



OPINION

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Mathematics - Its place in the real world

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Many people, especially academics, like to ask the following questions:

- (i) Can you bring your research work down from the shelf and into the shop?
- (ii) Can you convert your research work into money?

In particular, these kinds of questions are aimed at mathematicians. They are even asked the question:

- (iii) Can Thailand afford not to bother doing research in Mathematics?

We, as mathematicians, know very well that Mathematics results serve successfully as tools for various areas of application, both low-level and high-level. We also know that it is not easy to answer questions (i) and (ii) in just a few sentences, unlike in some other scientific disciplines. Here I hope to provide a brief answer which may help funding agencies such as The Thailand Research Fund (TRF), the Commission on Higher Education (CHE), and the National Research Council of Thailand (NRCT) to understand the nature of our work better.

For this purpose, I divide research in Mathematics into two main categories:

- (I) Mathematics research
- (II) Mathematical research

Mathematicians in (I) provide us with new concepts and theories for the development of Mathematics itself. These concepts and theories can sometimes be very deep which makes it difficult for others to see where they came from and how they can be applied to real world problems. Often, only

a relatively few people are able to fully appreciate the true beauty of a theory and the time and ingenuity that has gone into developing it.

In contrast, mathematicians in (II) mostly develop their theories for their own practical use in areas such as mathematical physics,

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mathematical economics, and mathematical engineering, to name just three. However, it should not be forgotten that the knowledge and techniques from (I) are the essential precursor for (II), similar to a pattern for teaching children to walk.

Both kinds of research, (I) and (II), contribute to Mathematics. In addition, there is all the research that is being carried out by non-mathematicians that nevertheless involves the use of Mathematics for their own purposes. Mathematics invariably plays an important role in most branches of science, technology and engineering without being given the credit it deserves, simply because the focus of attention is on the development of the final product. Because this final product, whatever it may be, then becomes

“useful” in the real world, it helps these disciplines to answer questions (i) and (ii) at the start of this article. Sadly, the essential role played by Mathematics in helping to achieve this final outcome is, at best, undervalued and, at worst, overlooked completely.

It is therefore my OPINION that funding agencies such as TRF, CHE and NRCT should consider providing more grants for research in (I) and (II) in recognition of the fact that Mathematics exists in the real world too, albeit less conspicuously. It just requires those who make the decisions to see the wider picture and to appreciate the vital role that Mathematics plays in a country’s research and development program. Only then will Mathematics start to attract the level of research funding that its importance deserves.