

Mathematicians' Responsibility for Mathematics Education

— The Role of Lighthouse in the Dark —

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Without exaggeration, most departments of mathematics of Japanese Universities now care serious disrelish for mathematical thinking among young students.

A short but intensive hearing of students in mathematical departments of several universities proved that they have their firm conviction on their way to learn mathematics: Learning of mathematics is nothing but learning by heart how to “solve” problems and how to “prove” theorems in contrast with their poor confidence in mathematics they learned in their university. Young students are diligent enough to learn mathematics by heart without any understanding of the mathematical theories underlying back in their background. Almost all of them agreed that they were taught to study mathematics in that style in high school days.

In Japan as in other countries, the standard style to teach mathematics up to secondary level is quite naturally to instruct basic techniques of calculation in the elementary level and to give wider chances to experience how to apply the basic techniques to apparently difficult problems.

In a sense, mathematics education has been carried out with a large emphasis on the problem solving especially in Japan.

But problem solvings are not the goal of teaching mathematics, just the good style to inspire students' taste for mathematical thinking. But ironically, all “efforts” in high schools to give students the chances to learn the variety of mathematical problems are now to result in the firm belief among youth that learning mathematics is never more related to theoretical thinking than memorizing the correspondence of natural numbers with the historic events.

The deep discrepancy of the views over learning mathematics between students and professors is not easy to overcome. The real cause which has brought the discrepancy to so serious extent is not at all easy even to identify. Multi-sided collaborative study to solve these difficult problems with prudent intelligence not bringing easy and quick conclusion is really needed.

However it is clear with few exception that young high school students cannot have their happy encounters with mathematics without good mathematics high school teachers who love mathematics and who show students various interesting aspects of mathematics through “usual” class of “ordinary” mathematics with their confidence in understanding of basic modern mathematics.

Therefore we can have a hope that an innovative change to education system can be brought by mathematical department without appealing to political powers and without praying for big social changes, if we are more successful in bringing more and more graduates with mathematical confidence as well as mathematical competency. Ideas more in detail will be discussed.