Nicole B. Kersting

University of Arizona
Department of Educational Psychology
College of Education,
1430 East Second Street
Tucson, AZ 85721

Phone: 520-621-8737; cell 310-570-7480
Fax: 520-621-7877
Email: nickik@arizona.edu

Chronology of Education

Ph.D. **University of California, Los Angeles,** Education, Division of Research Methodology, Advanced Quantitative Methods, 2005
Dissertation: *Assessing Teachers' Knowledge of Teaching Mathematics: Instrument Development and Validation* (Chair: Dr. Noreen Webb)

M.A. **University of California, Los Angeles,** Education, Division of Research Methodology, Advanced Quantitative Methods, 2002
University of California, Berkeley, Intercampus Exchange Program, 2001

M.A. **Friedrich-Wilhelm University of Bonn, Germany**, German and Romance Languages, Linguistics, and Literature, 1994 [At that time a Masters degree was the basic university degree awarded in Germany following a 7-year course of study and the completion of a thesis]

Chronology of Employment

Associate Professor of Quantitative Research Methodology — 2022 - present
Department of Educational Psychology
University of Arizona

Associate Professor of Quantitative Research Methodology — 2015 - present
Department of Teaching, Learning, and Sociocultural Studies &
Faculty Member of the Interdisciplinary Graduate Program in Statistics (GDIP) — 2010- present
University of Arizona

Assistant Professor of Quantitative Research Methodology — 2009 - 2015
Department of Teaching, Learning, and Sociocultural Studies — 2011 - 2015
Department of Educational Psychology — 2009 - 2010
University of Arizona

Research Scientist — 2005 - 2009
LessonLab Research Institute, Santa Monica, CA

Graduate Student Researcher — 2004 - 2005
LessonLab Research Institute, Santa Monica, CA

Graduate Student Researcher — 2001 - 2004

Graduate School of Education and Information Studies, University of California, Los Angeles, CA

Teaching Assistant 2002
Graduate School of Education and Information Studies, University of California, Los Angeles, CA

Research Associate (Country Associate for Switzerland, 1998 – 2001
Third International Mathematics and Science Video Study (TIMSS Video 1999)
LessonLab Research Institute, Santa Monica, CA

Research Associate, Third International Mathematics and Science 1995 – 1998
Video Study (TIMSS Video 1994)
Department of Psychology, University of California, Los Angeles

Honors and Awards

Recipient of the Leigh Burstein Award of Research Methodology for innovative dissertation work. Graduate School of Education & Information Studies (GSEIS), University of California, Los Angeles. 2004

CAESL Fellow, the Center for the Assessment and Evaluation of Student Learning (CAESL) is a national center funded by the National Science Foundation in partnership with WestEd, the UC Berkeley Graduate School of Education, UCLA, and Stanford University. 2002 - 2004

Travel Grant, Graduate School of Education & Information Studies (GSEIS), University of California, Los Angeles. 2003

Regents Stipend, University of California, Los Angeles. 2003

Travel Grant, Graduate School of Education & Information Studies (GSEIS), University of California, Los Angeles. 2002

Departmental Fellowship, Graduate School of Education & Information Studies (GSEIS), University of California, Los Angeles. 2002

Service / Outreach

National/International Outreach

Served a 4-year rotation on the grant merit review panels of the Institute of Educational Sciences (IES) 2014 - 2017

Served as peer reviewer for the following journals: 2015 - present
ZDM – International Journal for Mathematics Education (ZDM)
American Educational Research Journal (AERJ)
Journal for Teacher Education (JTE)

Cognition and Instruction (CI)
Educational and Psychological Measurement (EPM)
Comparative Education Review (CER)

Departmental Committees

Student Attainment Committee (EDP)	2023 - present
Annual Review Committee, member & chair (EDP)	2024 – 2025
Member of 3rd Year Review Committee	2024
Annual Review Committee (TLS)	2020
Promotion & Tenure Committee (TLS)	2016 - 2017
Awards & Operations Committee (TLS)	2016 - 2017
Graduate Curriculum Committee (TLS)	2016 - 2017

College Committees

Awards Committee (EDP)	2024 - present
College Council representative (for TLS)	2017 - 2021
Co-Chair of the College Strategic Plan Research, Knowledge and Innovation Goal Working Group	2019

