

The adventures of John Bransford: In memoriam

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To cite this article: Cindy E. Hmelo-Silver, Brigid Barron, Nathalie Coté, Daniel Hickey, Xiaodong Lin, Mitchell Nathan, Na'ilah Nasir, Kieran O'Mahony, Roy Pea, William Penuel, Jeremy Roschelle, Nora Sabelli, Daniel Schwartz, Diana Sharp & Sashank Varma (2023) The adventures of John Bransford: In memoriam, *Journal of the Learning Sciences*, 32:3, 477-485, DOI: [10.1080/10508406.2023.2219202](https://doi.org/10.1080/10508406.2023.2219202)

To link to this article: <https://doi.org/10.1080/10508406.2023.2219202>



Published online: 01 Aug 2023.



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The adventures of John Bransford: In memoriam

We have lost one of the pioneers of the learning sciences: Dr. John Bransford passed away on April, 11, 2022 at the age of 78. His empirical and theoretical writings made contributions to basic cognitive psychology and were foundational for the applied cognitive research that became the learning sciences. Although his most recognized contribution may be the NRC policy report *How People Learn* (Bransford et al., 2000), he was also one of the many scholars that instigated the cognitive revolution with his brilliant experiments carried out in the early part of his career (Baars, 1986). Bransford received his PhD in cognitive psychology at the University of Minnesota in 1970. He dedicated his life to understanding and improving human learning and education. Beyond his intellectual contributions, John Bransford was a cherished mentor and collaborator. We invited colleagues from various stages of Bransford's career to contribute memories of the times they shared with him. In this brief essay we summarize a few of his key contributions and offer reflections on his incredibly generous and generative orientation to the work that we all engaged in as well as the deeper values that all of us hope to carry on in our own careers.

Contributions to cognitive psychology: Setting the stage

John Bransford was a key figure in psychology's transition from behaviorism to cognitivism. His ingenious experiments showed the critical role of prior knowledge in text comprehension, elegantly demonstrating the constructive nature of understanding and learning (Bransford et al., 1972). For example, in a classic experiment, participants were asked to read paragraphs that were quite challenging to comprehend, until they were given some information that cued their prior knowledge (Bransford & Johnson, 1972). In another series of experiments Bransford and colleagues explored the phenomenon of transfer-appropriate processing (Adams et al., 1988; Perfetto et al., 1983) and found that when information was given in a problem-solving context, it was more likely to be used when needed than if it was just presented as straight facts. He became concerned with the problem of inert knowledge and why people often failed to access what they had learned in potentially relevant

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

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situations (Bransford et al., 1989). These studies set the foundations for dedicating his career to applied research and design in education, orienting him to the question of how best to prepare students to learn, an inquiry he framed early (Bransford, 1979) and pursued collaboratively, culminating in the generative framework we now know as Preparation for Future Learning (Bransford & Schwartz, 1999).

Creative collaborations

John truly saw creative thinking as a practice that could be cultivated, as immortalized in J. D. Bransford and Stein's (1984) book, *The Ideal Problem Solver*, and many of us found him to be one of the most creative leaders we have ever had the pleasure to know and work with. Throughout his career in bringing the insights of cognitive psychology to bear on informing the innovative design of interactive multimedia learning environments, John Bransford had the extremely distinctive talent for building exceptional interdisciplinary teams. He established immensely productive creative projects in which his collaboration and mentoring gifts were manifest to his colleagues, graduate students, and collaborators from education, industry, policy, and publishing. These influential enterprises included the Learning Technology Center and its Cognition and Technology group at Vanderbilt (CTGV), the Center for Innovative Learning Technologies (Pea et al., 1999), and the NSF funded Science of Learning LIFE Center (Learning in Informal and Formal Environments: Bransford et al., 2006; Bransford et al., 2006).

