

COL(Ret) ALEX J. HEIDENBERG

PERSONAL INFORMATION

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Current Position Head, Mathematics Department
United States Military Academy Preparatory School
West Point, NY 10996

Previous Positions: Data Analyst
US Army Special Forces Command
Fort Bragg, NC 28310

Associate and Academy Professor
Director of the Core Mathematics Program
Department of Mathematical Sciences
United States Military Academy

Visiting Associate Professor
Department of Mathematics
Duke University

Professional Societies Mathematical Association of America (MAA)
National Honor Society, Phi Kappa Phi
National Honor Society, Pi Mu Epsilon (Mathematics)

ACADEMIC BACKGROUND

2000 Georgia State University Atlanta, Georgia

- Ph.D., Educational Research, Measurement, and Statistics
- Dissertation: Reducing Pretest and Gain Score Correlation Using Item Response Theory Domain Scores

1993 Georgia Institute of Technology Atlanta, Georgia

- M.S.O.R., Operations Research
- Thesis: An Automated Information and Distribution System for Habitat for Humanity International

1983 United States Military Academy West Point, New York

- B.S., Concentration in Operations Research

TEACHING EXPERIENCE

<u>Institution</u>	<u>Years</u>	<u>Courses</u>	
USMAPS	2019-	PIC	Pre-Calculus and Introduction to Calculus
Methodist University	2013	MA105	College Algebra
USMA	2012 – 2013	MA104 MA206	Differential Calculus Probability & Statistics
Campbell University	2012	Math 111	College Algebra
Duke University	2011 – 2012	Math 31L Math 25L	Lab Calculus I Lab Calculus and Functions I
USMA	2000 – 2011 1993 – 1996	MA103 MA103* MA104 MA104* MA205* MA206 MA488 MS202 MS302	Discrete Dynamical Systems Mathematical Modeling Single Variable Calculus Differential Calculus Integral Calculus Probability & Statistics Sabermetrics Small Unit Tactics Ground maneuver Warfare II
Georgia State	1998	Math 107 EPRS 855 EPRS 860	Introductory Statistics Educational Statistics III (co-taught) Computer Use in Ed. Rsrch (co-taught)
		* - course in new curriculum	

COURSE LEADERSHIP

<u>Years</u>	<u>Position</u>	<u>Courses</u>
AY04 – AY11,AY13	Director Core Mathematics	MA100, MA0101, MA103, MA153 MA104, MA205, MA255, MA206
AY01-03	Program Director	MA103 Discrete Dynamical Systems MA100 Pre-Calculus MA101 Discrete Dynamical Systems

EDUCATIONAL LEADERSHIP AT THE NATIONAL LEVEL

- PI – Core Mathematics: an NSF Grant of \$111,000 to revamp the content of our Core Mathematics Program.
- PI – Workshops That Improve Undergraduate Teaching of Mathematics: An NSF Grant of \$144,150.
- Participant in two Supporting Assessment in Undergraduate Mathematics (SAUM) Workshops. The first workshop began in 2002 and lasted two years. It consisted of three formal meetings and resulted in a published case study, several published articles, and several presentations at national conferences. The second workshop began in 2004. It also consisted of three formal meetings and resulted in a published case study, presentations and publications. I was invited to present details of our assessment program at each of these workshop meetings.
- Participant in the AAC&U Shared Futures Summer Institute at Sonoma State College (2007).
- Participant in the *Keck/PKAL Facilitating Interdisciplinary Learning* project (2008).

CURRICULUM DESIGN

- Director of the Core Math Program (2004 – 2011) – Responsible for the supervision of the four core course Program Directors and integration of the four-course program into one coherent curriculum that progressively integrates exploration, experimentation, and self-discovery through educational experiences that take advantage of technology and notebook computers in the classroom. Also responsible for the Advanced Mathematics Program (MA153/MA255) and the Pre-Calculus Program (MA100/MA101).
- Led the redesign of our core curriculum that included a restructuring of our initial course into a modeling and problem solving course and a remapping of our calculus sequence from a tradition Single Variable – Multi-Variable sequence to a Differential – Integral Calculus sequence that takes advantage of technology to transition concepts from the single variable to the multivariable domain.

