

JOSHUA P. GUTWILL

Exploratorium
3601 Lyon Street
San Francisco, CA 94123
(415) 353-0408

joshuag@exploratorium.edu

EDUCATION

Ph.D., Education in Math, Science & Technology, U.C. Berkeley, 1996
Dissertation: Coordinated causal model design: Building on linked conceptual primitives

M.A., Education in Math, Science & Technology, U.C. Berkeley, 1992
Thesis: Looking for the causal connection: High school students' reasoning about simple electric circuits

B.A., Physics and History, *summa cum laude*, Clark University, 1990

RESEARCH & EVALUATION EXPERIENCE

Acting Director of Visitor Research, Exploratorium, San Francisco, CA 6/08 – present

Visitor Research and Evaluation Department

- Direct department of seven regular staff and over ten on-call staff.
- Oversee Exploratorium visitor research and evaluation activity.

Group Inquiry by Visitors at Exhibits (GIVE) project

- Principal Investigator responsible for all aspects of the project, including analysis of data, and publication and dissemination of results.

Geometry Playground Project

- As co-PI for research, supervise visitor research and evaluation endeavors for the project.

Project Director, Exploratorium, San Francisco, CA 1/07 – 9/08

Geometry Playground Project

- Director and Co-Principal Investigator for the Geometry Playground project. Responsible for all aspects of the project, including development of exhibition, website, playground activities, and affiliated school curriculum, as well as research and evaluation.

Senior Researcher, Exploratorium, San Francisco, CA 9/98 - present

Museum Visitor Research & Exhibit Evaluation

- Supervising and mentoring Research Coordinators and Evaluation Assistants.
- Co-implementing research studies for the Group Inquiry by Visitors at Exhibits project.
- As co-Principal Investigator, directed an NSF-funded project entitled, "Going APE: Achieving Active Prolonged Engagement with Interactive Science Museum Exhibits." Oversaw all research and evaluation aspects of the project.
- Conducted evaluation and research studies for other projects within the Center for Public Exhibition, including Group Inquiry by Visitors at Exhibits, Nanoscale Science, Finding Significance, Seeing, Audio Tour and Revealing Bodies. Publishing and presenting the studies.
- Designed and launched a five-year longitudinal study to investigate the effects of the museum's Explainer Program on the lives of explainers.

Director of Assessment & Evaluation, Chemistry Dept., U.C., Berkeley, CA

7/96 – 6/00

Modular Chemistry Consortium Project

- Directed the assessment and evaluation effort for a five-year, Systemic Change Initiative project, funded by the NSF to improve undergraduate chemistry curricula.
- Collaborated with faculty from 17 colleges and universities.
- Supervised seven assistants, including two post-doctoral chemists.

General Electric Faculty Fellows Program — Knowledge Retention Study

- Designed and implemented “Carry-Forward” experiments with faculty to track students’ knowledge retention as they moved from one course to the next.

General Electric Faculty Fellows Program — Interdisciplinary Assessment Project

- Coordinated campus-wide assessment efforts with evaluators from the Physics and Engineering Departments.

Evaluation Consultant, Berkeley, CA

9/97 - Present

Community Resources for Science

- As Vice-President of the Board of Directors, currently overseeing the annual evaluation for this non-profit organization.

Cabrillo College C4 Project

- Advised in the evaluation of a web-based, multimedia-intensive chemistry course.

Illinois-Wesleyan University Integrated Chemistry Project

- Advised their evaluator on strategy, design and analysis.

Graduate Researcher, Education in Math, Science & Technology, U.C., Berkeley, CA

9/94 - 5/96

Doctoral Dissertation Project

- Developed and implemented a study with 60 high school student participants in four treatment groups to explore how they make sense of multiple models of a single phenomenon — electricity.
- Designed inquiry-based curricular materials, computer animations, and assessments.

Senior Research Assistant, Educational Testing Service, Oakland, CA

9/90 - 5/96

ThinkerTools II Project

- Co-revised a computer-based, middle school curriculum on force and motion.
- Co-designed ThinkerTools II software package on force and motion.
- Co-facilitated a summer workshop for teachers to create curriculum materials.
- Designed and implemented assessments for both teachers and students.

