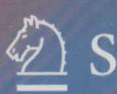
Nathaniel L. Gage

A Conception of Teaching



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To Maggie

Since March 10, 1940

Professor Nathaniel L. Gage
1917–2008

Photo credit: Chuck Painter/Stanford News Service

Tribute

"This is an important book by the top scholar on research on teaching. As always, Professor Gage has much to say–and he says it well."

Tom Good
Professor of Education, University of Arizona

"The scope and import of N. L. Gage's scholarship is easily documented. Others have described this. Less tangible or apparent is his impact on those who had the immeasurable good fortune to enjoy his mentorship. He modeled devotion to the disciplines of scholarship – a never satisfied striving toward thoroughness, dedication to clarity especially about methodologies that color interpretations, insistence on clarifying foggy arguments, and commitment to stimulating rather than disparaging other scholars' thinking. His extraordinarily high expectations blended naturally with gentleness in corrections and patience in explaining not just what was the case but how a case came to be the case. These qualities were all the more special in the context of almost always being much too near a deadline. Like other superb mentors, Nate taught students and colleagues a very great deal about educational psychology. More significantly, he led us to learn and prize the ethic of scholarship."

Phil Winne
Professor & Canada Research Chair, Simon Fraser University

"Besides being a superb scholar and an exacting editor, Nate Gage was a consummate gentleman of the old school. I remember a meeting of the "Invisible College" at Syracuse University in the early 1980s. Nate was reporting on the procedures he had used in his planning and preparation for the National Institute of Education's 1974 Conference on Studies in Teaching, which he chaired. He showed a slide of a chalkboard used during the planning process. On the chalkboard he had listed the ten panels that were to make up the conference, along with the chairs and members of each panel. I was struck by the fact that all the male participants were identified by last name only, while the female participants were identified by both first and last name. Given the concerns about gender equity of that time period, I wondered if this could be an instance of sexism. But when I asked him to explain the difference in recording of the names, he said that he thought it would be rude to refer to women by their last name only. He clearly cared about issues of gender

equity. When Ann Lieberman and I organized a special workshop on problems of two-career marriages at a later AERA conference, Nate attended, and confessed to the assembled group that he felt guilty about the ways that he had probably inhibited Maggie, his dear wife, from exploring her own career possibilities. He knew that his early views on the role of women were constrained by the social expectations of that period, and he really worked at understanding and accepting the newer perceptions of appropriate roles. The number of women scholars who served as members of the NIE panels reflected that new understanding. His chalkboard notes demonstrated how his early views of appropriate ways of addressing women were incorporated into his newer views of appropriate roles for women. I have long cherished the memory of that chalkboard image. For me, it captures one of the ways Nate's personal beliefs contributed to his professional relationships."

Greta Morine-Dershimer
Emeritus Professor of Education, University of Virginia

"I met Nate Gage in August of 1974. I was a newly admitted doctoral student in educational psychology at Stanford University, and Nate was my academic advisor. We sat together in Cubberly Library reviewing my resume, and he asked me how I came to know my previous employer who had written a letter of recommendation for my file. I told him that Bob Baker's daughter was my best friend in high school and after we graduated college, and Bob asked if I would like to come to California and work in his research lab. Nate responded with a chuckle, and said with a twinkle in his eye, "Well, you must have impressed him in some other way because he could not write a letter like this otherwise." Nate still had this same, warmly playful spirit the last time I saw him as well. Almost exactly 33 years later, in August of 2007, Nate appeared unexpectedly, walking down the aisle with his assistant, at my outgoing address as the president of Division 15 (Educational Psychology) of the American Psychological Association. I was so moved that he would make the effort at 90 plus years of age to come to San Francisco to hear me speak that I had to take a moment, pause, and introduce him to the many younger faces in the audience. That same twinkle was there in his eye then, and the last thing he said to me as he left the reception afterward was, "Baby girl, you did me proud." Perhaps the most meaningful thing I can say about Nate Gage is simply that *he was there for me* throughout my career."

Lyn Corno
Teachers College, Columbia University

NATE GAGE: A MAN FOR ALL SEASONS

"Although Nate was known as a psychologist, his work encompassed much more – some philosophy of education, some history of education, some sociology of education. All aspects were brought to bear in his attempt to create a theory of teaching that was both rigorous and based on empirical evidence. It was his quest for empirical evidence that brought us together. Nate joined the Stanford faculty in 1962, a year after I arrived. We often discussed some of the research questions in education. He posed a problem that often plagued social scientists, namely, that although there may be numerous studies on a particular subject, the evidence from

any single study may not be convincing. This might be due to small sample sizes (often the case in dissertations), or there may be heterogeneity in the data. However, the composite of the studies seem to point in one direction. Nate's question was whether this disparate evidence could be combined in a statistically rigorous way so as to yield a convincing conclusion. Statistical methods for combining the results of independent studies have been called meta-analysis, and Nate's question was a catalyst for me to begin working on the development of statistical methods for the analysis of such data.