University Committees

Member of the Student Admission Committee of the Interdisciplinary Graduate Program (GDIP) in Statistics, University of Arizona.	2020, Spring

Other Committees

Member of Career-Track to Tenure-Track Conversion Committee	2022
Member of the EDP Learning Science Faculty Search Committee	2021, Fall
Member of the Search Committee for Associate Dean of Finance	2020, Winter
Member of the EDP Learning Science Faculty Search Committee	2020, Winter
Annual Review for faculty member in EDP (due to lack of available EDP faculty)	2019

Publications/Creative Activity

Chapters in scholarly books and monographs

Kersting, N. B., Stevenson, P. º, & Chen, M. - K. º (2016). Exploring Issues of Dimensionality and Model Selection: Practical Considerations from the Classroom Video Analysis (CVA) Instrument Development Effort. In A. Izsák, J. T. Remillard, & J. Templin (Eds.), *Psychometric methods in mathematics education: Opportunities, challenges, and interdisciplinary collaborations*. Journal for Research in Mathematics Education monograph series. Reston, VA: National Council of Teachers of Mathematics. ISSN-9530.

Webb, N., Ing, M., Kersting, N*., & Nemer, K. (2006). Help Seeking in Cooperative Learning Groups. In: Karabenick, S. & Newman, R (Eds.). *Help Seeking in Academic Settings* (p.45-89). Mahwah, NJ: Lawrence Erlbaum Associates.

Refereed journal articles, published or accepted in final form

Kersting, N.B., Smith, J.E. & Vezino, B. (2021). Using authentic video clips of classroom instruction to capture teachers' moment-to-moment perceiving as knowledge-filtered noticing. *ZDM Mathematics Education,* 53, 109–118. https://doi.org/10.1007/s11858-020-01201-6

Kersting, N.B., Smith, J.E[o]., Vezino, B. [o], Chen, M.-K. [o], Wood, M. B., & Stigler, J. W. (2020). Exploring the affordances of Bayesian networks for modeling usable knowledge and knowledge use in teaching. *ZDM Mathematics Education* 52**,** 207–218. https://doi.org/10.1007/s11858-020-01135-z

Ramirez, G., Hooper, S. Y., Kersting, N. B., Ferguson, R., & Yeager, D. (2018). Teacher math anxiety relates to adolescent students' math achievement. AERA Open, *4*(1). doi:10.1177/2332858418756052.

Heshmati, S[o]**.,** Kersting, N., & Sutton, T[o]. (2017). Opportunities and Challenges of Implementing Instructional Games in Mathematics Classrooms: Examining the Quality of Teacher-Student Interactions during the Cover-up and Un-cover Games. *International Journal of Science and Mathematics Education*, 1-20. DOI: 10.1007/s10763-016-9789-8.

Kersting, N. B., Sutton, T[o]. Kalinec-Craig, C. [o], Stoehr, K. J. [o], Heshmati, S. [o], Lozano, G., & Stigler, J. W. (2016). Further Exploration of the Classroom Video Analysis (CVA) Instrument as a Measure of Usable Knowledge for Teaching Mathematics: Taking a Knowledge System Perspective. *ZDM – International Journal for Mathematics Education*, 48(*1*), 97-109. doi:10.1007/s11858-015-0733-0

Kersting, N. B., Sherin, B. & Stigler, J. W. (2014). Automated Scoring of Teachers' Open-Ended Responses to Video Prompts: Bringing the Classroom Video Analysis (CVA) Assessment to Scale. *Educational & Psychological Measurement,* 74(*6*), 950-974. doi:10.1177/0013164414521634

Kersting, N. B., Chen, M.-K. [o] & Stigler, J. W. (2013). Value-Added Teacher Estimates as Part of Teacher Evaluations: Exploring the Effects of Data and Model Specifications on the Stability of Teacher-Value Added Scores. In A. Amrein-Beardsley, C. Collins S. Polasky and E. Sloat (Eds.) *Value-Added: What America's Policymakers Need to Know and Understand*, Special issue on value-added research for policy. *Educational Policy Analysis Archives*. http://epaa.asu.edu/ojs/article/view/1167.