One of his early and highly generative collaborations involved the development of the Cognition and Technology Group at Vanderbilt (CTGV). With support from the Dean of Peabody College, John established the Learning Technology Center (LTC) in 1984. The Center attracted graduate students from across the university and grew from 7 people in 1984 to approximately 100 by 1999, with expertise spanning special education, cognitive science, assessment, teacher education, and instructional design. Publishing under a group name as well as in smaller subgroups, John and his collaborators were prolific contributors to not only high-quality and high-impact scientific research in the learning and cognitive sciences, but to the design, creation and implementation of landmark learning technologies serving as lighthouses for the ambitions of several generations of budding learning scientists, and education system and policy partnerships that had significant consequences. During that time, Bransford and his colleagues developed and tested a number of innovative computer, videodisc, CD-ROM, and Internet programs for mathematics, science, and literacy.

These innovations included the Anchored Instruction instructional design model, developed in the social constructivist paradigm—a technology-augmented learning approach emphasizing problem solving within an

integrated learning context involving real world features. This approach was exemplified in the interactive videodisc series, *The Adventures of Jasper Woodbury*, and the multimedia *Little Planet Literacy Series*. Anchored instruction was grounded in a set of design principles aligned with Bransford's pioneering insights about the role of prior knowledge in comprehension, the value of narrative for building mental models, the importance of problem generation, and the need to intentionally seed opportunities for transfer. Bransford recognized that students could not learn complex problem solving at school without solid prior knowledge to help ground their problem solving AND when they were given the opportunity to both define and solve problems. To develop these opportunities, Bransford leveraged the latest technologies for interactive video to build up a series of interconnected problem-solving experiences mapped to core content standards. Often these storylines positioned students as helpers and solution generators for others, reflecting John's belief that learning environments can be more motivating for children when connected to community ventures reflecting altruism and kindness, while also resembling conditions that help people become experts (Barron et al., 1998).

Beyond leading visionary work integrating cognitive principles into the design of learning technologies, Bransford led a influential policy-focused publication that synthesized research on learning and cognition for educators. Drawing on findings from a variety of disciplines including cognitive psychology, neuroscience, and anthropology, the report "The How People Learn Framework" suggests four lenses useful in any classroom situation—that learning environments need to be simultaneously knowledge-centered, learner-centered, assessment-centered, and community centered (Bransford et al., 2000). This landmark report, too, was a collaborative venture—more than a dozen leading scholars contributed to this multi-year synthetic effort. The report mainly focused on classroom learning, but began to signal the importance of understanding learning at multiple scales from neuroscience to lifelong learning beyond schools and classrooms. This more encompassing vision would be taken up in a final field-building effort bringing together old friends and new colleagues.

In his final and most theoretically expansive effort, Bransford served as the Founding Director of The Learning in Informal and Formal Environments (LIFE) Center, one of NSF's Science of Learning Centers, based in University of Washington, Stanford, and SRI International. As Principal Investigator on this 10-year, \$50 million experimental design, John's biggest idea was that of collaboration and co-creation, leveraging and orchestrating the possibility of conceptual collisions in service of interdisciplinary progress theorizing the social foundations of learning. The LIFE Center (Bransford et al., 2006; Bransford et al., 2006) sought to understand and advance human learning through a simultaneous focus on implicit,

informal, and formal learning, cultivating generalizable interdisciplinary theories that could guide the design of effective new technologies and learning environments both in and out of school and across the life span. Beyond a focus on time and place, or life-wide and life-long learning, the LIFE center work pointed to the importance of understanding learning as “life deep” – and deeply grounded in value systems operating in society—frequently in implicit ways and influenced by the social values that guide what people believe, how they act, and how they judge themselves and others. This emphasis returns to the importance of John not only as a scholar, but as a valued colleague whose generosity of spirit has left a generative legacy for those who were fortunate enough to know him as a mentor, teacher, and collaborator.