Nate had a kind sense of humor. He had a number of sentences that he liked and which he would repeat. One such would come out at faculty meetings after I would make some comment involving numbers. Nate would say, "Ingram, you know that you are no good with numbers." This was also said when we had to check the bill at a restaurant.

For the last 45 years Nate has been a friend, a colleague, and an intellectual stimulus. Most recently, he expressed concern that the education community recognize that teaching had a scientific foundation. This book represents his legacy in showing that such a foundation exists."

INGRAM OLKIN
PROFESSOR OF STATISTICS AND EDUCATION, STANFORD UNIVERSITY

"When I first met Nate Gage in 1972, he was described as the "father of research on teaching." I didn't quite know what that meant at the time, being a new staff member at the National Institute of Education, just completing my dissertation on students' achievement motivation. I soon learned. Nate Gage worked relentlessly on developing and sustaining research on teaching and bringing to it the prestige required to be accepted as an educational research field. Nate's strong focus on research on teaching, its concept, conduct, power, and use continued throughout his lifetime. He was a humble man: one who never placed himself in front of the pack, and would converse with anyone—young or older academics, school people, politicians—with respect and grace. His knowledge of the field was simply remarkable. He was, indeed, the Father of Research on Teaching, and will be sorely missed."

VIRGINIA RICHARDSON
PROFESSOR OF EDUCATION EMERITA, UNIVERSITY OF MICHIGAN

"Nate was a mentor and safe harbor during my graduate student days at Stanford (1968-1970) and then a colleague and good friend throughout the remainder of his career. Many memories come flooding back, but two stand out as a graduate student and are still vivid. The first memory is that of a big fight Nate and I got into at a meeting of the Psychological Studies in Education faculty. He was a chaired professor; I was a graduate student representative. The fight was whether psychological principles were general or subject-matter specific. Nate held the former view and I held the latter. We got into a real match... so much so that Lee Cronbach caught up with me after the meeting saying that it was apparent that senior faculty as well as graduate students could make fools of themselves! The "debate" was quickly forgotten and had no bearing on Nate as a mentor and friend.

The second memory is of Nate at home. Nate and Maggie often invited graduate students over for wine, cheese, and conversation. On one such occasion I learned that Nate was on volume Q of the Encyclopedia Britannica. Nate was reading the encyclopedia from A to Z, no doubt editing as he went along!

Two memories of Nate stand out as a colleague. The first: I had written a paper to present at a conference and asked Nate to read it. He did, editing copiously as was his want. He allowed as how it was a good paper but wasn't ready for publication. I told him I didn't plan to publish the paper. He told me that he never wrote a paper he didn't intend to publish and that stuck with me throughout my career... inhibiting some writing, but, alas, not enough! The second: While I was dean at the Stanford University School of Education (1995-2000), a retired Nate came to talk to me—Nate was working for me, no longer vice versa! He was concerned about finding funding for his next project... a book integrating research on teaching and research on instruction. I suggested he apply for a small grant from the Spencer Foundation. He did so and received funding. He came to my office to report the grant with a smile that made the Cheshire cat look as if it were pouting. And best of all for Nate, his receiving this grant meant he was still in close competition with his brother who, like Nate, was famous in his own field. As fate would have it, our paths crossed in mysterious ways. Nate held the Margaret Jacks chair in Education; I now hold that chair... and it feels good that Nate sat in it as well."

RICHARD J. SHAVELSON
MARGARET JACKS PROFESSOR OF EDUCATION, STANFORD UNIVERSITY

"Good philosophical training cultivates a skeptical eye, and good philosophical training in education often uses educational research to train one's skeptical eye. When I first began to read Nate Gage, I presumed his work would be grist of the mill for my newly cultivated skepticism. Instead, something quite different happened. I realized that his work was "really good stuff," and if I was going to critique it I would have to work very hard. Thus began nearly three decades of back-and-forth exchanges between us that I know were far more beneficial to me than they were for Nate."

