project at National meeting.

*Technology-Enhanced Elementary and Middle School Science (TEEMSS II)* - co-Principal Investigator; develop assessment instruments and scoring protocols to measure elementary and middle school student content knowledge of technology-enhanced curriculum; report writing.

*Performance Assessment Links in Science / Performance Assessment Links in Math* ([www.PALS.sri.com](http://www.PALS.sri.com) and [www.PALM.sri.com](http://www.PALM.sri.com)) - project manager for math supplement including math alignment and website development; budget manager for project-to-close phase of project; write reports; disseminate project at National meeting.

*Global Observations to Benefit the Environment (GLOBE) Classroom Performance Assessments* - assessment manager; develop assessment templates; develop and field test classroom assessments; manager the alignment of GLOBE protocols, classroom activities and assessments to state standards; develop alignment manual for Texas teachers; develop alignment protocols for state level participants; disseminate project at State and National meeting.

*ChemSense (A Visualization and Animation Tool for the Chemistry Classroom)* - develop curriculum templates; recruit and manage work of teacher consultants; disseminate project at National meetings.

#### Evaluation projects:

*California Subject Matter Project Evaluation* - content lead for science field observations.

*Online Evaluation Resource Library (OERL)* - review, classify and recommend evaluation reports.

*Review of the Washington Assessment of Student Learning (WASL) in Mathematics: Grades 7 & 10* - develop alignment instruments; lead alignment advisory team (national- and state-level experts); data analysis; write reports; disseminate project at National meetings.

*Transforming Instruction by Design in Earth Science (TIDES)* – develop assessment instruments to measure student content knowledge; develop assessment instruments to measure teacher pedagogical content knowledge; facilitate discussions between content area subject matter experts and researchers; develop rubrics for scoring teacher-assignment-student-work research; write reports; disseminate project at National meetings.

*Technology-Enhanced Elementary and Middle School Science II (TEEMSS II)* - contribute to annual report writing.

*Visualizations in Teaching Chemistry (ChemViz)* - project manager; develop evaluation instruments; field observations; write reports; coordinate completion of final report.

University of California, Office of the President: 1997- 2000.

New Standards Science Reference Exam Development Manager - design and develop standards-based science reference examinations including field testing, scoring protocols, supervise scoring team; disseminate project at state, regional and national meeting.

Project Achieve –develop criteria for alignment of state exams to state standards.

National Center on Education and The Economy (NCEE): 1997-2000.

National Alliance for Restructuring in Education (NARE) – develop curriculum for Programs of Study for Chicago Public Schools (Environmental Sciences, Biology, Earth/Space Sciences, Chemistry, Physics); develop test blueprint for end-of-course exams.

Jesup High School, Jesup, Iowa: 1996-1997.

Principal - Coordinate activities, attendance, discipline, guidance, scheduling and teaching assignments for 300 students (grade 9-12) within a 1000 student K - 12 rural district. Lead district Standards and Benchmarks development teams (Science and Social Science).

California Golden State Exam Development Team: 1992 – 1995.

Content area team leader - develop tests for Biology, Chemistry and Coordinated Science exams; score and train content area leader; disseminate work at local, regional and state meetings.

High School Science Teacher, Grossmont Union High School District: 1984 – 1996.

Teacher - teach Biology, Chemistry, Coordinated Science, Physics, Earth Science and Physical Science; disseminate work at local, regional and state meetings.

Member of full-inclusion team for Severely Handicapped Students – prepare classroom and students for inclusion of severely-handicapped student; work with special education teacher to modify lesson activities and assessments for full inclusion students; disseminate project at national meetings.

District mentor teacher – assessment liaison with California State Department of Education; plan and host monthly meetings with district teachers; disseminate project at state and local meetings.

Home-school science teacher - develop stand alone science curriculum suitable for use by a home schooled students grades 9-12; assess student progress.