Qualitative Understanding of Electrical Systems Project

- Conducted a study involving fifty high school student participants to investigate how computer simulations can help students build mental models of electric circuits.

TEACHING EXPERIENCE

- Guest Lecturer**, Graduate School of Education, U.C. Berkeley, CA 9/11/95
- Presented "Videotaping: Pointers and Pitfalls" to a graduate level Qualitative Methodology class.
- Instructor**, Graduate School of Education, U.C. Berkeley, CA 1/93-5/93
- Co-designed and co-taught a graduate seminar entitled Metaphors in Math and Science Education.
- Teaching Assistant**, Physics Dept., El Cerrito High School, El Cerrito, CA 9/92-6/93
- Assisted the teacher during physics laboratory classes.
 - Held tutoring sessions for the physics students.
- Writing Assistant**, Environment, Technol. & Society Dept., Clark U., Worcester, MA 1/89-5/89
- Developed and implemented writing workshops for college students enrolled in The Nuclear Age course.
- Teaching Assistant**, Physics Dept., Clark U., Worcester, MA 1/88-5/88
- Conducted problem-solving help sessions for students enrolled in Introductory Physics 110.
 - Graded homework and tests for the instructor.

PUBLICATIONS

- Allen, S. and J. Gutwill (in submission). Creating a "crash course" in inquiry at a hands-on science museum. Curator.
- Gutwill, J. P. (2008). Challenging a common assumption of hands-on exhibits: How counter-intuitive phenomena can undermine open-endedness. Journal of Museum Education 33(2): 187-198.
- Allen, S., Gutwill, J., Perry, D., Garabay, C., Ellenbogen, K., Heimlich, J., et al. (2007). Research in Museums: Coping with Complexity. In J. Falk, L. Dierking & S. Foutz (Eds.), In Principle, In Practice: Museums as Learning Institutions (pp. 229-246). New York: Rowman & Littlefield Publishers, Inc.
- Gutwill, J. P. (2006). Labels for open-ended exhibits: Using questions and suggestions to motivate physical activity. Visitor Studies Today 9(1): 1-9.
- Gutwill, J., and Thogersen, E. (2005). Initial and Prolonged Engagement: Resolving the Tensions. ASTC Dimensions.
- Humphrey, T., & Gutwill, J. P. (2005). Fostering Active Prolonged Engagement: The Art of Creating APE Exhibits. Left Coast Press: Walnut Creek.
- Allen, S. and J. Gutwill (2004). Designing science museum exhibits with multiple interactive features: five common pitfalls. Curator 47(2): 199-212.
- Gutwill, J. (2003). Gaining visitor consent for research II: Improving the posted-sign method. Curator, 46(2), 228-235.
- Gutwill, J. (2002). Gaining visitor consent for research: Testing the posted-sign method. Curator, 45(3), 232-238.
- Gutwill, J. (2003). A review of the *Risk!* Exhibition at the Fort Worth Museum of Science and History. Curator, 45(3), 239-243.

PUBLICATIONS (continued)

- Gutwill, J. (2002). A review of the Museum Learning Collaborative website. Visitor Studies Today, 5(2), 16-17.
- Gutwill-Wise, J., & Allen, S. (2002). Finding significance: Testing methods for encouraging meaning-making in a science museum. Current Trends in Audience Research and Evaluation, 15, 5-11.
- Gutwill-Wise, J. (2001). The impact of active and context-based learning in introductory chemistry courses: An early evaluation of the Modular approach. Journal of Chemical Education, 78(5), 684-690.
- Gutwill, J., Frederiksen, J., & White, B. (1999). Making their own connections: Students' understanding of multiple models in basic electricity. Cognition and Instruction, 17(3), 249-282.
- Frederiksen, J. R., White, B. Y., & Gutwill, J. (1999). Dynamic mental models in learning science: The importance of constructing derivational linkages among models. Journal of Research in Science Teaching, 36(7), 806-836.
- Anthony, S., Gutwill, J., Kegley, S., Mernitz, H., Molinaro, M., & Spencer, B. (1998). The ChemLinks and ModularChem Consortia: Using active and context-based learning to teach students how chemistry is actually done. Journal of Chemical Education, 75(3), 322-324.
- Kegley, S., Stacy, A., & Gutwill, J. (1996). Environmental chemistry in the general chemistry laboratory, part II: Evaluation of an alternative curriculum. The Chemical Educator, 1(2).
- Gutwill, J., Frederiksen, J., & Ranney, M. (1996). Seeking the causal connection in electricity: Shifting among mechanistic perspectives. International Journal of Science Education, 18(2).
- Chiu, M. M. & Gutwill, J. (1994). The architecture of intuition: Converging views from physics education and linguistics. In A. Ram & K. Eiselt (Eds.), Proceedings of the Sixteenth Annual Conference of the Cognitive Science Society, 16 (pp. 183-188). Georgia Institute of Technology, Atlanta, Georgia: Lawrence Erlbaum Associates.

