

PROMOTION RECOMMENDATION
The University of Michigan
School of Education

Approved by the
Regents
May 21, 2015

Elizabeth A. Davis, associate professor of education, with tenure, School of Education, is recommended for promotion to professor of education, with tenure, School of Education.

Academic Degrees:

- Ph.D. 1998 University of California, Berkeley, Education in Mathematics, Science, and Technology
M.A. 1994 University of California, Berkeley, Education in Mathematics, Science, and Technology
B.S.E. 1989 Princeton University, Engineering, Princeton, NJ

Professional Record:

- 2006 – present Associate Professor (with tenure), Educational Studies, School of Education, University of Michigan
2010 – 2014 Chair of Elementary Teacher Education, School of Education, University of Michigan
1998 – 2006 Assistant Professor, Educational Studies, School of Education, University of Michigan

Summary of Evaluation:

Teaching: Professor Davis is a careful and reflective teacher who brings her skill to undergraduate teacher education and doctoral courses. Her undergraduate courses are exemplary for science teacher education, both in their attention to scientific concepts and practices and in their devotion of effort to students' learning to teach from practice. Her courses are rigorous, highly relevant, and designed to promote excellent teaching of science at the elementary level. Professor Davis provides students with consistent opportunities to hone their teaching skills and science practices. Student evaluations for her undergraduate courses speak to Professor Davis' skill, with scores between 4 and 5 for the questions regarding the quality of the course and the instructor most years. Former undergraduate students describe Professor Davis as an excellent teacher and one who cares for their development as teachers.

Professor Davis also brings her skill to bear in the doctoral course she teaches. Her course, The Development of Expertise in Science Teaching, socializes science education PhD students into a growing area of research on science teaching, demonstrating Professor Davis's adeptness in crossing scholarly boundaries in search of excellent scholarship. Her student evaluations are particularly strong for this course. Scores for the question "Overall, this was an excellent course" range from 4.17 to 5.00. Scores for the question "Overall, the instructor was an excellent teacher" range from 4.50 to 5.00.

Outside of the classroom, Professor Davis has an impressive record of mentorship and involvement in graduate advising. Seven students finished dissertations under her direction. One student received the National Association for Research in Science Teaching (NARST) Early Career Research Award (given to an early career faculty member pre-tenure). She has also served as a dissertation committee member for 28 completed dissertations. Currently, Professor Davis is supervising one dissertation and is on the committee of four other doctoral students. She has also mentored four post-doctoral scholars. A salient element of Professor Davis' mentorship is her consistent involvement of graduate

students and postdocs in her writing, as well as her willingness to co-author articles in which her graduate students are first authors (18 of her articles were first authored by former students or post-doctoral scholars).

Research: Professor Davis is a leading science educator and teacher educator whose research interests include teacher and student learning. Some particular interests include beginning and experienced elementary teachers, teachers learning to engage in ambitious science teaching, and the roles of curriculum materials and teacher education in promoting teacher learning.

Professor Davis' research is organized around three distinct but interrelated themes. First, she investigates the design features of educative curriculum materials in elementary science; these are curriculum materials that serve an educational purpose for the teachers who use them. Second, she investigates how elementary teachers use and learn from these educative curriculum materials. Third, she investigates programmatic and instructional features of initial teacher education for elementary teachers, particularly in science education.

Professor Davis carries out a program of research on science teaching that pays particular attention to educative curricula. Her work starts from the assumption, grounded in the literature, that teachers adapt, rather than merely enact, curriculum materials; the construction of the enacted curriculum thus can benefit from the presence of features that can scaffold how teachers adapt those materials. Her research explores that assumption in several ways. First, she has studied the educative curriculum materials themselves, identifying those features that make them educative for teachers. Second, she has studied teachers' learning from curriculum materials, describing their work adapting curriculum materials by tracing their use of the educative features included with those materials. Third, in the context of her teacher education work, she has studied how preservice and novice teachers develop the capacity to design materials for science instruction.

Professor Davis' research draws on a variety of methodological approaches. Her earlier work can be described as design research, but she has also used case studies and quasi-experimental design. Her research draws from theories of teacher knowledge and teacher learning that blend cognitive and situated, practice-based perspectives.