Kersting, N. B., Givvin, K. B., Thompson, B., Santagata, R. & Stigler, J. (2012). Developing Measures of Usable Knowledge: Teachers' Analyses of Mathematics Classroom Videos Predict Teaching Quality and Student Learning. *American Educational Research Journal, 49(3),* 568-590. doi:10.3102/0002831212437853

Santagata, R., Kersting, N., Givvin, K., & Stigler, J. (2011). Rich Problems as a Lever for Change: An Experimental Study of the Effects of a Professional Development Program on Students' Mathematics Learning. *Journal of Research on Educational Effectiveness, 4,* 1-24. doi: 10.1080/19345747.2010.498562

Kersting, N. B., Givvin, K., Sotelo°, F., & Stigler, J. W. (2010). Teacher's Analysis of Classroom Video Predicts Student Learning of Mathematics: Further Explorations of a Novel Measure of Teacher Knowledge. *Journal of Teacher Education*, Vol. 61, No. 1-2, 172-181. doi:10.1177/0022487109347875

Kersting, N. (2008). Using Video Clips as Item Prompts to Measure Teachers' Knowledge of Teaching Mathematics. *Educational and Psychological Measurement, vol. 68, 845-861.* doi:10.1177/0013164407313369

Hiebert, J., Gallimore, R., Garnier, H., Bogard Givvin, K., Hollingsworth, H. Jacobs, J., Chui, A. M., Wearne, D., Smith, M., Kersting*, N., Manaster, A., Tseng, E., Etterbeek, W., Manaster, C., Gonzales, P. and Stigler, J. W. (2003). *Understanding and Improving Mathematics Teaching: Highlights from the TIMSS 1999 Video Study.* Phi Delta Kappan, *84*, 768-775.

Other Scholarship

Conference Proceedings

Ayalon, M., Kosko, K. W., Kersting. N. B. (2023). Methodological Approaches to the Study of Teacher Noticing. In: Michal Ayalon, Boris Koichu, Roza Leikin, Laurie Rubel & Michal Tabach (Eds.). Proceeding of the 46th Conference of the International Group for the Psychology of Mathematics Education (Vol. 1). University of Haifa, Israel: PME.

Sherin, B., Kersting, N., & Berland, M. (2018). Learning Analytics in Support of Qualitative Analysis. In Kay, J. and Luckin, R. (Eds.) Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018, Volume 1. London, UK: International Society of the Learning Sciences.

Other

Kersting, N. B. (2014). Why "Engineering" Teacher Evaluation Systems is best (2014). *Teachers College Record*, Date Published: July 11, 2014. http://www.tcrecord.org ID Number: 17599, Date Accessed: 7/17/2014

Kersting, N. B. (2011). Studying teacher knowledge and its impact on teaching and student learning. *Imagine Research,* Winter 2010, p. 3-5.

Kersting, N. K. (2009), The Classroom Video Analysis Instrument *(CVA),* published at https://www.teknoclips.org.

U.S. Department of Education, National Center for Education Statistics. *Teaching Mathematics in the United States: Comparing the Results from the TIMSS 1995 and TIMSS 1999 Video Studies of Eighth-Grade Mathematics Lessons.* NCES (2003), by Hiebert, J., Gallimore, R., Garnier, H., Bogard Givvin, K., Hollingsworth, H., Jacobs, J., Chui, A. M., Wearne, D., Smith, M., Kersting*, N., Manaster, A., Tseng, E., Etterbeek, W., Manaster, C. and Stigler, James. W. Washington, DC: 2003.

Works in Progress

Kersting, N. B., Xiong[o], R., Mercier[o], N. R., Demaree[o], M., Wilson, R. (accepted with revisions). Exploring the use of Bayesian networks to model noticing patterns for groups of teachers and changes in noticing patterns over time. *ZDM – International Journal for Mathematics Education*

Li, R., Kersting, N. B., Cao, Y. (accepted with revisions). Exploring mathematics teachers' professional noticing in authentic classrooms: An expert-novice analysis through mobile eye tracking and retrospective interviews. *ZDM – International Journal for Mathematics Education*

Li, R., Cao, Y. Kersting, N. B., Kaiser, G. (accepted with revisions). Visual perception of expert and novice mathematics teachers across student profiles during instruction: Insights from mobile eye tracking. *ZDM – International Journal for Mathematics Education*

Kersting, N. K., Smith, J. E., Vezino, B., Mercier, N., & Wilson, Robert (to be submitted to Journal of Educational Psychology or Educational Psychologist). A Reinforcement Learning Framework to Understand Teacher Learning and Decision Making in the Classroom.