FACULTY DEVELOPMENT

- As the Program Director for the first core course in the mathematics program (MA103), faculty development was one of my primary responsibilities. Twenty to twenty-five new faculty members arrive in the Department of Mathematical Sciences each summer. These faculty range from senior civilian professors and visiting professors with a wealth of experience to rotating junior military faculty about to embark on their first teaching experience. Regardless of their teaching experience and background, my role as the Director of the Faculty Development Workshop was twofold: prepare the incoming faculty to teach Mathematics at USMA and integrate the new faculty and their families into the Math Department. This six week workshop serves as the introduction to teaching Math at West Point and for many teaching in their first academic environment. The workshop establishes the “initial condition” for the department, creating the environment for continued professional growth of each incoming faculty member.

- As the Director of the Core Mathematics Program, my role in faculty development has changed. In this capacity, I am responsible for helping with the development of the senior faculty, specifically the program directors of the four core math courses. My emphasis has been to increase talks about teaching and assessment among our entire faculty. I have helped to instill a culture where Program Directors think content and assessment simultaneously.

ACCREDITATION

- ABET Committee – Department of Mathematical Sciences representative 2006 – 2008
- MSCHE Committee – Curriculum Working Group 2007 – 2009

SERVICE/CONTRIBUTIONS

- Curriculum Committee Member, 2009 - 2011
- Math & Science Goal Team Member, 2005 – 2011 **Chair of Committee (2009-11)**
- Ethics Committee of the Faculty Council, 2000 – 2010 **Chair of Committee (2009-10)**
- Assessment Steering Committee, 2008 - 2011
- Admissions Committee Member, 1994-1996, 2000 – 2011
- Advisory Committee, Center for Teaching Excellence, 2001 – 2011
- Observer for Master Teacher Program, CTE, 2002 – 2011
- Restricted Earnings Coach, Women's NCAA Softball Team 2000 - 2011
- Faculty Representative for the Woman's Softball Team from 1994 – 1996.
- Student Representative for the Academic Affairs Committee in the Department of Educational Policy Studies, Georgia State University.
- Student Representative for the Student Affairs Committee in the Department of Educational Policy Studies, Georgia State University.

AWARDS

- Air Command and Staff College Outstanding Community Service Award (1997).
- Distinguished Paper Award – Georgia Educational Research Association (1998).
- Outstanding Doctoral Student Award - Department of Educational Policy Studies, Georgia State University (1998-1999).

BOOK PUBLICATIONS

- Heidenberg, A., Huber, M., & Phillips, M., *Assessment of the Core Mathematics Program*, published in Assessment of Student Learning in College Mathematics: Toward Improved Programs and Courses, Volume 2 of Assessment in the Disciplines, Bernard L. Madison, editor, Association for Institutional Research.
- Heidenberg, A.J. & Huber, M.R., *Assessing the Use of Technology and Using Technology to Assess*, published in Supporting Assessment in Undergraduate Mathematics, a special volume for the MAA Notes Series on Supporting Assessment of undergraduate mathematics, Lynn A. Steen, editor, The Mathematical Association of America, 2005. This MAA Notes volume is scheduled to be mailed to all mathematics departments in the United States.
- Arney, D.C., Giordano, F.R., and Robertson, J.S., *Mathematical Models with Discrete Dynamical Systems*, edited by Heidenberg, A., and Huber, M., McGraw-Hill/Primis Custom Publishing, 2002.
- Heidenberg, A, and Huber, M, Solutions Manual to *Mathematical Models with Discrete Dynamical Systems*, McGraw-Hill/Primis Custom Publishing, 2002.

JOURNAL EDITOR

- Primus. 19(2), Guest Editor for Special Issue on Faculty Development

REFEREED PUBLICATIONS

- Fletcher HD, Heidenberg A, and Kobylski G. (2011) *Assessing a Course with "The State of the Union" Address*, Assessment Update, 23(2)6-7 & 15.
- Heidenberg, A., (2009). *Introduction to Special Issue on Faculty Development*. Primus. 19(2), 101-104.
- Burks, R., Heidenberg, A., Leoni, D., & Ratliff, T. (2009). *Supporting the Motivators: A Faculty Development Issue*. Primus. 19(2), 127-145.
- Huber, M., Heidenberg, A., Wilmer, A. & Phillips, M. (2006) *Connecting and Reflecting Using a Course-End Report for Assessment*. Assessment Update. 18(4), 9-11.
- Heidenberg, A. & Wasko, J. (2005) *Going Beyond the Basics: Creating and Inspiring Problem Solvers*. International Journal of Mathematical Education in Science and Technology, Vol 36(8), 813-825.
- Heidenberg, A. & Huber, M. (2003) *Assessment: Not a Dirty Word but an Attitude*. Assessment Update. 15(5), 5-6.
- Heidenberg, A.J & Huber, M.R. (2003). *Assessment: A Frame of Mind*, New Case Studies from Assessment at the Department Level Workshop #1, part of the Supporting Assessment in Undergraduate Mathematics (SAUM) project, sponsored by the Committee on the

