

## Mary P. Dolciani Award

The Mary P. Dolciani Award recognizes a pure or applied mathematician who is making a distinguished contribution to the mathematical education of K–16 students in the United States or Canada. The recipient will be actively contributing to math education at the time of the selection.

### Stan Yoshinobu

*University of Toronto*

Stan Yoshinobu earned his BA in mathematics from the University of California, San Diego in 1995 and his MA and PhD from UCLA, finishing in 2000. Stan worked as a research mathematician and published work in pure mathematics for a few years early in his career, but has focused his energies on mathematics education, pedagogy, and faculty development for the past 20 years. More than changing the nature of the mathematics we teach or the order and manner in which we teach it, Yoshinobu’s approach has been to improve mathematical education through promoting student-centered inquiry-based learning—fundamentally changing the three-way relationship between teachers, learners, and mathematical content. He has been awarded Educational Advancement Foundation (EAF), National Science Foundation (NSF), and other (including MAA) grant funding for creating the Academy of Inquiry-Based Learning (AIBL), developing transformational workshops for college mathematics faculty, mathematics teacher educators, and facilitators to run more workshops. In this way, Professor Yoshinobu has been crucial in propagating a broad and growing community of IBL practitioners who are reshaping modern mathematics pedagogy.

Stan Yoshinobu writes:

To me, inquiry-based learning or more generally teaching isn’t fundamentally about teaching techniques or skills. These are important and necessary of course, and I’m not trying to minimize them. I focus and work on them daily! But teaching techniques, skills, and practices serve a larger vision for education, where students are deeply engaged as explorers and doers.

In 2010, Stan became the founding Director of the Academy of Inquiry-Based Learning (AIBL).

From 2006 to 2021, he obtained approximately \$4M in grants to support and study IBL instruction and fund Inquiry Based Learning (IBL) workshops. His prolific “IBL Blog” sustains a tightly knit network of IBL leaders. He has posted at least 234 blog posts since 2011. A major pillar of the Academy

(AIBL) is that IBL raises and addresses concerns of equity and diversity. From the very beginning of AIBL in 2010, Stan's work argued for and instituted evidence-based research to expand understanding of best practices in IBL. Since 2003, he has presented numerous workshops, invited talks, and given conference & poster presentations on IBL instruction. He has extended IBL to projects for K–12 mathematics education, such as his work on mathematics curriculum development for at-risk children in grades 3–6 in San Luis Obispo, CA and his professional development for K–12 teachers to strengthen their mathematics content and inquiry-based teaching skills. This work offers high leverage, reaching teachers who then reach large numbers of students, and deploying higher education expertise to improve K–12 education as a public good. One nominator estimated that “In all, these workshops prepared 495 instructors to teach with more effective and equitable methods that reached over 22,000 students in the first year alone. A rigorous evaluation effort showed that instructors’ classroom behaviors changed in ways that can be tied to their gains of knowledge, skills, and supportive beliefs from attending an IBL workshop.” Stan Yoshinobu has played a central and pivotal role in IBL becoming a well-accepted pedagogical practice in mathematical education.

The work that Stan Yoshinobu and his Academy of Inquiry-Based Learning (AIBL) have done to rethink the nature of teaching has been so thoughtfully and inclusively developed and so practically and effectively disseminated that it has helped and will continue to help make great gains in K-16 mathematical education in the US. Just as the career of Mary P. Dolciani provided leadership to the mathematical community, Stan Yoshinobu's work serves as an important example of how teachers and scholars can have rich service lives that have an enormous impact on mathematical education. Perhaps one of the reasons that Stan has such breadth of service and has been so effective in influencing our community is due to his ability to be simultaneously optimistic and realistic, which makes him an enormously valuable leader for the IBL movement. For his creative and inspiring leadership, his unrelenting focus on equity and diversity in the mathematical community, and his huge, indeed, transformational impact on teachers and students in the US, Stan Yoshinobu is an inspiring choice for the 2023 Mary P. Dolciani Award.

## Response

I am deeply honored and humbled to receive this award. This is not what I ever expected for myself. The recipients of the Dolciani Award are people I have looked up to my whole career, who have achieved brilliantly in mathematics education. I read their papers and follow their example in my work and daily teaching. I am a team player and collaborator by nature, and I am extremely fortunate to have worked with so many talented, intelligent, and

thoughtful people. They have shaped my thinking and made me a better teacher, professional developer, and person. Huge thanks to Sandra Laursen and the Ethnography and Evaluation Research (E&ER) team, Matt Jones, Dana Ernst, Carol Schumacher, TJ Hitchman, the NSF PRODUCT team, Ed Parker, my PhD advisor John Garnett, and so many more. I have too many people to thank, and I wish I could list them all here. I was drawn to IBL teaching after learning about how students struggle to learn math well and how many are pushed out of STEM fields due to failing in math classes. I learned by reading books and articles in Math Education, talking to experts, and listening to students. These three sources of evidence resonated with my own experiences as a student and teacher. Quite simply, I wanted to understand and do a better job as an educator. When I finally tried to teach a version of IBL in a Real Analysis course for math majors in 2003, I realized there were so many new skills and practices I wish I had known about. I had been working in the summers in K-12 professional development at the time (as part of the California Math Project), and I thought to myself it would have been nice to be able to attend an IBL workshop. That would have made fall term easier! Then I learned that Jennifer Christian Smith, who was at the University of Texas at the time, had been conducting research based on Mike Starbird's Number Theory course, and crucially had video recorded the entire semester. From that point, I eventually developed the first version of the IBL workshop model. While the workshop has evolved over time, the root of it is a community of math instructors working to address the implementation obstacles we have identified in the field and from math education research. None of us get through life and career alone, and we all build off the ideas that are around us. We all need community and a handful of people in our lives who believe in us, sometimes before we believed in ourselves. The world is held together by those who care. One of my personal guiding principles is to try to build community directly or indirectly in the ways I can. In this way, more students, teachers, and colleagues have people around them who believe in them and each other. That makes the world a better place.

## Biographical Sketch

Stan is a teaching stream faculty member at the University of Toronto and Director of the Academy of Inquiry Based Learning. He has been teaching courses in undergraduate mathematics and mathematics education for more than 20 years using inquiry-based learning (IBL) and has organized IBL workshops since 2006 for college math faculty. Stan's scholarly interests include active learning, inquiry-based learning, professional development in higher education, and diversity, equity, and inclusion in education.