Kersting, N. K., Smith, J. E., Xiong, R., Mercier, N., Vezino, B., Udun, Y. (in preparation). Using Bayesian Networks to Model Knowledge Activation in More and less Expert Mathematics Teachers' Questions: Implications for Instructional Decision Making

Conferences / Scholarly Presentations

Conference/Scholarly Presentations submitted

Kersting, N. B. (July, 2023). Examining knowledge-based aspects of noticing. Paper accepted at the International Conference of Psychology of Mathematics Education (PME) PNME, Haifa, Israel.

Kersting, N. B., Smith[o], J. E., Vezino[o], B., Mercier[o], N. R., Xiong[o], R., &. Udun[o], Y.(April 2022). *Capturing, Modeling, and Conceptualizing Usable Teacher Knowledge in Mathe*matics. Paper accepted at the annual meeting of the American Educational Research Association, San Diego, CA.

Kersting, N. B., Smith[o], J. E., Vezino[o], B., Mercier[o], N. R., Chen[o], M.-K., Salazar[o], F., Wood, M. & Stigler, J. (April, 2021). *Usable, Common Core-aligned Fraction Teaching Knowledge Predicts Student Learning on Fraction Quiz and Standardized Test*. Paper accepted at the annual meeting of the American Educational Research Association, online.

Kersting, N. B., Vezino[o], B., Smith[o], J. E., Chen[o], M.-K., Wood, M. B., & Stigler, J. W. (April 2020). Using Bayesian networks to model teachers' usable knowledge and knowledge use in teaching. (Roundtable Paper accepted at the at the annual meeting of the American Educational Research Association, San Francisco, CA.

Smith[o], J. E., Kersting, N. B., Vezino[o], B., Chen[o], M. – K. & Stigler, J. W. (April 2020). Modeling Mathematical Teaching Knowledge Relationships for Different Teaching Practice Using Bayesian Networks. (Roundtable Paper accepted at the at the annual meeting of the American Educational Research Association, San Francisco, CA.

Kersting, N. B., Smith[o], J. E., Wood, M.B., Vezino[o], B., Chen[o], M.K., & Stigler, J. W. (2020). Teacher Understanding of the Mathematical Practices: A Lay of the Land. *Association of Mathematics Teacher Educators (AMTE) 2020,* Phoenix, Arizona.

Smith, J.E. [o], Kersting, N. B., Udun[o], Y., & Vezino[o], B. (2019). Identifying activated knowledge: Capturing complex knowledge in use. *Psychology of Mathematics Education-North American Chapter (PME-NA) 2019*, St. Louis, Missouri

Kersting, N. B., Vezino[o] B., Smith[o] J., Chen[o], M.-K., & Stigler, J. W. (April, 2018). *Developing Measures of Usable, Common Core-aligned Mathematics Teaching Knowledge (CVA-M): Between Knowledge and Performance*. Paper accepted at the annual meeting of the American Educational Research Association, Toronto, Canada.

Kersting, N. B., Chen[o], M.-K., Lozano, G., Heshmati[o], S., Stoehr[o], K. J., & Stigler, J. W. (2016, April). *Extending the CVA into a Content-focused, Common Core Aligned Measure of Mathematics Knowledge for Teaching*. In K. King (Chair): Developing and Validating Indicators for Teachers' Science and Mathematics Content Knowledge for Teaching. Symposium accepted at the annual meeting of the American Educational Research Association, Washington, D.C.

Conference/Scholarly Presentations invited

Kersting, N. B., Smith[o], J. E., Vezino[o], B., Chen[o], M.-K., Wood, M. B., & Stigler, J. W. (2018, December). Aligning Current Views of Cognition with Measuring Usable Mathematics Teaching Knowledge and Decision-Making. *Junior Faculty Research Conference, Berlin, Germany.*

Kersting, N. B. (2017, September). *Classroom Video Analysis: What makes a good clip and what makes a good task?* Invited presentation at the International Congress within the Frame of the Quality Initiative on Teacher Education. *New perspectives on future teacher's professional competencies from an international perspective*. University of Hamburg, Hamburg, Germany.