Undergraduate Program in Mathematics (CUPM) and supported by a grant from the NSF Program on Assessment of Student Achievement, posted at www.maa.org/saum/new_case.html, July 2003.

- Heidenberg, A.J & Huber, M.R. (2003). *Assessing the Use of Technology and using Technology to Assess: A Case Study*, New Case Studies from Assessment at the Department Level Workshop #1, part of the Supporting Assessment in Undergraduate Mathematics (SAUM) project, sponsored by the Committee on the Undergraduate Program in Mathematics (CUPM) and supported by a grant from the NSF Program on Assessment of Student Achievement, posted at www.maa.org/saum/new_case.html, July 2003.
- Heidenberg, A. J., & Layne, B. H. (2000). Answer Changing: A Conditional Argument. *College Student Journal*, 34(3), 440-450.
- Hickey, D.T., Wolfe, E.W., and Kindfield, A.C.H. (1998). Assessing Learning in a Technology-Supported Genetics Environment: Evidential and Systemic Validity Issues. *Educational Assessment*; v6 n3 p155-96 1999-2000

NON-REFEREED PUBLICATIONS

- Huber, M., Phillips, M., & Heidenberg, A., *The Tragedy of Assessyphus*. TC Record: The Voice of Scholarship in Education. October, 2006.
- Heidenberg, A. & Sturdivant, R. (2006) Don't Forget to Make Your Connections. *Contemporary College Algebra* (68).
- Heidenberg, A., Schott, E., & Wasko, J. (2004) *Curriculum Change in a Changing World*. *Mathematica Militaris* 14(1).
- Heidenberg, A. J., Reducing Pretest And Gain Score Correlation Using Item Response Theory Domain Scores, Doctoral Dissertation, Georgia State University, 2000.
- Hickey, D.T., Heidenberg, A.J., Horwitz, P., Schwartz, J., Wolfe, E.W., Kindfield, A.C.H., and Yessis, L.M. (1998). Implementation and Evaluation of Genscope™ Learning Environment: Issues, Solutions, and Results, Proceedings of the Third Annual International Conference of the Learning Sciences, Association for the Advancement of Computers in Education.
- Heidenberg, A. J., An Automated Information and Distribution System for Habitat for Humanity International , Master's Thesis, Georgia Institute of Technology, 1993.