PRESENTATIONS

- Gutwill, J. (2009). The Exploratorium's Visitor Research and Evaluation Department: Focusing on Group Inquiry. Presentation to the Explainer Manager's Workshop for the ExNet Museum Consortium.
- Gutwill, J. (2008). Instrumenting Chaos: Understanding the Visitor Experience in a Free-Choice Environment. Presentation at the UX Week Adaptive Path conference. San Francisco, CA.
- Gutwill, J. (2008). Ethical and Practical Solutions for Evaluation Studies: Protecting Human Subjects. Workshop presentation at the National Science Foundation's PI Summit. Washington, D.C.
- Gutwill, J. (2008). Geometry Playground: Creating and Studying an Immersive Exhibition. Poster presented at the National Science Foundation's PI Summit. Washington, D.C.
- Gutwill, J. (2007). Measuring Play in the Going APE project. Presentation at the Western Museums Association conference. Oakland, CA.
- Gutwill, J. and Allen, S. (2007). Fostering Group Inquiry at Science Museum Exhibits. Presentation at the Visitor Studies Association conference. Ottawa, Canada.
- Gutwill, J. (2006). Promoting Inquiry at Exploratorium Exhibits. Presentation to the staff of the Bay Area Discovery Museum. San Francisco, CA.
- Gutwill, J. (2006). Teaching Inquiry Skills in Museums. Presentation to the Board of Directors for Community Resources for Science. Berkeley, CA.

PRESENTATIONS (continued)

- Gutwill, J., Humphrey, T., Sowers, C., Thogersen, E. (2005). Fostering Active Prolonged Engagement: The Art of Creating APE Exhibits. Presentation to the Learning and Teaching Science course at the University of California, Berkeley.
- Gutwill, J. (2005). Fostering Active Prolonged Engagement: The Art of Creating APE Exhibits. Presentation to the Learning and Teaching Science course at the University of California, Berkeley.
- Gutwill, J. and Hido, N. (2005). Studying visitors' Active Prolonged Engagement at science museum exhibits: Final results from the Going APE project. Presentation at the Visitor Studies Association conference. Philadelphia, PA.
- Gutwill, J. and Thogersen, E. (2004). Assessing visitor behavior at Exploratorium exhibits. Workshop presentation to members of the Center for Museum Partnerships. San Francisco, CA.
- Gutwill, J. (2004). Visitors' behavior at exhibits designed to promote Active Prolonged Engagement. Presentation to members of the Going APE Workshop. San Francisco, CA.
- Burk, D., Dimond, E., Gutwill, J., Humphrey, T., Perlov, D., and Perry, D. (2004). Building exhibits to encourage Active, Prolonged Engagement in science centers. Presentation to the Association of Science and Technology Centers. San Jose, CA.
- Allen, S., Falk, J., Gutwill, J., and West, R. (2004). Recent research on museum interactives. Presentation to the Association of Science and Technology Centers. San Jose, CA.
- Gutwill, J. and Thogersen, E. (2004). Visitor behavior at the Floating Objects exhibit: Using videotape in formative evaluation. Workshop presentation to members of the Center for Museum Partnerships. San Francisco, CA.
- Gutwill, J. (2004). The Going APE Project: Achieving prolonged engagement in museum visitors. Presentation to the UC Santa Cruz School of Education. Santa Cruz, CA.
- Allen, S. and Gutwill, J. (2003). Studying exhibits that intrigue, engage and inform: Research and evaluation at the Exploratorium. Presentation to the UC Berkeley School of Education. Berkeley, CA.
- Gutwill, J. (session organizer), Bell, L., Newlin, J., and Whitmore, D. (2002). Building exhibits to change visitor behavior: The nuts and bolts of promoting extended inquiry. Presentation to the Association of Science and Technology Centers. Charlotte, NC.
- Allen, S., Gutwill, J., Koterwas, T., and McLean, K. (2002). Studying Visitor Meaning-Making at Exhibits. Presentation to the Association of Science and Technology Centers. Charlotte, NC.
- Gutwill, J. (2002). Audio/ videotaping museum visitors: Methods for obtaining informed consent. Roundtable presentation at the Visitor Studies Association conference. Cody, WY.
- Allen, S. and Gutwill, J. (2002). Improving Your Skills at Phrasing Questions. Workshop at the Visitor Studies Association conference. Cody, WY.
- Gutwill-Wise, J. (2002). Finding Significance: Testing methods for encouraging meaning-making in a science museum. Poster presentation to the American Association of Museums. Dallas, TX.
- Gutwill-Wise, J. (2002). The exhibit development process (and other horror stories): The evaluator's role in the exhibit development process. Marketplace of Ideas presentation to the American Association of Museums. Dallas, TX.
- Allen, S., Gutwill-Wise, J., and Garcia-Luis, V. (2001). Improving Your Skills at Phrasing Questions. Workshop at the Visitor Studies Association conference. Orlando, FL.

