CV February, 2019

CONTACT INFORMATION
College of Information Studies
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University of Maryland
College Park, MD, USA 20742-1815
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EDUCATION

University of Michigan Ann Arbor, School of Education
Ph.D. (2008). Degree titled: *Learning Sciences: Materials, Measurement, & Information Architecture*.

Georgetown University
M.A. in Communication, Culture, & Technology (2003).

University of Maryland University College
B.S. Information Systems (2001), *magna cum laude*.

Dr. Philip Piety works at the intersection of education and information systems. He has authored articles and a book looking at how different communities consider the role of data and information in educational practice. His focus has recently been on the role of educational infrastructures and how infrastructures for instruction and for analytics are related and promise to provide opportunities to improve educational practice across the scale of systems.

He has broad professional experience with large organizational technology, including as a senior consultant and manager with Oracle and IBM. He has been a technologist from an early age and his consulting and professional work has spanned several industries, including health care, government, and education. His clients have included the Cisco Networking Academy, Pearson, and the Learning Analytics Workgroup funded by the Bill & Melinda Gates Foundation.

GRANTS AND FUNDING

Principal Investigator: Collaboration in the Future of Work: Developing Playable Case Studies to Improve STEM Career Pathways (National Science Foundation award 1915563). Total project: $1.87m, UMD award $1.1m. Partners at Brigham Young University and Indiana University.

Workshop Project Laura Bush 21st Century Librarian Program. Institute of Museum and Library Services (Award: RE-73-18-0105-18) $99K. Role, minor PI

iSchool Research Innovation Grant for the study of educational data use literature (2018) for $1300.00

EMPLOYMENT HISTORY

2017 – Present   **Senior Lecturer**

Full-time instructional faculty teaching across graduate and undergraduate programs, including:
- Programming for Information Science Majors (INST126)
- Teams, Management, and Organizations (INST335)
- Integrated Information Science Capstone
- Information Environments (INFM600)
- Information Architecture
- Seminar of Education Digital Infrastructures (INST728V)
- Achieving Organizational Excellence in Cultural Institutions (LBSC631)
- Creating Information Infrastructures (LBSC671)
- Database Design (INST733)

2015 – 2017   **Lecturer**

Full-time instructional faculty with the Decisions, Operations, and Information Technology (DOIT) at the Robert H Smith School of Business teaching:
- Agile Development (BUDT758-N)
- Business Process Analysis (BUDT758-N)
- Systems Requirements and Design (BMGT403)
- Introduction to Information Systems (BMGT301)
- Healthcare Informatics (BUDT758-M)
- Social Media Analytics (BUDT706)

2008 – 2010   **American Institutes for Research**

Educational Systems Information Scientist working on projects related to STEM education for struggling students and students with disabilities including managing technology contractor teams/projects to build community engagement tools, supporting a US Department of Education funded center focusing on assistive technology innovations, and developing accessibility positions for the National Education Technology Plan (NETP) and National Research Council Digital Simulations Program.

2000-2008   **Full-time Student**

Completed undergraduate, master's and doctoral degrees at the University of Maryland University College, Georgetown University, and the University of Michigan respectively.

1999 – 2000   **Correlation Technology, Inc.**

Startup working to develop a graph-based data management framework built on a Java platform to manage information about interrelated entities, including people and organizations.

1996 – 1999   **Oracle Corporation**

IT Consulting Curriculum Manager (98-99). Responsible for a worldwide training program for business/technology consultants built around the Oracle product stack. Responsible for several independent teams, each ranging from 4-8 members drawn from internal and partner organizations. Technology included traditional and object-oriented software engineering tools. Responsible for team development, budging, and management reporting. Member of global cross-organizational Product Release Process team.

IT Instructor/Course Developer (96-98). Developed Business Process Re-engineering (BPR) courses and taught courses on database technology to professionals in the U.S.

1987 - 1996   **CGI Systems, an IBM Company**
Software Product Manager (94-96). Responsible for 8-person team developing a specialized lateral engineering tool that converted software written in one computer platform to another.

IT Consulting Manager (87-94). Managed 15-person consulting office providing technology services. Responsible for entire business cycle: from proposal to staffing and execution.

Pre-1987   **DBMS, Inc.**
Software Developer/Manager. Designed and coded software applications for commercial and government clients.