Professor Davis has been productive in the years since her promotion to associate professor. Since 2006, she has published 21 journal articles, of which she has been the first author of four. Her articles appear in highly reputed outlets including *Educational Researcher*, *Review of Educational Research*, *Journal of the Learning Sciences*, *Harvard Educational Review*, *Journal of Research in Science Teaching*, *Curriculum Inquiry*, and *Teaching and Teacher Education*, among others. This record adds to her publication record before promotion yielding a total of 33 articles, for which she has been the first or sole author of 14. Additionally, Professor Davis has written five book chapters since her promotion. Of these, one is an encyclopedia entry and two are handbook chapters.

Professor Davis has consistently presented her work at highly regarded research conferences such as the annual meetings of the American Educational Research Association (AERA) and NARST. She has given invited talks at the National Science Foundation (NSF), the National Academy of Science, the American Association of Colleges of Teacher Education (AACTE), and a number of peer universities here and abroad.

Professor Davis has been successful in garnering grants to fund her research. Over the years at Michigan, she has been the principal investigator for federal grants that totaled more than \$2 million.

She has also been a co-principal investigator on at least three more NSF grants for which the University of Michigan was a subcontractor. Professor Davis has attracted small internal grants as well. Overall, Professor Davis presents a productive record of influential research and scholarship.

Recent and Signification Publications:

- Davis, E. A., Palincsar, A. S., Arias, A., Bismack, A., Marulis, L., & Iwashyna, S. (2014). Designing educative curriculum materials: A theoretically and empirically driven process. *Harvard Educational Review*, 84(1), 24-52.
- Davis, E. A., Beyer, C., Forbes, C., & Stevens, S. (2011). Understanding pedagogical design capacity through teachers' narratives. *Teaching and Teacher Education*, 27(4), 797-810.
- Beyer, C., & Davis, E. A. (2009). Using educative curriculum materials to support preservice elementary teachers' curricular planning: A comparison between two different forms of support. *Curriculum Inquiry*, 39(5), 679-703.
- Davis, E. A., & Smithey, J. (2009). Beginning teachers moving toward effective elementary science teaching. *Science Education*, 93(4), 745-770.
- Davis, E. A., Petish, D., & Smithey, J. (2006). Challenges new science teachers face. *Review of Educational Research*, 76(4), 607-651.
- Davis, E. A., & Krajcik, J. (2005). Designing educative curriculum materials to promote teacher learning. *Educational Researcher*, 34(3), 3-14.

Service: Professor Davis has an impressive record of service both to the profession and the University of Michigan. She currently co-chairs the NARST special writing committee to develop a position statement focused on curriculum materials for the implementation of the Next Generation Science Standards and is a member of the National Research Council's committee on Strengthening K-12 Science Education through a Teacher Learning Continuum. She was a primary reviewer of the Next Generation Science Standards. Between 2008 and 2011 she was a member of the Board of Directors of NARST, co-chair of its External Policy and Relations Committee, and co-chair of a NARST ad hoc committee to review a framework for the new national science education standards. She has also been a member of advisory boards for various funded projects.

Professor Davis' service contributions to the field of educational research include four years as co-editor of the prestigious *Elementary School Journal*. She also serves or has served on the editorial boards of the *Journal of the Learning Sciences*, *Journal of Research in Science Teaching*, and *Journal of Technology and Teacher Education* and she has been an ad hoc reviewer for 12 other journals covering the fields of science, education, and psychology.

Professor Davis's record of service to the University of Michigan includes membership on the Academic Advisory Committee of the Matthei Botanical Gardens and Nichols Arboretum since 2005. She has also been active in the Center for the Education of Women. At the School of Education, she has been a key member of the Teacher Education Initiative that produced a reform of the school's elementary teacher education programs. Most importantly, from 2010 to 2014 she was chair of the elementary teacher education program, in charge of the academic leadership of two teacher education programs, and a member and rotating chair of the Teacher Education Cabinet that provides leadership for the teacher education programs. Additionally, between 2010 and 2013, Professor Davis was the chair of the Elementary Curriculum Design Group, constituted of faculty and staff who worked on program design, instruction, and assessment. In her role as chair of the elementary teacher education program, she served as an ex officio member of the School of Education Executive Committee between 2011 and 2014. Before becoming chair of elementary education, Professor Davis was an elected member of the school's Executive Committee for three

years and an elected member of the Executive Committee of the Educational Studies program for two periods.

External Reviewers:

Reviewer A: “Something that ... may be her most important contribution, is her role in developing elementary science teacher education as a domain for scholarly inquiry. When she entered the field in 1998, publications in this field consisted mostly of surveys and opportunistic one-shot studies of methods classes. She and a small group of colleagues at other universities pioneered programmatic research in this field, and her graduate students have continued to contribute.”