PRESENTATIONS

- Heidenberg, A., Kobylski G., & Small D., (2007) *Core Mathematics*. Joint Math Meetings 2007, New Orleans, LA.
- Heidenberg, A.J. & Huber, M.R. (2006) Session Organizers – Teaching and Assessing Problem Solving. Joint Math Meetings 2006, San Antonio, TX.
- Huber, M.R., Brown, R., Costa, G., & Heidenberg, A.J., *Modeling Problems and Remodeling Attitudes*, Joint Math Meetings 2006, San Antonio, TX.
- Sturdivant, R. X., Heidenberg, A.J., & Souhan, B. *Involving Students in Their Own Learning: Course End Presentation*, Joint Math Meetings 2006, San Antonio, TX.
- Kuhlmann, G., Kobylski, G., Heidenberg, A., & Picciuto, J., *A Course BEFORE Calculus, but not necessarily BELOW Calculus, Continued Growth and Evolution*, Joint Math Meetings 2006, San Antonio, TX.
- Huber, M.R. & Heidenberg, A.J., *Using a Course-End Report for Assessment*, Paper presented at Mathfest 2005, Albuquerque, NM.
- Krahn, G. , Heidenberg, A.J. & Picciuto, J. (2005) *Invited Speaker – MAA Special Presentation: A problem-based core program*. Joint Math Meetings 2005, Atlanta, GA.
- Heidenberg, A.J. & Huber, M.R. (2005) Session Organizers – *Teaching and Assessing Problem Solving*. Joint Math Meetings 2005, Atlanta, GA.
- Heidenberg, A.J. & Huber, M.R. (2005) *Teaching and Assessing Problem solving in the Technology Age: A sharing of successes and failures*. Joint Math Meetings 2005, Atlanta, GA.
- Picciuto, J. & Heidenberg, A.J. (2005) *A Course BEFORE Calculus, but not necessarily BELOW Calculus*. Joint Math Meetings 2005, Atlanta, GA.
- Heidenberg, A.J. (2004) Panel Member MAA Panel Discussion *How to Assess problem Solving*. Joint Math Meetings 2004, Phoenix, AZ.
- Huber, M.R. & Heidenberg, A.J. (2004) Year Two: *Assessing Notebook Computer Use In Two Freshman Core Mathematics Programs*. Poster Session Assessment of student learning in undergraduate mathematics. Joint Math Meetings 2004, Phoenix, AZ.
- Heidenberg, A.J., Schott, E.W., & Wasko, J.A. (2004) *They know, we know, that they don't know: Integrating Technology into Teaching and Assessing*. Paper presented at Joint Math Meetings 2004, Phoenix, AZ.
- Wasko, J.A. & Heidenberg, A.J. (2004) *Going Beyond the Basics: Creating and Inspiring Problem Solvers*. Paper presented at Joint Math Meetings 2004, Phoenix, AZ.
- Wasko, J.A., Heidenberg, A.J., & Schott, E.W. (2004) *Piece-wise Projects*. Paper presented at Joint Math Meetings 2004, Phoenix, AZ.
- Huber, M.R. & Heidenberg, A.J., *Assessing the Value of Laptop Computers to Student Learning in a Large Core Mathematics Program*, Paper presented at Mathfest 2003, Boulder, Colorado.
- Heidenberg, A. J. (2003) Panel Member, MAA Panel Discussion *Laptops in the Classroom*. Joint Math Meetings 2003, Baltimore MD.
- Schott E. W., Heidenberg, A. J., & Wasko, J. A. (2002). *The Keyboard vs. The Pencil: One approach to incorporating technology into assessment*. Paper presented at Joint Math Meetings 2003, Baltimore, MD.

- Heidenberg, A. J., & McCassey, M.M. (2002). *Integrating and Teaching with Laptops in the Calculus Classroom*. Paper presented at Joint Math Meetings 2003, Baltimore, MD.
- Wasko, J. A., Heidenberg, A. J., & Schott E. W. (2002) *Graphing Calculator; Friend or Foe?* Paper presented at Mathfest 2002, Burlington, VT.
- McCassey, M.M. & Heidenberg, A. J. (2002). *Integration of Laptops into the Classroom at USMA*. Paper presented at Mathfest 2002, Burlington, VT.
- Heidenberg, A. J., & Huber, M.R. (2002). *Reading and Writing in Mathematics*. Roundtable Chairman at the Annual Conference for The First-Year Experience 2002, Orlando, FL.
- Heidenberg, A. J., & Snook, K. (2001). *Leveling the Playing Field: High School to College Transition at USMA*. Paper presented at Mathfest 2001, Madison, WI.
- Heidenberg, A. J., & Neel, J. H. (1999, October). *Reducing Pretest and Gain Score Correlation using Item Response Theory domain Scores*. Paper presented at the annual meeting of the Georgia Educational Research Organization, Morrow, GA.
- Heidenberg, A. J., & Layne, B. H. (1999, April). *Answer Changing: A Conditional Argument*. Paper presented at the annual meeting of the American Educational Research Organization's Distinguished Papers Section, Montreal, Canada.
- Hickey, D.T., Kindfield, A.C.H., Heidenberg, A.J., & Wolfe, E.W. (1999, March). *Genscope Evaluation Design And Learning Outcomes*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Boston, MA.
- Hickey, D.T., Kindfield, A.C.H., Heidenberg, A.J., & Wolfe, E.W. (1998, December). *Genscope Evaluation Design And Learning Outcomes*. Paper presented at the 3rd International Conference of the Learning Sciences, Atlanta.
- Heidenberg, A. J., & Layne, B. H. (1998, November). *Answer Changing: A Conditional Argument*. Paper presented at the annual meeting of the Georgia Educational Research Organization, Morrow, GA.