**Outreach and Teacher Professional Development**

*Workshops and Conference Papers have been presented for the following groups:*

American Educational Research Association

American Geophysical Union

Bethlehem, PA School District Science Teachers & Administrators

California Association of Chemistry Teachers

California Scope, Sequence and Coordination Summer Workshops

Center for the Assessment and Evaluation of Student Learning (CAESL)

Chula Vista, CA Jr. High Science Department

Colorado Coalition for Inclusive Education

Global Laboratory Observations to Benefit the Environment (GLOBE) annual conference

Grossmont Union High School District, CA Summer Institute

International Organization for Science and Technology Educators  
Midwest Chapter of American Chemical Association, meeting held at Kansas State University  
National Association for Research in Science Teaching  
National Center on Education and the Economy Annual Conference  
National Council on Measurement in Education  
National Science Teachers Association  
San Diego, CA Administrators Association  
San Diego County, CA Office of Education, Academic Excellence Preparation Program  
San Diego County, CA Office of Education, Academic Curriculum Supervisors Training Program  
San Diego County, CA Office of Education, Academic Middle School Science Teachers  
Assessment Project  
San Diego County, CA Office of Education, Academic Small Districts Curriculum Conference  
San Diego, CA Engineers and Manufacturers Roundtable  
San Diego, CA Science Educators Association Conference  
Santee, CA School District Elementary Science Teachers Weekend Retreats  
Texas Science Teachers Annual Summit  
University of California, San Diego - Middle School Science Teachers Institute

*Topics have included:*

A Successful School - Business Collaboration: The San Diego County Industry Fellows Program  
Aligning GLOBE Curriculum to Texas Essential Knowledge and Skills (TEKS).  
Alignment of Large-Scale National And International Tests With National Science Education  
Standards  
Alternative Assessment Strategies  
Assessing Teachers' Comprehension of Curricular Purposes  
Authentic Assessment Practices  
California Science Framework  
Chemistry and Physics for Elementary Students  
Chemistry and Physics for Middle School Students  
Chemistry and Physics of the Environment  
ChemSense: A Knowledge Building Environment for Chemistry Students  
Cross Curricular Approach to Nuclear Age Education  
Curriculum Modification and Inclusive Strategies for ALL Students  
Developing Curriculum Embedded Assessment Vehicles  
Inclusion of Severely Handicapped Students in The Science Classroom  
Information and Communications Technology Assessments for the 21st Century  
Mapping Standards to Big Ideas  
Nanoscience and the High School Chemistry Students  
New Standards Science Reference Exam  
Performance Assessment Links in Math (PALM)  
Performance Assessment Links in Science (PALS)  
Structure and Use of Science Portfolios in the 9-12 Classroom.  
Tools to Align Standards and Assessment  
Using Computers in the Chemistry Classroom  
Using Statewide Assessment Procedures as Curriculum Tools

