Teaching Statement

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As my family runs a business to improve K-15 education in China, I have an intrinsic passion and interest in teaching/mentoring future generations and have been taking action since my undergrad. For example, I (1) have participated in teaching children from economically-disadvantaged and under-educated families, and adolescents with mental disabilities as social works during my undergraduate study; (2) have been officially working through my family business to improve education efficiency for 1k+ primary schools in different cities for years (10+ hours per week); (3) have mentored more than 10 students from different backgrounds (PhD/MS/Undergrad, local/remote/international) on their research projects; and (4) have helped facilitate a regular undergraduate class as a teaching assistant. All these experiences, together with the influence of my parents, bring me a profound understanding of the importance, challenges, and rewards of teaching/mentoring. In the next several paragraphs, I will introduce my thoughts on education's goals, standpoints, mentality, and methodology. I will start each section with my general idea, followed by my specific experience and how I plan to behave as an assistant professor.

1 Goal

Mentoring/teaching is all about long-term impact. Mentoring/teaching is not just about how much progress students/advisees can make when I am with them, but also how the thoughts that I encourage grow after they depart and move on. Of course, it would be great if students could quickly grasp all the answers in class, and all advisees could smoothly complete the individual research tasks and achieve milestones such as publications, but it would be better to help students pick up reasoning skills and self-learning abilities, as well as support advisees in building their systems of research approaches and philosophies so they can become truly independent and further spread their impact.

With that in mind, when mentoring research, I always thoroughly introduce the background and high-level motivation so advisees can have an opportunity to construct their reasoning, express concerns, propose plans, and get feedback to accelerate their self-evolvement before drilling into concrete steps and methodologies. While teaching, instead of providing shortcuts to the answers, I prefer to provide more clues and encourage students to link them into the solutions. I also tend to introduce self-learning resources such as online forums, knowledge bases, and books, so interested students can continue their education further after they finish the class. My focus in the long-term is also highly appreciated as “working with Mingzhe is more than learning about and solving technical challenges. He also brings insights on future plans and visions, which I really enjoy.”

2 Standpoint

Mentoring/teaching is a process of mutual direction, regardless of the role of advisors/advisees or instructors/students. The essence of education is respecting, comprehending, and exchanging unique understandings on various topics with different backgrounds. Even if I may be more experienced, that does not mean I should patronize the students/mentees. I should also revise my knowledge wall with the bricks they have given to me. I find it astonishing how much I have learned from my juniors. For example, when I helped collect and analyze feedback from primary school students about their supplementary Chinese textbook (the schools are in China), there was one sentence, “The landscape is resplendent with variegated coloration” (translated from Chinese), that spurred surprisingly intensive comments from the children. It turned out that this short depiction of scenery, which is straightforward for book editors and me to grasp, caused massive trouble for the kids as they were not able to match it to a detailed view based on their prior experience. Though the solution was as simple as adding a picture next to the text to help readers get a specific sense, these kids remind me to put myself into other people’s shoes.

Having gone through multiple experiences like this, I treat students/advisees as collaborators of equality. I help them thoroughly illustrate their opinions and discover the highlights and potential drawbacks by asking clarifying questions, then initiate discussions with my own “sauce” gradually added, and eventually conclude with the joint advantages of both sides. I plan to stick with this approach during my academic career as I am glad to learn from and proceed with the students, and I am proud to hear that “with his style of communication, I never need to worry about being neglected, and I am always inspired by how he further stretches my ideas.”
3 Mentality

Mentoring/teaching is a gradual, slow, and steady process, which requires patience, calm planning, and execution. Even though being cool-headed might sound like a cliche, it might be surprisingly common for junior professors to leave this behind, as they are usually ambitious and have specific plans they want to carry out as quickly as possible. With the pressure from other work such as securing funding and achieving milestones in order to obtain tenure, young faculty may hastily leave the students in classes with an unorganized pile of raw knowledge to digest by themselves, and the advisees may get blindly pressured to complete concrete tasks without substantial briefing or discussions. Behaviors like these might bring more tangible progress in the beginning while hurting the longer view and greater good. I experienced this when I taught adolescents with mental disabilities. At that time, though with good intentions, my haste caused me to conduct over-assertive micro-managements before trying to figure out the characteristics and needs of this unique group, resulting in resistance and little progress. Realizing my reckless behavior, I took a step back to the original setting: I discussed the class settings and key points with senior colleagues, and eventually tried applying further enhancements such as teaching the smarter ones first and letting them spread their knowledge to others (as they have a different way of communication between people with similar symptoms, which is more efficient).

Since then, I have stopped acting based on my initiative during the teaching/mentoring process. Before nailing down any decision, I always try to think twice about it from the students’ perspectives to mitigate potential defects, such as unclarified confusion and irrational pace/density. The paper cranes I received from these unusual students, which cost them extra effort, still remind me to stay calm, stable, and steady when teaching/mentoring.

4 Methodology

Excellent mentoring/teaching is not just about passion and commitment. It also requires scientific thoughts for maximal efficiency. A dedicated TA can spend 25 hours each week answering individual questions from students. While the TA can do the job well, there is a more efficient way: the TA can have a 45-min chat (or lunch) with the previous TA, figure out a FAQ list, invest one hour in making the FAQ in readable formats like documents or videos, and then publish it to the students. My current personal experience with videoing FAQ for CS154 (“Introduction to Computer Systems”, a class with 80 students) is getting great feedback from the students (“The videos are great!” , “The videos are so helpful and clearly explained!”) and dramatically reduces the duration of TA sessions to five hours per week, as the FAQ video can handle most of the questions. With that, I can put the rest of my time into helping individual students and improving the class materials, such as clarifying mismatches between the textbook and lecture slides. All of this gives me a 9.8/10 evaluation on my TA performance, and tons of compliments from students (“responsive to any kind of communication”, “straightforward in explaining topics and so patient with students”, “very approachable and sympathetic towards students”, “One of the best TAs I have had in CS”, “This class is so hard, and you make it so much easier for us”).

Regarding mentoring, when I collaborate with different students of various backgrounds, I try to start (note: not necessarily end) with the ways they excel. For example, some students prefer to have tangible progress to get motivated first before viewing the project from a global perspective, which is fine in the beginning. Some students need a relatively comprehensive roadmap to locate their positions before taking technical actions. My adaptive way of working with them gets me feedback like “the best mentor so far.”

In the future, I plan to continue my effort to improve the efficiency of my mentoring/teaching. For mentoring, I will keep the regular communications compatible with the student working styles while appropriately rendering my impact. For teaching, I will first focus on optimizing the heavyweight parts, then use the surplus to enhance the regular ones.

5 Future Courses

With my previous teaching experience and my knowledge in the system and machine learning field, I am glad to teach related classes at both undergraduate and graduate levels, including but not limited to:

- **Undergraduate-level**: Introduction to Computer Science/Systems, Computer Architecture, Operating Systems, Networks, and Distributed Systems
- **Graduate-level**: Machine Learning for Systems, Topics in Systems/Distributed Systems/Operating Systems