

Teaching Statement

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“Teaching and learning promote and enhance each other.”

—The Book of Rite, Warring States period.

This Chinese quote on teaching and learning reveals the mutual benefit between them. Although I read it as a teenager, not until 2014, when I first taught as an instructor, did I finally begin to better understand the nature and connections between teaching and learning. There are several key concepts, such as

- *motivation and inspiration*: as William Arthur Ward said “The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires.”;
- *engagement*, by, e.g., group discussion, asking and answering questions;
- systematical *training plans* and *course designs*, by organizing materials, setting appropriate homework assignments, quizzes, and tests;
- involvement of *student research projects* (, as my published my first paper as a junior student);
- and finally the cultivation in *active pursuing*.

For instance, teaching objects are no long restricted to course materials. Besides the basic definition, formulas, examples, etc., it is more important to foster a deeper understanding, to cultivate a self-independent learning, and to guide students with problem-solving skills. My ultimate goal is to cultivate the students necessary skills in problem solving, such as critical thinking and communication, and finally to guide the students into becoming self/independent math learners outside the classroom. TTo fulfill those goals, certain pedagogical strategies are applied.

1. Experiential teaching enriches the contents and activities in class. Besides traditional ones e.g., group discussion on problems with interactions, model tools, such as presentations on simulation demos, can catch the attention and stimulate students to further explore materials. Connecting a real-world problem to mathematical theory, not only encourages interdisciplinary learning for students; but also reveals the process of analyzing and solving real problems.
2. Research-driven teaching opens the door of higher-level research projects to undergraduate students. Some homework problems, especially in high level courses, are particularly selected. They are either directly from research projects or published papers, to offer the opportunity to the students participating certain projects; or are given in a literature review format, as the opening step to research topics. For example, presentation on topics related but beyond the teaching materials is one of such formats.
3. Ed-tech innovative teaching becomes increasingly a major part. The use of software such as Mathematica¹ and SageMath² is not restricted in presenting simulations and plots. Programming homework, dynamic notes, etc. always appear in my class.

1 Diverse and Abundant Experiences

Throughout all three institutes I have taught: Tulane University, Dalhousie University, and Duke Kunshan University, I experienced from private university, public university to the joint-venture liberal arts college. As shown in Appendix B, up to now, I have lectured (including current teaching ones)

¹<https://www.wolfram.com/mathematica/>

²<https://www.sagemath.org/>

- **23** sections, of 10 different regular math courses, including **various levels of calculus, linear algebra, probability, complex analysis, and number theory**, at three different institutes;
- **1 miniterm**, i.e., 1-week short course, and **5 independent study**, i.e., reading courses, for completely different topics, e.g., **combinatorics, analytic number theory, quantum computing, and algebraic geometry**.

In general, for basic math courses, e.g. calculus, linear algebra, probability and statistics, I have no preference, as all such courses are essential and important to students majoring in STEM. Meanwhile, as my research topics include several branches, such as combinatorics, (analytic and algebraic) number theory, etc., many advanced courses, e.g., complex analysis, abstract algebra, also fit my area perfectly. Take MATH301—Advanced Introduction to Probability at Duke Kunshan University (DKU) as an example. This course was designed by me upon my arrival at DKU. Many ingredients were taken into consideration, including but not restricted to the seven-week session structure at DKU, undergraduate curriculum, related major requirements, and other courses. The course serves as an elective in math major, and also consists of important materials for further courses, such as MATH405—Financial Mathematics. Some research topics, e.g., probabilistic methods, Shor’s algorithms in quantum computing are also introduced as the very end of the class.

2 Adjustment, Improvement, and Innovation

Teaching and learning is a dynamic process, so adjustment is required almost every single time. I am always willing to modify part of my teaching and adopt new already tested techniques into my course. This continuous adjustment encourages me to constantly reconsider the purpose and aims of the course and my teaching strategies. Moreover, comments on each course’s evaluation are also helpful for improvement. The current average of the overall score and some comments show that I am a “good teacher”; still, there is room and space to become a better instructor. In order to constantly improve my teaching, I am also engaged in many activities. For instance, I led two sessions by the Center for Teaching and Learning (CTL) of DKU, on the usage of MaxHub³, a digital whiteboard in hybrid teaching; and WeBWork⁴.

Also facilitated by the CTL, I was selected as one of the two instructors at DKU to conduct the Gradescope⁵ Research Project, awarded a grant of \$2,000. Gradescope is a digital grading system that allows instructors to scan and upload exams, and to grade them online. It reduces the grading time for classes of large size and digitizes the tests. Right now, I am selected as a member of Faculty Learning Community (FLC) 2022-2023, across all disciplines, to discuss and learn from each other in teaching.

Admittedly, there is always a distance from being a great teacher, and I am willing to constantly improve in teaching. As my experience grows, my teaching will be more effective, diverse, and innovative. My enthusiasm and commitment will never decrease.

Appendix

A TEACHING AWARDS

2022.12–2024.06	Faculty Learning Community Grant	Duke Kunshan University
2022.01–2022.12	Gradescope Research Project Grant	Gradescope
	Facilitated by Center for Teaching and Learning at Duke Kunshan University	
	Gradescope for math courses.	
2012–2013	Excellent Graduate Student Teacher	Math Dept., Tulane Univ.

³<https://www.maxhub.com/>

⁴<https://openwebwork.org/>

⁵<https://www.gradescope.com/>

B Teaching Experience

DUKE KUNSHAN UNIVERSITY

2023 Fall	MATH 105	Calculus
	MATH 202	Linear Algebra
	MATH 105	Calculus
2023 Spring	MATH 301	Advanced Introduction to Probability
	MATH 205	Probability and Statistics
	MINITERM 102	Experimental Mathematics and Symbolic Computation
2022 Fall	INDSTU 391	Introduction to Algebraic Geometry
	MATH 105	Calculus
	MATH 306	Number Theory
2022 Spring	MATH 301	Advanced Introduction to Probability
	INDSTU 391	Variational Quantum Algorithms
	MATH 201	Multivariable Calculus
2021 Fall	MATH 301	Advanced Introduction to Probability
	MATH 201	Multivariable Calculus
	MATH 105	Calculus
2021 Spring	INDSTU 391	Riemann Zeta-Function
	INDSTU 391	Quantum Algorithm
	MATH 306	Number Theory
2020 Fall	INDSTU 391	Combinatorics
	MATH 205	Probability and Statistics
	MATH 301	Advanced Introduction to Probability
2020 Spring	MATH 105	Calculus
	MATH 201	Multivariable Calculus

DALHOUSIE UNIVERSITY

2019 Summer	MATH 1030	Matrix Theory and Linear Algebra I
2019 Winter	MATH 3080	Introduction to Complex Variables

TULANE UNIVERSITY

2016 Spring	MATH 1060	Long Calculus II
2015 Fall	MATH 1310	Consolidated Calculus
2015 Spring	MATH 1210	Long Calculus I
2014 Summer	MATH 1160	Long Calculus II

C Sampled Course Syllabi and Evaluations