PRESENTATIONS (continued)

- Gutwill-Wise, J. (2001). Cases in Progress: Using Videotape to Assess Active Prolonged Engagement. Roundtable presentation at the Visitor Studies Association conference. Orlando, FL.
- Gutwill-Wise, J. (2001). Ethical Dilemmas: Videotaping Visitors for Research Purposes. Roundtable presentation at the Visitor Studies Association conference. Orlando, FL.
- Allen, S., Gutwill-Wise, J., and Garcia-Luis, V. (2000). Improving Your Skills at Phrasing Questions. Workshop at the Visitor Studies Association conference. Boston, MA.
- Thogerson, E. & Gutwill, J. (2000). Designing for Self-Directed Visitor Experiences. Presentation to the Association of Science and Technology Centers. Cleveland, OH.
- Gutwill, J. (2000). Using real-world contexts and active learning: Do students fare any better? Presentation to the American Chemical Society. San Francisco, CA.
- Gutwill, J. & Seymour, E. (2000). ModularChem and ChemLinks Annual Evaluation Report. Presentation to the ChemLinks National Visiting Committee. San Francisco, CA.
- Gutwill, J. & Seymour, E. (2000). ModularChem and ChemLinks Annual Evaluation Report. Presentation to the ModularChemistry National Visiting Committee. Berkeley, CA.
- Gutwill, J. (1999). A Progress Evaluation of the Modular Approach. Presentation to the American Chemical Society. New Orleans, LA.
- Gutwill, J. & Seymour, E. (1999). ModularChem and ChemLinks Annual Evaluation Report. Presentation to the ChemLinks National Visiting Committee. Chicago, IL.
- Gutwill, J. & Seymour, E. (1999). ModularChem and ChemLinks Annual Evaluation Report. Presentation to the ModularChemistry National Visiting Committee. Berkeley, CA.
- Gutwill, J. (1998). Finding out what's important: How to evaluate educational programs in meaningful ways. Presentation at the Chemistry Department Seminar. University of Arizona, Tucson, AZ.
- Gutwill, J. (1998). What lessons have we learned about the modular approach? Presentation at the ModularChem Consortium's Workshop on Innovative Instruction in Chemistry. Berkeley, CA.
- Gutwill, J. & Molinaro, M. (1998). Assessing long-term knowledge retention across disciplines. Presentation to the General Electric Faculty Fellows. Berkeley, CA. (Co-presented by Gutwill & Molinaro.)
- Gutwill, J., Lewis, E., & Seymour, E. (1998). Making it count: How to evaluate educational reform efforts meaningfully. Workshop presentation at NSF's Shaping the Future Conference. Lincoln, NE.
- Gutwill, J. & Seymour, E. (1998). ModularChem and ChemLinks Annual Evaluation Report. Presentation to the ChemLinks National Visiting Committee. Manhattan Beach, CA.
- Gutwill, J. & Seymour, E. (1998). ModularChem and ChemLinks Annual Evaluation Report. Presentation to the ModularChemistry National Visiting Committee. Berkeley, CA.
- Gutwill, J. & Spencer, B. (1998). ChemLinks and ModularChem: Real world applications and active pedagogy in chemistry learning. Presentation to the Gordon Research Conference: Innovations in College Chemistry Teaching. Ventura, CA. (Co-presented by Gutwill & Spencer.)
- Gutwill, J. & Spencer, B. (1998). Cognitive and attitudinal change in a ModularChem/ChemLinks modular chemistry course at the post-secondary level. Presentation to the American Chemical Society. Dallas, TX. (Co-presented by Gutwill & Spencer.)
- Gutwill, J. & Seymour, E. (1997). Connecting to students: The first steps in thinking about evaluation. Workshop presentation at the Project Kaleidoscope Chemistry Workshop. Colorado Springs, CO.

