



As Alexandre Grothendieck (late top French mathematician) used to say, it is the ability of listening to the voices of the subjects that attributes to the creativity and imagination of a researcher. As to teaching however, I shall paraphrase his words—it is one’s attention to students’ hearts that leads his teaching to efficacy. I have been exclusively teaching ECE486 Lab for nine consecutive semesters as a Graduate Teaching Assistant in Department of Electrical and Computer Engineering. ECE486 Lab is an elective senior’s laboratory for controls flavor of electrical engineering. It features heavy linear algebra and complex variables of mathematics although the course adverts state its prerequisite is merely “a solid knowledge of calculus and being cognizant of analog circuits (ECE210)”. This class is also believed to be the only one of its kind available at undergraduate level, which makes its unique reputation for attracting attending students from a wide range of backgrounds, sometimes sophomores paired with first year graduate students. Therefore the onus is on me to ensure that a minimal intersection of all common knowledge is adopted at the start and everybody emerges from this class as a technically proficient control engineer in the end.

A salient fact goes about discrepancy between obsession with grades and mastery

“Ce qui fait la qualité de l’inventivité et de l’imagination du chercheur, c’est la qualité de son attention, à l’écoute de la voix des choses.”

ALEXANDRÉ GROTHENDIECK, *Recoltes et Semailles*, p. 27

of the nature, i.e., “the objective of learning is not to obtain the highest ranking, the highest score, or the highest number of prizes and awards; instead, it is to increase understanding [of mathematics]” (Terence Tao, top Australian mathematician), both for the students and for myself, and to contribute to its development and applications. Indeed the lab manual presents bare bones of teaching, I nonetheless at the beginning of each lab include a 20-minute mini lecture filled with comments on prelab and previous labs before I segue into briefing the students on the new lab. For example, there is a data processing technique called “linear fitting” in determining the time constant τ of a DC motor, which says “take response voltage V_o and define $LHS \triangleq \ln(V_{ss} - V_o)$, then LHS is a linear function of time t ”. One very cynical answer to the cynic would simply be that one of the most practical reasons for knowing how to compute time constant τ is that, it is a problem somewhere on the prelab at a point! I would rather reveal the intuition behind the name “linear fitting” in the mini-lecture like this: for any exponential function of t in a general form $y(t) = C_2 e^{C_1 t}$, we can rewrite it as $\ln\{y(t)\} = C_1 t + \text{Constant}$. This revelation quickly bridges the gap between the mathematical fact and technique itself. Mathematical equations are often derided by students as being too *abstract*. So I recommend reading equations in natural languages in lieu of mathematical symbols. The phenomena exist and symbols are employed as shorthand to describe what we “see”, not vice versa.

“... Whenever a student gets stuck he [Yün] doesn’t just give out the answer, he guides you through it and makes sure you understand what you are doing. I also found it very helpful when he wrote down comments in matlab while explaining so you don’t forget it later. I was scared at the beginning of the year because I felt behind but the lab really helped to catch me up ... Yün does an excellent job explaining the material in a clear and concise manner. He showed confidence and a positive attitude in his interactions with students. I can’t think of anything to improve upon except [Yün] to keep being **positive** and **patient**.”

As teaching evolves, it is nigh on an instinct of me to spot who is lagging behind after a few exchanges during Q&A thus *support* for them is needed. I concede no matter how well I am prepared for the class, for some students outside the department, there is still a tough get-started awaiting. A steep learning curve in front, either insidious effects of thinking of the class as a formidable task go on without curb and with vicious circle ensued, or it is only a blip after which I invite them to have a discussion of their concerns in the office hour. They are all tendered an offer from me that I can work with them anytime during the week and I am committed to being the last one who leaves each lab session as long as the student prioritizes learning on their side, since there is one thing that has *no parallel* at all—the moment when frustration disappears and joy re-emerges on the student’s face.

“ The instructor [Yün] was not only extremely capable of teaching, explaining difficult material and helping students, but he was also very patient and approachable. He gave students the individual attention that was needed for the course ... Yün was the best TA I ever had. If other TAs care a fifth of how much Yün cares UIUC would be a much better place ... Yün has by far been the best TA I have ever worked with. He truly cares about his students and is always there to answer questions. The speed at which he returns our prelabs and the notes on the prelabs are unbelievable. I honestly think that all TAs should model themselves after Yün ... ”

More one-on-one interactions with students feature in a lab class than lecturing, whilst a lab also creates a classroom climate for everybody, including myself, to learn from others. I encourage students to peer tutor anyone in need of help. Not only in this way does one student catch up with another, but the student tutor can in tandem cement knowledge in their own mind; otherwise they would regret opportunities slipping through their fingers had they missed out on demonstrating the capability of successful delivery of understanding of the material to fellow students. Students inspire immediate improvements in teaching too. During Fall 2014, I came up with a \LaTeX version of all lab reports in the hope that the students would not concern about their documents’ print quality, instead they spend more time on keeping their thoughts complete and fluid on mathematics. Students welcome the move, echoing to write in \TeX is a better way to smooth the process from scratch work to high quality reports.

As for a control engineer, it is crystal clear that *feedback* cannot be overemphasized. When students raised questions about outdated lab manual, I revised the lab book on the fly; when students’ collaboration went sour, I took tenacious bids to quench the arguments in the first place; when an attention seeking kid was trolling in the class, I reasserted my firm stance that even smart pupils need discipline to equate themselves to high achievers; when I was awarded Olesen Teaching Excellence, I donated the accompanying stipend to Control Systems Lab because I am a stalwart advocate of public education. I believe any teaching recognition belongs to this lab—without my students, who I am today would be very different.

Therefore I am very proud that I have managed a good relationship with my students over the years. Dubbed inexperienced, nervous, feckless at a rocky start but now urbane, dynamic and doughty to shelter my students anytime, I am honored and extremely grateful to my students for their unlimited tolerance and unselfish support. It is them who always encourage me to be better than ever. I will always be a student being able to listen to, and a teacher helping others find confidence in themselves rather than in myself.