GARY D. FENSTERMACHER
PROFESSOR OF EDUCATION EMERITUS, UNIVERSITY OF MICHIGAN

Preface

The only Theory that can be proposed and ever will be proposed that absolutely will remain inviolate for decades, certainly centuries, is a Theory that is not testable. All Theories are wrong. One doesn't ask about Theories, can I show that they are wrong or can I show that they are right, but rather one asks, how much of the empirical realm can it handle and how must it be modified and changed as it matures? (Festinger, 1999, p. 383)

If the history of science proves anything, it is that all Theories prove eventually to be wrong (even if "wrong" only means incomplete or standing in need of elaboration). (Phillips, in Phillips & Burbules, 2000, p. 31)

A word about gender: For millennia, all people, including females, were referred to as "he." I recognize that times have changed by referring to all teachers as "she." Male teachers should accept the error as a compensation for the earlier one.

Acknowledgments

My first three years of work on this book were supported by a small research grant from The Spencer Foundation, which I wholeheartedly thank. For the whole work, the data presented, the statements made, and the views expressed are solely my responsibility. I am, of course, thankful to the scholars and research workers on whose work I have drawn, as noted in the text and list of References. Without the products of their work, especially those of the last half-century, when research on teaching began to flourish, this work would have been impossible.

Professor S. Alan Cohen of the University of San Francisco generously made available to me various publications and other materials that greatly facilitated my becoming informed on the concept of instructional alignment. Several Stanford colleagues answered my queries related to their specialties: Professor Denis C. Phillips, on philosophy of science; Professor Ingram Olkin, on meta-analysis; Professor Decker Walker, on instructional design. The late Professor Kenneth Sirotnik of the University of Washington was altogether cooperative in giving me information about "A Study of Schools," the tour de force led by John Goodlad.

Janet Rutherford, my superb administrative assistant, saved me from months of wandering in the stacks of the Stanford libraries, solved problems with my computer, and provided much highly intelligent general helpfulness. Barbara Celone and Kelly Roll, of Stanford's Cubberley Education Library, and Mary-Louise Munill, of the Interlibrary-Borrowing Services of the Stanford Libraries, obtained many books and articles and, in doing so, occasionally performed seeming miracles.

Dean Richard Shavelson and, later, Dean Deborah Stipek, of Stanford's School of Education, helped me by acting on their faith that, although I was retired, I was making appropriate use of a Stanford University office.

Professors David C. Berliner of Arizona State University, Barak Rosenshine of the University of Illinois, and Raymond L. Debus of the University of Sydney, have been friends of the kind that every author needs. I am immensely grateful for their long-term friendship, encouragement, and criticism. The editorial work of Cynthia Haven saved me from awkwardnesses and obscurities.

Finally, the love and support of my late wife, Margaret, and our children – Elizabeth, Tom, Sarah, and Anne – have kept me steady over the years.

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Chapter 1
An Agenda

After everything else has been done and provided – the money raised; the schools erected; the curricula developed; the administrators, supervisors, and teachers trained; the parents and other citizens consulted – we come to teaching, where all of it makes contact with students, and the teacher influences students' knowledge, understanding, appreciations, and attitudes in what we hope will be desirable ways. Teaching is well-nigh the point of the whole educational enterprise and establishment aimed at producing student learning.

Teaching is also important in terms of a kind of ethical imperative. Nations require that their young people have frequent contact, for long periods, with adults called teachers. When such a relationship is legally imposed on young people, it seems only fair that society should do whatever it can to make that relationship a beneficial one.

The literature of the behavioral and social sciences is full of conceptions and research on learning and memory. Teaching is comparatively a stepchild, neglected by those who have built a formidable body of conceptions of learning and memory. The uses of learning conceptions for teaching constitute a tool-kit that has been left to rust. It is as if the theoretical work of, say, Faraday, had never given birth to the tremendous applications of electrical energy so that when Einstein turned on his lamp, he could read his notes. This book seeks to give teaching the kind of attention that learning and memory have received. Teaching is where learning and memory conceptions should pay off.

Finally, teaching is worth studying simply because of the intrinsic interest of the phenomena to which teaching gives rise. Even if such research had no practical value, it would be worthwhile for the same reasons that astronomy and archaeology are worthwhile. As part of our universe and our human condition, teaching cries out to be studied and understood.

Conceptions are both the guide and the outcome of research, including research on teaching. Research is the process of seeking relationships between variables. That simple definition applies to any science, whether it is in the natural or the behavioral sciences. To explain, we search for logical relationships; e.g., if time is indispensable for learning, lack of time prevents learning. To predict, we search for temporal relationships; e.g., knowing a teacher's high school grade-point average, we can predict with better than chance accuracy, her grade-point average as a college freshman. To control or improve, we search for causal relationships; e.g., knowing that teachers who receive training in question-asking do better than similar teachers

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