Generous and constructive orientation to the work

One of the most frequent words used to describe John in our collective reflections was “generous.” He was generous with his time, with his presence, as he listened extremely well to others, and with seeing the seed or potential in the ideas of others with whom he was working. John’s intellectual style privileged the power of positive thinking, always seeking to find the generative contributions in a study, theory, or line of research, rather than foregrounding the easier path of critique without constructive orientation. He would exemplify this trait in Vanderbilt groups with faculty, postdocs, and graduate students as they were reading together empirical publications about studies of learning or teaching. Rather than focusing energies on the paper to find and emphasize its methodological flaws or lack of clarity, John would turn around the group’s attention and challenge them to find the gems in every paper, and model this orientation by asking: What is it about this paper or study that has made a *contribution* to our understanding of the science of learning and human behavior? His former students and colleagues found that John’s accentuation of the positive continued to guide their own academic work as reviewers, mentors, and authors.

John was the quintessential collaborator. He lifted up the ideas of others and had a unique vision for both the kinds of collaborations that were possible (what kind of people could productively be in a room together), and for what collaboration needed to feel like. An important part of that was a lack of hierarchy, a deep respect for group processes, and an appreciation for diverse forms of expertise. We were often struck by John’s capacity during creative brainstorming to be incredibly intellectually generous in sharing insights and by mirroring and expanding the contributions of others at the table. It felt good when John revoiced your ideas, weaving them together with his own and in the process creating a new line of thinking and opportunity for generative design. At the LTC, many collaborative

efforts tapped into the creative talents of local writers, artists, family members, teachers and dedicated staff. Although idea-amplifying brainstorming sessions were often free-form he also gently engineered conversations to capitalize on fresh perspectives and to question assumptions. John brought problem-identification to center stage, often starting a group conversation by asking: “So what is the problem? Why is it important?” He would then invite contributions of prior knowledge—“What do we know or not know about it?” and then move on to ask, “Do we have the means to research or to solve the problem?” “If not, how can we get them.?” Throughout his career he positioned practitioners’ ideas as ones that were necessary to help advance researchers’ thinking. For example, in describing how a research practice partnership between University of Washington and the Bellevue school system came to be, John would always cast himself as both the person the district was seeking out, but also as someone who was often mistaken about what would be a valuable direction for the collaboration to pursue.

John was a deeply valued thought partner. He created a welcoming space for sharing newly-formed ideas and these conversations were opportunities for synergy. Former students and colleagues alike appreciated how John was genuinely curious about their work as students or early career scholars, in that he would actively think with them about how their work could be connected to his own program of research, presumably in his hopes for the ultimate betterment of both. John was a deep listener. He had the ability to listen for a few minutes, and like a razor, cut straight to the core of a matter, paring away the details that could derail a graduate student. We remember him asking transformational questions in key moments that opened unrealized possibilities and made space for new ideas to come forward. Many of his students considered his advising about their research unique because he was so creative in helping them turn their problems with research or teaching into golden opportunities. In one example, poor teaching ratings for a former student was yet another problem to solve for John. One particular question he asked was: “Why are you putting such great emphasis on things that students don’t value, such as effort, reading beyond what was requested . . . etc.” His former mentee answered that education did not come easily as a child as I was unable to attend school from when I was 9 years old until I was 15, due to the Cultural Revolution. John’s eyes lit up, and he said: “Oh, I have an idea; see how you like it. Why don’t you make a short movie, no more than 3 minutes, about your life struggles and why you have certain values and beliefs due to these struggles. Tell the students the story behind the story.” Such a video was created, and the next semester it was shown to the class. The course received an average rating of 4.5/5 for the same course content and instructional style used before. John was excited by the outcome. He said “design an experiment, run it, and prove scientifically that knowing people’s struggles can impact students’ learning and cognition.” The

collaborative study was run and published (Lin & Bransford, 2010), and this line of thinking has been the major theme of Lin's research ever since.

John embodied the principle that sometimes what is necessary for creativity is a new angle, a fresh perspective, and the need to problematize that which was taken-for-granted. For example, John Bransford and his team worked during 2004–2007 as a learning sciences team to collaborate with top Microsoft game developers to create new educational software for young children in literacy. Initially, the game designers interpreted their initial explanations and goals differently than what the research team intended, based on their own experiences of and expertise about why games were fun. John transformed this collaboration with a clever phrase embodying the strategy behind much of the work of the Learning Technology Center: *Reading-to-Do*. The talented game designers eventually came up with *ItzaBitza*, a game in which children read to discover what a character needs, so they could draw it and watch it “come to life.” The game won many accolades, and the lightbulb moment for the team happened when John came up with the short but brilliant phrase of *Reading-to-do* which gave the interdisciplinary team a shared vision, reflecting a sociocultural view of knowledge as a tool for thinking.