BOOKS

Piety, P (April, 2013) *Assessing the Educational Data Movement.* Teachers College Press, Technology, Education – Connections (TEC) series (http://store.tcpress.com/0807754269.shtml).

BOOK CHAPTERS

BC1 - Niemi, R. D. Pea, B. Saxberg, & R. E. Clark (Eds.), *Learning analytics in education* (pp. 215–232). Charlotte, NC: Information Age.

Niemi, D, Pea, R, Piety, P (2018). Introduction. In D. Niemi, R. D. Pea, B. Saxberg, & R. E. Clark (Eds.), *Learning analytics in education* (pp. 1–48). Charlotte, NC: Information Age.

Behrens, J. T., Piety, P., DiCerbo, K. E., & Mislevy, R. J. (2018). Inferential foundations for learning analytics in the digital ocean. In D. Niemi, R. D. Pea, B. Saxberg, & R. E. Clark (Eds.), *Learning analytics in education* (pp. 1–48). Charlotte, NC: Information Age.

Moss, P., & Piety, P. (2007). Introduction: *Evidence and Decision Making.* Yearbook of the National Society for the Study of Education. Blackwell, Chicago, IL:

PEER REVIEWED PUBLICATIONS AND CONFERENCE PAPERS

Piety, P.J. (2019). *Components, Infrastructures, and Capacity; The Quest for the Impact of Actionable Data Use on P-20 Educator Practice.* Review of Research in Education, 43.

Piety, P. J., Hickey, D. T., & Bishop, M. J. (2014, March). *Educational data sciences: framing emergent practices for analytics of learning, organizations, and systems.* In Proceedings of the Fourth International Conference on Learning Analytics and Knowledge (pp. 193-202). ACM.

Piety, P. (2011). *Educational Data Use: A Sociotechnical Process.* Measurement: Interdisciplinary Research & Perspective, 9(4), 217-221.

Piety, P (2008) *Science Assessment in Michigan Middle Schools.* Paper for the Michigan Science Teachers Association Journal (Spring, 2008).

Piety (2004) The Language System of Audio Description: An investigation as a Discursive
Process. *The Journal of Visual Impairment and Blindness,* 98(8) 453-469.

PRESENTATIONS AND SPECIAL SESSIONS

Piety, P. (2019). *Looking For Impact Across Data use Practices: An Evidence Evaluation Framework from
a Literature Review.* Paper for the American Educational Research Association annual
meeting. Toronto, CA

Piety, P. (2016). *Education Data Science/Education Data Practice: From Parallel Play to Synergy.*
Maryland State Department of Education Data Summit, Towson, MD

Piety, P. Hickey, D., and MJ Bishop (2013). *Educational Data Sciences – Framing Emergent Practices
for Analytics of Learning, Organizations, and Systems.* Submitted to 2014 Learning Analytics &
Knowledge Conference.

Piety, P; Pea. R; Behrens, J (2013). *Big Data in Education: Arguing for an Educational Decision Sciences.*
Paper for the American Educational Research Association annual meeting. San Francisco,
CA.

Behrens, J. Mislevy, R; Piety; and DiCerbo (2013). *Evidence Centered Design for Learning Analytics.
Commissioned* paper for Learning Analytics Workgroup. Roy Pea, principal investigator

Piety, P; Behrens, J; Baker, R; Guidera, A; Styles, K (20130 *Big Data American Style.* Symposia for
the American Educational Research Association (Division H), San Francisco, CA.

Piety, P; Behrens, J; Linn, M; Byrnes, J; Tindal, J; Coleman, L; Buckley, J, Beuschel, A; Deiterle,
E; Gummer, E. (2013) *Big Data: New Opportunities for Measurement & Data Analysis.*
Presidential invited session for the National Council on Measurement in Education
annual meeting San Francisco, CA.

Piety, P., Dede, C.. Halverson, R., Loeb, S., Supovitz, J., Talbert, J. (2010) *Towards a Holistic
Research Agenda into Data and Decisions in Education: Methodological Possibilities for Studying
Information Across Systemic Levels.* Symposia for the American Educational Research
Association (Division D), Denver, Colorado.

