Teaching Portfolios

In teaching, we do not impose our wills on the students, but introduce them to the many mansions of the heritage in which we ourselves strive to live, and to the improvement of which we are ourselves dedicated.

Israel Scheffler, World-renowned Philosopher of Education

A. Goals

Teaching is far more than just transmitting information. I believe that teaching is mainly about motivating and evoking a desire in students to learn and to do their best, so that the students will develop their own **career-long habits of self-motivated learning**. In this sense, I am inclined to put more emphasis on the **learning process** than information transmission and more on **critical thinking** than rote memorizing. This is especially true in teaching postgraduate students, who should have acquired a certain level of proficiency in subject matter. In addition, I believe teaching should not solely focus on developing students' intellectual capabilities. Through learning, students should also develop a strong sense of **self-efficacy, conviction and placidity** on which they become leaders in this rapidly changing society. I am guided by the following principles:

To Motivate Students to Learn

As a student, I can recall that the courses from which I learned and retained my understanding were those courses taught by professors who were motivated and interested in the course themselves. Their **passion and enthusiasm** was infectious and made me want to learn. I seek to present to my students the same attitude of eager, interested engagement with the course material.

To Develop a Good Relation with Students

Teaching is a collaborative activity, and much more than simply delivering information to students. The relationship between teacher and student, as I have come to realize, is by no means hierarchical, and might best be conceptualized as **dialogic**. As a teacher, I encourage students to think of themselves as members of a learning community, not simply empty vessels to be filled with information. Teachers should learn from the students just as much as students are expected to learn from teachers.

To Challenge Students

To learn, one needs to sense that the material being taught is interesting and challenging; to gauge one's learning, one needs to overcome challenges. These challenges exist on many scales: a pause in a lecture after a well-placed question to allow students to think; a comment at the end of a problem concerning similar problems that students might pursue further; challenge questions on assignments and in tutorials. And, most of all, there is the challenge to students to **master a subject area**.

B. Responsibility

1. Lecturing

In the last three years I have taught the following courses:

Scientific Instrumentation II
(Higher Diploma in Applied Physics, 50 students)

Scientific Instrumentation III
(Higher Diploma in Applied Physics, 50 students)

Advanced Instrumentation Laboratory
(Higher Diploma in Applied Physics, 50 students)

Science and Technology of Thin Films
(Master of Science, 20 students)

In order to ensure effective teaching, the following techniques have been used:

i) Interesting new laboratory experiments developed

New experiments, for example, *computer-based experiments* for *Advanced Instrumentation Laboratory*, *music box and traffic light experiments* for *Scientific Instrumentation II*, and *films processing and characterization experiments* for *Science and Technology of Thin Films* have been developed to aid students in visualization and to help them to relate their knowledge with daily life/practice. Judging from feedbacks from students, these experiments are well planned and allow them to apply the knowledge gained from the lecture. Students can develop a deeper understanding of how to relate the subject with daily life through these experiments.

ii) Student-centered Tutorials

In my tutorials I have students work on a set of problems. Over the course of an hour, they work in *self-selected groups of 2-3 students* and work over the problems. They are free to request my help as I move amongst the groups and offer suggestions and feedback. Students who arrive at solutions write these on the board, and if questions arise or errors are made I take these up at the end of the tutorial. Over all, students are encouraged to try to solve problems before seeking my assistance and to use their own knowledge to verify their solutions. These tutorials **encourage the students to learn** and provide them with a **valuable learning experience**.

iii) Discussion with students

This includes both **individual** and **group consultations** which foster an open culture in teaching and a caring environment for students. Through discussion, I can ensure that the syllabus is up-to-date and consistent with student needs. In addition, a **fair student assessment procedure** is developed through discussion.

2. Supervising postgraduate students

Supervising 3 MPhil Students in 2003/2004.

i) Miss Chan Ka Yi, *Optical Properties of Sol-gel Derived Strontium Barium Niobate Thin Films*.

ii) Mr. Yuk Tsun Yu, *Structural, Dielectric and Pyroelectric Properties of Compositionally Graded (Sr,Ba)Nb_2O_6.*

iii) Mr. Wong Wing Fai, *Development and Applications of Long Afterglow Luminescent Materials*.

Successfully supervised 5 MPhil students:

i) Mr. Luk Chiu Hung (1997), *Characterization of Ferroelectric Strontium Barium Niobate Films Fabricated by Sol-Gel Method*.
(**4** journal papers and **2** conference paper published).

ii) Miss Ho Man Tak (1999), *Optical Properties of Sol-Gel Derived $Sr_xBa_{1-x}Nb_2O_6$(SBN) for Optoelectronic Application*.
(**2** journal papers and **2** conference papers published).

iii) Mr. Lai Brian (2000), *Fabrication and Characterization of Sol-Gel Derived $(K_xNa_{1-x})_{0.4}(Sr_{0.6}Ba_{0.4})_{0.8}Nb_2O_6$ (KNSBN)*.
(**3** journal papers and **2** conference papers published).

iv) Mr. Yeung Kai Ming (2002), *Fabrication and Characterization of Insulating-film/Phosphor-film/Insulation-film Heterostructures*.
(**3** journal papers and **2** conference papers published).

v) Mr. Tsang Wah Sze (2003), *Spectroellipsometric Study of Lead Magnesium Niobate-Lead Titanate (PMN-PT) Thin Films*.
(**5** journal papers published).

C. Evaluations & Results

The average **SFQ score** (Grand mean of items on Overall View) for the past three years is **3.9**. This is about the **75th Percentile score** of the FAST cumulative average.

Those students who have done graduate work under my supervision have done very well indeed. They have published more than **3 papers per student** under my supervision, and several of them are working for their PhD degrees. Besides, one of my MPhil student, Mr. Tsang Wah Sze, got **2nd prize in the 7th Challenge Cup** (National Competition, China) in 2001.