## Publications

- Michalchik, V., Rosenquist, A., Kozma, R., Kreikemeier, P., & Schank, P. (2008). Representational resources for constructing shared understandings in the high school chemistry classroom. In J. Gilbert, M. Nakhleh, & M. Reiner (Eds.). *Visualization: Theory and practice in science education (Models and Modeling in Science Education)*. New York: Springer.
- Penuel, W. R., Kreikemeier, P. A., & Venezky, D. (2006). *Mapping Standards to Big Ideas: A Task for Assessing Teachers' Comprehension of Curricular Purposes in Earth Science*. American Geophysical Union, Annual Meeting, San Francisco, 2006.
- Kreikemeier, P. A., Gallagher, L., Penuel, W. R., Fujii, R., Wheaton, V., & Bakia, M. (2006). *Technology-Enhanced Elementary and Middle School Science II (TEEMSS II): Research Report 1*. Menlo Park, CA: SRI International.
- Quellmalz, E. & Kreikemeier, P.A. (2004). *Designing Assessments of Learning with Technology*. Paper presented at American Educational Research Association Symposium, San Diego, 2004.
- Kreikemeier, P. A., Quellmalz, E., Haydel, A. M. (2004). *Testing the Alignment of Items to the National Science Education Inquiry Standards*. Paper presented at American Educational Research Association Symposium, San Diego, 2004.
- Ryan, J.M., Quellmalz, E., Kreikemeier, P.A., & Haertel, G. D. (2004). *Testing the Alignment of a State's Mathematics Tests to Standards and Grade-Level Expectations*. Paper presented at American Educational Research Association Symposium, San Diego, 2004.
- Quellmalz, E., Kreikemeier, P.A., & Haydel, A. M. (2004). *Supporting Evidence-Based Claims About Student Achievement with an Assessment Resource Management System*. Paper presented at American Educational Research Association Symposium, San Diego, 2004.
- Kreikemeier, P., & Quellmalz, E. (2003). *Alignment of NAEP, TIMSS and New Standards Science Items with the NSES Inquiry Standards*. Paper presented at American Educational Research Association Symposium, Chicago, 2003.
- Quellmalz, E., Kozma, R., & Kreikemeier, P. (2003). *Development of an ICT Assessment Framework for The 21st Century*. Paper presented at 2003 North American International Organization for Science and Technology Educators Symposium, Williamsburg, VA.
- Quellmalz, E., Kozma, R., & Kreikemeier, P. (2003). *Development of ICT Performance Assessments for The 21st Century*. Paper presented at 2003 North American International Organization for Science and Technology Educators Symposium, Williamsburg, VA.
- Kreikemeier, P. & Hammon, B. (2003). *ChemSense: A Knowledge Building Environment for Chemistry Students*. Paper presented at 2003 National Science Teachers Association Convention, Philadelphia, PA.
- Kreikemeier, P. (2003). *ChemSense: A Knowledge Building Environment for Chemistry Students*. Paper presented at 2003 National Association for Research in Science Teaching, Philadelphia, PA. 2003.
- Kreikemeier, P., & Quellmalz, E. (2002). *Aligning GLOBE to Texas Essential Knowledge and Skills (TEKS)*. Paper presented at 4th Annual Texas Science Summit, San Antonio, TX.
- Quellmalz, E., Kreikemeier, P. (2002). *The Alignment of Standards and Assessment: Building Better Methodologies - Validities of Science Inquiry Assessments: A Study of the Alignment of Items and Tasks Drawn from Science Reference Exams with the National Science Education Standards*. Paper presented at American Educational Research Association Symposium, New Orleans, 2002.
- Quellmalz, E., Kreikemeier, P., and Rosenquist, A. (2002). *Teacher Supports and Strategies for Enacting an Inquiry-Based Science Program - Alignment Tools for Indexing GLOBE to State Science Standards*. Paper presented at American Educational Research Association Symposium, New Orleans, 2002.

Michalchik, V., Schank, P., Rosenquist, A., Kreikemeier, P., & Kozma, R. (2002). Visual Representations in the Collaborative Learning of Chemistry. Paper presented at American Educational Research Association Symposium, New Orleans, 2002.

Quellmalz, E., Kreikemeier, P., Rosenquist, A., & Hinojosa, T. (2001). Aligning GLOBE to National and International Standards. Paper presented at the Sixth Annual GLOBE Conference, Blaine, WA.

Quellmalz, E., Haertel, G., Kreikemeier, P., Haydel, A., Jones, J.A., & Trevisan, M. (2001). How Well Do Large-Scale Reference Examinations Measure Science Inquiry? Perspectives from a Multimethod Validity Investigation. Paper presented at American Educational Research Association Symposium, 2001.

Jones J.A., Trevisan, M., Kreikemeier, P., Haydel, A., Haertel, G., & Ryan, P. (2001). Examining Inferences About Science Inquiry Assessments: A New Look at NAEP, TIMSS and New Standards. Paper presented at National Council on Measurement in Education Symposium, 2001.

Martin, M., Kreikemeier, P., Blank, R., & Gromko, M. (1999). Aligning Standards, Practice & Assessment - The Key to Coherent, Long-lasting Science Reform. Paper presented at National Association for Research in Science Teaching Conference Proceedings 1999.

Fisher, D., Sax, C., Pumpian, I., Rodifer, K., & Kreikemeier, P. (1997). Including All Students in the High School Reform Agenda. *Education and Treatment of Children*; v20 n1, p59-67.

Kreikemeier, P., (1993). A Teacher's Perspective on Portfolios - It's a Keeper. *California Science Teachers Journal*, Nov. 1993.

Martin, M., Fujii, K., Sabbadini, P., & Kreikemeier, P. (1990). *Academic Excellence -A Preparation Guide to Golden State Examination*, San Diego, CA: San Diego County Office of Education

Kreikemeier, P. & Wert, C. (1986). *Clear and Simple Biology*. New York, New York: Prentice Hall Press.