PRESENTATIONS (continued)

- Gutwill, J. & Seymour, E. (1997). ModularChemistry and ChemLinks Joint Project Evaluation Report. Presentation to the ModularChemistry National Visiting Committee. Berkeley, CA.
- Gutwill, J., Lewis, E., & Seymour, E. (1997). ModularChemistry and ChemLinks Joint Project Evaluation Report. Presentation to the ChemLinks National Visiting Committee. Des Plaines, IL.
- Gutwill, J., Seymour, E., & Lewis, E. (1997). Methods for evaluating a large-scale reform project: A focus on students' attitudes and scientific thinking skills. Presentation to the American Chemical Society. San Francisco, CA.
- Gutwill, J., Seymour, E., Loeser, J., Lewis, E., & Boardman, J. (1997). Evaluating together—Undergraduate chemistry reform in two NSF consortia. Part 3: Measuring changes in students' understanding. Presentation to the American Chemical Society. San Francisco, CA.
- Gutwill, J. (1996). How students integrate multiple models: Assessing understanding of electricity. Presentation to the ModularChem Consortium, Department of Chemistry. Berkeley, CA.
- Gutwill, J., White, B., & Frederiksen, J. (1996). Linking topics in physics education: Multiple representations and mechanisms in basic electricity. Paper presented at the Annual Meeting of the American Educational Research Association. New York, NY.
- Moore, C.B. & Gutwill, J. (1996). Modular curriculum materials for introductory college chemistry. Presentation to the Global Summit on Science and Science Education, National Science Teachers Association. San Francisco, CA.
- Frederiksen, J., Gutwill, J., & White, B. (1995). Causal models of electric circuits: Overcoming student difficulties. Paper presented at the Annual Meeting of the American Educational Research Association. San Francisco, CA.
- Chiu, M. M. & Gutwill, J. (1994). The architecture of intuition: Converging views from physics education and linguistics. Paper presented at the Sixteenth Annual Meeting of the Cognitive Science Society. Atlanta, Georgia.
- Gutwill, J. (1993). Shifting mechanistic perspectives in electricity: Students' reasoning about simple circuits. Paper presented at the Winter Meeting of the American Association of Physics Teachers. New Orleans, LA.

PROFESSIONAL AFFILIATIONS

Visitor Studies Association	1999-present
American Association of Physics Teachers	1993-present
American Educational Research Association	1992-present

SERVICE

Member, IRB Task Force, Visitor Studies Association	2007-present
Vice President, Board of Directors, Community Resources for Science, Berkeley, CA	2000-2007

FELLOWSHIPS AND HONORS

General Electric Faculty Fellow, University of California, Berkeley, 1998-2000

U.C. Regents Fellowship, University of California, Berkeley, 1995

Corey Fellowship, University of California, Berkeley, 1994

Ruth M. Gleason Scholarship, University of California, Berkeley, 1993

Edgar and Camilla Morphet Fellowship, University of California, Berkeley, 1992

Newhouse Fund Grant for support of graduate research, Newhouse Foundation, 1991

Allen D. Wilson Scholarship, University of California, Berkeley, 1990

Phi Beta Kappa, Clark University, 1989