Reviewer B: “It is also evident from Dr. Davis’ record that she is a strong collaborator who can help envision and pull off large-scale R&D projects. . . . Dr. Davis has a strong reputation as a research collaborator . . . She also has a very strong reputation as being an excellent advisor—which is also evident in her co-authored publications with students.”

Reviewer C: “One strength of Betsy’s research that stands out is its programmatic nature. She has identified several concepts that have important implications for teacher education and curriculum development, and has explored these concepts in multiple studies using a range of research designs and analytic tools. The impact of this work is truly an example of the whole being greater than the sum of the parts. Considered together, the studies provide theoretical insights about educative curriculum materials and pedagogical design capacity, and practical implications for enhancing curriculum materials and improving teachers’ ability to adapt materials to meet their learning goals and the needs and abilities of their students.”

Reviewer D: “The scholarly record for Dr. Davis is, in a word, exemplary. The accomplishments in grants, publications, and mentoring of doctoral students are extensive and impressive. Her work reflects strong programs of research in preservice elementary teacher education and in the development of educative curriculum. . . . A noteworthy piece of evidence for excellence in scholarship is Dr. Davis being appointed to the National Research Council synthesis study committee on *Strengthening K-12 Science Education through a Teacher Learning Continuum*. The appointment is recognition of her standing and status in the field of science teacher education.”

Reviewer E: “I believe that Dr. Davis’s [sic] record warrants promotion to Full Professor. Since her promotion to Associate Professor, she has continued to be a productive scholar, extending and deepening her earlier work in important ways. Her research is deeply programmatic and has made significant contributions to the field of science education and increasingly to the field of teacher education as well.”

Reviewer F: “Professor Davis is a top-flight talent with a flair for innovation that is coupled with painstaking attention to the conduct of empirical investigations of teacher and of student learning. As to comparisons with other scholars of similar tenure, I confess to trying to entice her to come to this University as an endowed chair in teacher education. Unfortunately, she declined to consider the position, but I couldn’t imagine then, or now, anyone at the intersection of science education and teacher education who would be more suitable.”

Reviewer G: “The journals to which she submits her work and that publish the work are of uniform high quality. She has published in flagship journals serving a broad audience of education scholars (*Review of Educational Research, Educational Researcher, Harvard Education Review*), highly regarded journals in science education research and the learning sciences (*Science Education,*

Journal of Research in Science Education, Journal of the Learning Sciences), and journals in teacher education research and curriculum studies (*Journal of Science Teacher Education, Teaching and Teacher Education, Curriculum Inquiry*). Her strategic approach to where she publishes her work has certainly influenced her impact on the field.”

Reviewer H: “It is not always easy to evaluate whether faculty members from other universities would meet the requirements for promotion at In this case, it’s a breeze. I would not hesitate to predict that Professor Davis would meet the requirements for Professor at ... ; indeed, we would be delighted to have her here.”

Reviewer I: “I believe that Dr. Davis’ work is comparable to several other scholars in the field who have recently received promotion to the rank of Professor at their institutions ... Were Dr. Davis up for promotion to the rank of Professor at my institution, I would certainly vote in favor.”

Reviewer J: “Dr. Davis has created a strong case, empirically justified and theoretically grounded, that ambitious teaching is within the grasp of elementary teachers who have access to the right tools and to a vision of instructional excellence. Dr. Davis has played a leading role in shaping both on the national and international stage.”

Reviewer K: “Much of Dr. Davis’ empirical work in science teacher education results from an iterative revision process in her elementary science methods course to pilot instructional innovations (e.g., features of educative curriculum materials, modeling, explanation building) grounded in cutting edge research and/or contemporary theoretical perspectives. Through her intentional research–practice connections, Elizabeth shapes the field, as well as informs science teacher educators about practices that lead to the improvement of science teaching in the early grades.”

Summary of Recommendation: Professor Davis is a productive, nationally recognized scholar and researcher in science teacher education, with her work being appreciated by scholars in several contiguous areas. Her scholarship, evident in her publications and grants, has been praised as programmatic and innovative. She is an accomplished teacher with serious work at the undergraduate and doctoral levels. Her service to the field of science education and in particular to the School of Education is outstanding. It is with the support of the School of Education’s Executive Committee and Promotion and Tenure Committee that I recommend Elizabeth A. Davis for promotion to professor of education, with tenure, School of Education.



Deborah Loewenberg Ball
William H. Payne Collegiate Professor of Education,
Arthur F. Thurnau Professor, and Dean
School of Education

May 2015