Piety, P. (2010) *Actors and Actants in Education: Are Recent Trends in Evidentiary Systems and
Instructional Responsibility Parallel Trends or Janus Head?* Paper to be presented at the
American Educational Research Association (Division A), Denver, Colorado.

Piety, P. (2008). *Classroom Practices and Boundary Practices: Information Integration Points for Middle
School Science Assessment.* Paper presented at the American Educational Research
Association (Division H), New York,

Piety, P. (2007, August). *Learning Progressions: Four Systemic Considerations.* Poster presented at the
annual Knowledge Sharing Institute, Center for Curricular Materials in Science,
Washington, DC.

Piety, P. (2007, April). *Learning Progressions: Systemic Considerations for Implementation.* Paper
presented at the American Educational Research Association (Division C), Chicago, IL.

Draney, K., Mohan, L., Piety, P., & Choi, J. (2007, April). *Learning Progressions in the Carbon Cycle*. Paper presented at the American Educational Research Association (Division C), Chicago, IL.

Piety and Palincsar (2006, June). *"How Do We See?": Information Architecture as Theory.* Paper presented at the International Conference of the Learning Sciences, Bloomington, Indiana.

Piety (2006, April). *Genre and alignment in diagram and prose: A study of a diagram students use in published science educational materials and public assessments instruments.* Poster presented at the National Association of Research in Science Teaching, San Francisco, California.

Piety (2005, July). *Tracing the food web: Standards, assessments, and materials.* Poster presented at the annual Knowledge Sharing Institute for the Center for Curricular Materials in Science, East Lansing, Michigan.

Piety (2003, April) *Audio Description, A Visual Assistive Discourse.* Invited presentations based on this research to the National Center for Accessible Media (NCAM) within the Center for Applied Special Technology (CAST).

OTHER PUBLICATIONS

Piety (2003) *Audio Description, A Visual Assistive Discourse.* Unpublished thesis, Georgetown University, Washington, DC.

Piety (2001) "The Butterfly Show." Feature, the Washington Post's Gazette, p.1 May 23, 2001.

SERVICE

Manuscript Reviewer:
  Computing in Higher Education
  Journal of Technology Research in Education
  Education Policy
  AERA Open
Grant Reviewer:
  National Science Foundation: Innovative Technology Experiences for Students and Teachers
          (TTEST), Cyber-learning programs
  U.S. Department of Education: Race to the Top District (Personalized Learning)
              Investing in Innovation (i3) Fund
              Teacher Incentive Fund (TIF)
  Spencer Foundation: Teachers' Use of Data for Formative Assessment

Conference Reviewer:
  American Educational Research Association (2007, 2008, & 2013)
  National Association for the Research of Science Teaching (2006-8)
  International Conference on the Learning Sciences (2004, 2006, 2008)
  International Conference on Computer Supported Collaborative Learning (2005)

Technical Advisory Board:
Mathematics eText Research Center (MeTRC) funded by U.S. Dept of Education OSEP

Member:

Schools Interoperability Framework: Assessments Specification Working Group
American Foundation for the Blind Solutions Forum for Accessible Instructional Materials

AWARDS AND HONORS

American Council of the Blind: 2012 Margaret R. Pfanstiehl award for research

University of Michigan: Thomas A. & Elizabeth Mann Diamond Fellowship
Dean's Scholars Fellowship (2003, 2004, 2005, 2006)
Rackham School Dissertation Finishing Grant (2008)
School of Education Dissertation Finishing Grant (not taken)
Spencer Mini-Grant for Student Initiated Research (2007)
Rackham and School of Education travel grants (2006, 2007, 2008)

Georgetown University: Merit Scholar

MEMBERSHIPS AND AFFILIATIONS

- American Educational Research Association (Divisions D, C, H, and L)
- Educational Measurement, Psychometrics and Research Group Sponsored by the ETS
- American Society for Information Science and Technology
- International Society for the Learning Sciences
- Center for Curricular Materials in Science (Special Graduate Student Fellow)

SELECTED PROJECT EXPERIENCE

Lead Project Team for Computational Archival Science Education
Leading team of graduate students and staff to develop an infrastructure for a grant-supported project for Computational Archival Science. Infrastructure holds examples and educational material for an international audience to support the development of new awareness and competencies in this area.