Awarded Grants and Contracts

Federal

Developing and Validating a Scalable, Classroom-focused Measure of Usable Knowledge for Teaching Mathematics: The Classroom Video Analysis - Common Core Mathematics (CVA-M) Instrument 2017-2021

Principal Investigator: Nicole B. Kersting
Funded by the National Science Foundation (NSF) DRpreK-12 Program, Assessment Strand, award #: 1720866.
Percent Credit: 100%
FTE: 0.20

Years of Funding: 4 Years
Award amount: $ 2,000,536.
IDC: $651,164 @ 53.5%.

Collaborative Proposal: Mathematical Modeling with Community Contexts 2017 - 2019
Principal Investigator: Erin Turner
Key Personnel: **Nicole B. Kersting**
Research funded by the National Science Foundation (NSF), Core Research (ECR) Fundamental Research in Science, Technology, Engineering and Mathematics (STEM) Education program, award # 1561305.
This project seeks to develop a professional development program for upper elementary teachers to help them learn about and implement mathematical modeling lessons in their classrooms, specifically for teachers of diverse learners.
Percent Credit: 0%
FTE: 0.5
Award amount: $708,632 (UofA funding from total award of $2,994,523.00)
IDC: $ 133,091 (of total IDC $554,548 @ 53.5%)

Adapting the Classroom Video Analysis Approach as a Feasible and Scalable Measure of Common-Core-Aligned Mathematics Knowledge for Teaching (Indicator 6). 2014 -2016
Principal Investigator: **Nicole B. Kersting**
Research Funded by the National Science Foundation (NSF), EAGER grant under the PRIME competition, award # 1445431. This project extends the original Classroom video analysis approach to become a content-specific and scalable measure of the Common Core State Standards in Mathematics (CCSS-M). Existing CVA video items on the topic of fractions will be mapped to the Common Core Standards and new item formats around video clips will be developed. Item functioning and score reliability will be explored and evidence on predictive validity vis-a-vis student learning will be examined.
Percent Credit: 100%
FTE: 0.20 + 1summer month for Year 2
Years of Funding: 2
Award Amount: $299,445.
IDC: $93,987 @ 51.5%

Private Foundation
Teachers as Learners – Teachers as Thinkers: Improving Classroom Communication in Mathematics
Principal Investigator: ***Nicole B. Kersting***
Co-PIs: Robert Wilson, Michelle Perry (left project during Year 2), 2020-2026
Meghan Bates Schleppenbach (left project during Year 2)
Research funded by the James S. McDonnell Foundation,
Teachers as Learners, award # 220020586

Effective Classroom communication requires that teachers can effectively apply their knowledge and skills in real time. In this 5-year project, we study a theoretical model for improving classroom communication in the context of sharing student work. The model explicitly moves away from viewing teachers as the executors of practiced approaches towards a theoretical model in which teachers are thinkers and effective decision-makers.
Percent Credit: 80%
FTE: 0.15, 0.30, 0.30, 0.30
Years of Funding: submitted initially as 4 years, asked by foundation to extend to 6 years
Award amount: $2,498,237.
IDC: N/A

Grant Collaborations

Understanding and Improving Learning from Online Mathematics Classroom Videos 2016-2020

Principal Investigators: Michelle Perry (P.I.), University Illinois Urbana Champaign; Meg Bates (Co-P.I.) University of Chicago; Joseph Paul Robinson-Cimpian (Co-P.I.), University Illinois Urbana Champaign; Research funded by the National Science Foundation (NSF), Discovery Research (DRK-12), award # 1621253.
My Role: Collaborator and Advisory Board Member
This project uses custom scales of our CVA instrument developed in collaboration with the P.I.s to measure teachers' usable knowledge of teaching numbers and operations and fractions.

Understanding the Effects of Mathematics Teacher Preparation on the Quality of Classroom Teaching and Students' Learning 2014 - 2017

Principal Investigators: Dawn Berk & James Hiebert, University of Delaware, DE
My Role: Consultant on usable knowledge measures
The project, which seeks to connect mathematics teacher preparation, teaching practice, and student learning, uses the CVA measures as one of the measures to assess teachers' usable teaching knowledge over time.
Research Funded by the National Science Foundation (NSF), Research on Education and Learning (REAL) program, award # 1420578