

# The magic ingredient in a teacher

THESE has been recently a spate of articles giving critical observations on teaching profession ending with the article "Teachers to be taught?" by a former Judge of the Supreme Court (*The Hindu*, July 30, 1998). How can any one but not note agitations such as the recent three-week strike by college teachers or the boycott by IIT professors of the prestigious JEE valuation some years ago to get redress for their grievances?

As I reflect on my experience as a professor, what stands out for me personally is not what I or my colleagues regard as my successes or failures but the gratitude I feel for the unparalleled privilege of participating in one of the most exhilarating activities or occupations of mankind.

This essay is a personal commentary, elucidating by examples the essential role of a good teacher. Teaching is intimately connected with the complementary cognitive process of learning, which adds its component to the magic ingredient. They are indeed dual phenomena.

Cognitive mechanisms in educational psychology have been explained quantitatively in terms of the analogy of a heat engine. The heat engine's efficiency can be improved by increasing the temperature at the input end or by decreasing the temperature at the output end of the Carnot cycle, which is the fundamental Second Law of Thermodynamics. Similarly, for a given quantity of teaching, a greater density of information can be packed by either increasing the quantity of the information or reducing the quantity of information lost — that is, the loss of information to the less important facts.

The first is easy, as it can be achieved by pruning the subject matter to ensure maximum information-content. It is the second which is elusive, as here the brain operates a selection mechanism, rejecting to register the facts which are not of significance to the theme. There are

pedagogical and psychological approaches to improve student learning, to which a teacher has to pay attention continuously.

Most students cheerfully squander months of their time, but when they come to college, they consider attending lectures as oppressive. It is a common sight to find absenteeism from college classes on the increase. On students' part, they deplore the emotional contact that the lecturer fails to establish, by dictating or copying on the board his lecture notes.

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read one's notes is like inviting a friend for a walk and asking him not to mind if you go alongside him in your car," admonishes William Bragg, a reputed lecturer and Nobel Laureate.

To stimulate the young audience, a teacher must possess zest and further display in what he teaches. It is equally his responsibility to help students to discover for themselves this enthusiasm. In doing so, he necessarily has to rely on his expertise, but he is not a retailer of facts and figures. Had this been so, a modest library is far superior to a teacher as a purveyor of information.

A teacher can hardly inspire unless he shares the enthusiasm with his students for his subject. For this reason, everyone who embarks on a teaching career should reflect about the history of his own education. He needs to ask himself some basic questions such as: Has he ever found

joy in the subject he now takes up for teaching? In what way did he discover this joy, when the roles were interchanged? The answers may tell a lot about how a teacher can make an indelible mark in the classroom. So this is a practical formula: "How we learn comes out transparently in what manner we can teach."

Take, for example, the impact on Harold Black that a single lecture delivered by the celebrated electrical engineer Charles Steinmetz. Black recalls with fervour his attending this lecture on March 16, 1923:

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"It was an inspiring lecture. I no longer remember the subject, but I do remember the clarity and logic of his presentation. I was so impressed by how Steinmetz got down to the fundamentals that when I returned home, I restated my own problem". This led him to the invention of the feedback principle, a landmark in the history of engineering; this is no ordinary achievement, as it revolutionised the art of communication and control. But for this invention, long-distance communication networks would not exist.

We have very little information on Plato as a teacher, as his famous student Aristotle left no autobiography. But in the writings that have survived, Aristotle did speak of his friendship for his old teacher, even though he disagreed with certain of his teachings. The word friendship connotes special significance in an era of con-

frontation and conceding students' demands in academic management. We cite a recent example from modern era. It appears the Governing Body of the Normal School, England, inadvertently added to its teaching staff the eminent biologist T. H. Huxley (1825-1895) who studied and taught science for its own sake, with no utilitarian ambition. H. G. Wells spent his first year as Huxley's pupil and he was jubilant about what he gained: "The year I spent in Huxley's class was the most educational year of my life." Still, Wells was not a serious student of science.

Such equally valid divergence is easily possible in a multi-dimensional profession such as teaching, where a stereo-typed standard, by which competence can be gauged, does not exist.

Enthusiasm must be continually renewed: if teachers were merely to be concerned with information, the process would grow dead. Hence productive scholarship to nurture enthusiasm is demanded from the teacher, but this term is too often narrowly construed. It is just easy to equate it with another activity of higher dimension, namely research. The teacher is compelled to embark on the pursuit of research.

The word STUDY may be very near to the activity expected: it can mean any kind of reflection on the topic that a teacher is going to teach. This definitely helps him to generate enthusiasm in the class. The research tradition has had some beneficial effects, but the effects on teaching have not all been that good. It, by no means, engenders enthusiasm for teaching.

So the goal of teaching should be to communicate learning experience, too. Unsolved problems should be introduced at appropriate stage, as often as solved problems. The example of Robert Millikan reinforces the point.

When Robert Millikan (1868-1953) started his career in the University of Chicago, Amer-

ican Physics was in its infancy. The most effective way of learning physics, according to him is by problem-solving and not merely by the passive method of lecturing. He wrote in 1906 'First Course in Physics' based on his educational philosophy. It sold steadily through the years.

Because of his outstanding achievements as a teacher, Millikan was promoted (1907) to the rank of professor. Eager to launch his career in research, he decided (1908) to shelve the writing of textbooks. He was awarded the Nobel Prize for Physics (1923).

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In 1921 he joined the California Institute of Technology as director of research, attracted and inspired a band of talented students. Under his guidance, Cal Tech grew from obscurity to a position of pre-eminence.

With a quantitative expansion in student enrolment, a steep decline in teaching has set in. One of the terms of accountability in the Rastogi Committee report (1997) is the students' assessment of teachers. If the students can be entrusted with evaluating teachers' work in terms of dedication, content of the lectures and the capacity to communicate, what is the function that the heads of the institutions are expected to contribute to the improvement of teaching in colleges? A lecture is a blunt educational instrument. But Fr. Lawrence Sundaram, (who

taught me English in St. Joseph's, Tiruchi) who passed away a month ago, showed how it can be used to electrify the classroom. Here is a stirring narration:

"Fr. Murphy (himself a renowned English Professor) announced to me one day that he would be dropping into one of my classes, a class of nearly two hundred of the old Intermediate course. He sat through my explanation of an English Prose text and about five minutes before the end, got up, asked me to leave and then spoke to the students.

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I don't know what he told them: but I know how it improved my relations since I had been having a difficult time managing them as a new young lecturer. Fr. Murphy gave me in private an assessment of my lecture, congratulated me, noted a point or two of pronunciation to be rectified, comments which I always treasured with gratitude. He gave me such encouragement that ever afterwards I could feel a couple of inches taller when I went into a lecture room." (Reminiscences about Rev. Fr. L. D. Murphy, Loyola College Magazine, 1980)

This is responsible teacher assessment that will contribute in respect of accountability, to improve the standard of teaching.

R. Parthasarathy