Lead Data Architecture Re-engineering Project for Global Education Program (2010-2013)
Led analysis and design efforts to renovate the information infrastructure used by a global information technology education program operating in over 160 countries with traditional face-to-face and blended learning components. Responsible for the data architecture planning and analysis DBA activities using an adapted Agile methodology. Designed new central information architecture to provide coherence across an ecosystem of legacy platforms and partner organizations operating in each region with different approach to information management. Issue included, designing for common unique identifiers, federated authentication architecture, roles-based information access approach based on organizational structure, and data warehouse/business analytics functionality.

Member of Learning Analytics Workgroup (2012-2013)
A member of the Bill and Melinda Gates Foundation funded Learning Analytics Workgroup (LAW) that met with groups of stakeholders, including as part of the Learning Analytics Summer Institute (LASI-13), to help define a new profession by producing several reports and a possible book project.

Organized Symposia for Big Data in Education (2013)

For a large publisher, organized two symposia on "big data" in education. Both symposia featured a diverse group of scholars, federal education officials, reformers, and funders to present holistic views of educational data.

Managed Open Source Software Based Special Education Solutions Site (2009-2010)
For a Department of Education Office of Special Education Programs (OSEP) technical assistance (TA) contract managed the design and contract development of a web site that organized assistive technology information so consumers/product developers could perform complex searches based on the criteria relevant to multiple conditions of special education populations.

Adapted Applied Middle School Mathematics Curriculum for Charter Schools (2008)
As a consultant to the American Association for the Advancement of Science (AAAS), led the adaptation of a research-based applied mathematics curricula. Project involved detailed analysis of middle school mathematics learning standards, working with charter school teachers to assess and improve their understanding of the mathematics required to teach the curricula, and technical assistance.

Studied State Science Assessment Practices (2006-2008)
Studied the Michigan Office of Educational Assessment and Accountability's annual test development process from an information systems perspective. Analyzed item development/review that included teachers and other practitioners working in teams to evaluate candidate assessment items and the measured performance of items with different populations. Managed the institutional review board (IRB) process and recruited research sites.

Studied Learning Progressions for Next Generation Science Standards (2003-2006)
Participated in several related National Science Foundation funded projects to develop elementary and middle-school science curricula. Responsibilities included data collection in urban schools and analysis of video and paper artifacts to help evaluate the learning gains and issues associated with adoption of inquiry-based science units. Many of the projects were directly influential in the development of the Next Generation Science Standards.

Editorial Support for *Evidence and Decision Making Volume* (2006-2007)
Joined the project just after author recruitment and worked with Professor Pamela Moss to review and suggest recommended edits for chapters written by educational research leaders.

Studied Technology-assisted Reading for Struggling Readers (2004-2007)
Worked with the development of a research program to assess the impact that interactive electronic reader software with embedded supports on struggling and typical student reading comprehension. The supports were based on cognitive science research to scaffold conceptual development with potentially difficult to access concepts. Developed a research protocol to track student fine grained interactions with technology.

Evaluated Educational Science and Math Standards Database (2004)
For the American Association for the Advancement of Science, conducted an evaluation of a database that contained state science and math standards. The goal was to trace specific national standards (both the National Science Education Standards and the Benchmarks for Science Literacy) through various states. Analysis revealed that the design of the standards database was at incorrect level of granularity to be useful as intended.

Designed Academic Events Support Database (2002)

Worked with the Center for New Designs in Learning and Scholarship to design and implement a database application to track the customers and partners.

Software Architecture Manager for Federal Research Organization (1999-2000)
Led the analysis of multiple data systems used by the Office of Naval Research to track research programs and research products. Managed team of contractors redesigning core applications and participated in workgroups around data definitions for 11 grant making agencies.

Managed Global Technology Consulting Curriculum Program (1997-1999)
Managed the design and development of a technology curricula used across international consulting groups. Teams included subject matter experts and other staff from global consulting regions. Program fielded entire suite of 14 educational products, including a 12 week bootcamp, on time and within budget. Essential part of this project was a comprehensive learning goals database allowing teams to cross reference repurposed course material with custom components.

Managed Software Product Development Team (1994-1995)
Senior staff for IBM, led the technical team that designed and built a custom *lateral engineering* product that converted programs written in one computer program language to another retaining functionality on a different platform.