Beyond his intellectual contributions, John Bransford will be remembered and deeply missed for his personal warmth and kindness. During the very first week of graduate school, one of John's students had her bike stolen. She had been late to class and left the bike unlocked outside the Psychology Department. Parking at Vanderbilt was terrible, so even though she had an old car, the loss of the bike for campus travel was a real blow. John saw her dismay and invited her to his house to borrow one of his family's bikes, expressing great warmth and generosity. As this same student became a young mother, John revealed other sides of his warmth and caring, coalescing into another profound level of support and encouragement as he championed the value of both career and family. In another example, John once used his endowed professor fund to pay for a writing psychologist to help a recent graduate work to overcome their writing anxiety and fear, with the successful outcome of sustained writing and publishing. More than one of us remembers John taking them seriously as a scholar, and taking care to warn them about situations or institutions that might or might not be healthy spaces for their work, conveying a sense of care for our academic resilience in the long term that has been deeply appreciated.

Lasting influence

By the numbers, John Bransford's influence is immense as his citations and numerous awards and honors show. He was honored with named chairs at both Vanderbilt University as Centennial Professor of Psychology and as

Shauna C. Larson Chair at University of Washington. He was a member of the National Academy of Education and received the Thorndike Award in 2001 from the American Psychological Association. The National Academy of Science in 2000 named him a Lifetime Associate as advisor to the Nation in matters of science, engineering, and health and he served on the Board of Advisors to the National Science Foundation's Division of Education and Human Resources. And of course, he co-chaired three National Academy of Science Panels on the Science of Learning which resulted in influential reports, most notably *How People Learn* (Bransford et al., 2000), a seminal work with a current count of more than 27,000 citations, translated into many languages. His writings and talks inspired researchers around the world to develop innovative research on learning, design, and technology.

John's ideas continue to influence much work in the learning sciences today—the contributors to this piece have noted many powerful ideas that affect how they teach and influence their research. John's ideas about leveraging what we know about expertise in designing learning environments for children of various ages has continued to influence our work—both professionally and personally. One of John's core ideas that one of us still uses in their teaching and research is the centrality of people knowledge in human memory. Similar to the importance of failure stories, providing personal stories that help bring in the human narrative surrounding the development of theories, big ideas, and research can support learning and understanding. Similarly, the Bransford and Schwartz (1999) work on transfer as preparation for future learning addresses the situated nature of transfer that has influenced several of us in our research. Dissertations and careers of work were inspired in hallway conversations with John. One former student remembers how John helped mesh an interest in medical problem solving with the work going on at the LTC, suggesting that she go check out this new instructional method they were using at medical school called problem-based learning, and this remains a key research focus. He encouraged another student to go beyond thinking about individuals in collaborative learning—an important idea that remains central in her research and in the learning sciences more broadly. His enthusiasm for connecting neuroscience insights to theories of teaching and learning helped spawn a new line of interactional work that continues to grow. Many of us use the idea of problem-centered challenge cycles as instructional design heuristics. One of us remembers John starting a meeting by asking “what if assessment were a gift,” a fertile question that has reframed how some of us are currently thinking about the importance of formative assessment and how artificial intelligence can be used to support learning.

John Bransford was a prolific scholar whose generative insights will catalyze research on learning for many years. Equally important are the lessons John has left for how to do the work. John encouraged us to find

the gems in our own and others' research, to capitalize on the failure stories of ourselves, and others, and to go beyond the academic research community to generate useful knowledge. As collaborators and former students we are grateful for having worked with him and to have this opportunity to remember his generous and kind spirit that nurtured the creativity and collaborative energies of everyone he came into contact with. Thank you, John!

Disclosure statement

No potential conflict of interest was reported by the author(s).

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