Fiscal 2008 Highlight 1

The fun of learning about mathematics education around the world using scientific calculators

Casio provides support to enable educators to use its scientific calculators more effectively in schools around the world. Here, Casio's goal is to improve the mathematics skills of students, and to provide opportunities for them to discover the joy of asking "Why?"

In 1985, Casio launched the world's first calculator with a graph drawing function. In 2004, the company developed the "natural mathematics display" that can show mathematical expressions such as fractions and the square root symbol as they would appear in a textbook, and it has further extended this ease of use since then.

Scientific calculators that encourage asking questions and discovery

Casio led the world in commercializing the scientific graphing calculator, and it is now making dramatic inroads in schools overseas, in Australia, Singapore, North America, Germany and other countries.

Tomoaki Satoh, who was involved in this initiative as a leader in the development of scientific calculators, explains the background. "In other countries, the conditions are different in each region. There are teachers who actively introduce new teaching methods, and some schools allow calculators to be taken into classrooms and exams."

"Mathematics follows a story of identifying a problem, and then finding the right way of thinking to solve it. Casio's scientific calculators are developed for use in line with this story. I think that there's quite a big overlap here with education policies that emphasize the thought processes of 'discovery,' which help students find the 'why' of things. Teachers can use the scientific calculator to save themselves the trouble of drawing graphs on a blackboard, and devote the lesson time instead to thinking about the real meaning of the graphs." (Satoh)

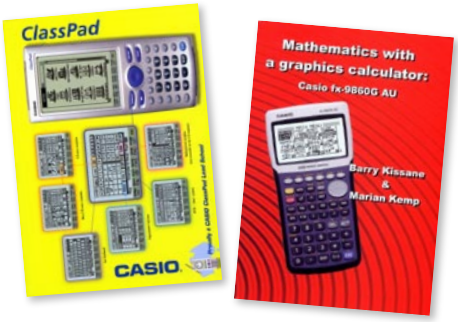
Getting feedback for product development from the classroom

The Teacher Network for communication between teachers, and Casio WEW (Worldwide Education Website) established by Casio in 1998 as a support site, represent a worldwide stage for support in the classroom using scientific calculators.

The Teacher Network was set up by teachers who agree on the validity of using scientific calculators in venues for learning. Its purpose is for mathematics teachers everywhere to share best practices and know-how with their colleagues in other regions.

"Participating teachers collaborate with us in holding workshops to expand the user base, by giving lectures and so on to other teachers on how to use scientific calculators and their use in the classroom." (Satoh)

Casio WEW is a support site with product information, video clips explaining how to use scientific



Educational texts for use with scientific calculators

Tomoaki Satoh
Consumer Unit, Product Development Headquarters

Works to popularize Casio's scientific calculators and provide support to educators. Based on opinions gathered from users, takes part in product development to make functions easier to use.

calculators, and a download service for data for use in the classroom, as well as a corner for questions. Since it went online, more than 15,000 mathematics educators from around the world have been using the site.

"At Casio, we listen to the opinions emerging from all those teachers through a range of communication channels, and these are reflected in our product development. For example, there are many classrooms overseas that use only natural light and so are sometimes under-lit. Since teachers expressed the wish to protect their students' eyes, we launched a scientific calculator for educational use with a backlight function. Real needs in the classroom also led to a function for linking changes in formulae and diagrams, a function developed for displaying the screens of pupils' scientific calculators using a projector, and other developments." (Satoh)

Facilitating communication among local teachers

Since many of our initiatives are supported by the voluntary participation of teachers, Casio carries out these activities in a flexible manner, with content that matches the circumstances of the country. In Singapore, which is known as a mathematically advanced country, teachers at all levels of primary and secondary education communicate very thoroughly, and they are now actively promoting workshops to prepare for lifting of the ban on standard scientific calculators in the Primary School Leaving Examination scheduled for 2009. In the United States, a much larger country, we are promoting a training system that uses the Internet. And in Germany where the states have their own curricula, mathematical associations and fairs are held in each state, so Casio provides meticulous support for each region.

"The method of representing the answer is different in each country, and functions that are well received on a global level are described as difficult to use in certain countries. In that case, we develop a new product for those countries, or give advice about how to use the function. From a personal point of view, it's a real pleasure to get to know the customs and thinking of different countries through mathematics." (Satoh)

Recently the level of mathematical skill has been falling in Japan, and concern has been voiced about a retreat from science, but as Satoh points out, "There's growing momentum for placing emphasis on the problem-solving process and making use of technology." For example, at the Tokyo Gakugei University International Secondary School, teaching staff prepared textbooks for first year junior high school students that use scientific graphing calculators in many curriculum units. Casio's fx-9860G calculator was used for this project. In addition, in regular academic high schools and technical high schools across the nation, scientific calculators are increasingly being used in lessons.

Casio supports public experiment classes using its scientific graphing calculators at the national research conference of the Japan Society of Mathematical Education, as well as other initiatives to reinforce its education support activities in Japan.

"I hear all sorts of unexpected opinions from around the world, so this work has its difficult as well as its enjoyable aspects. I hope that the next generation can also take pleasure in mathematics. That's why I want to keep on providing support for raising the level of education around the world." (Satoh)

A range of scientific calculators for different applications

Global Teachers Meeting, Tokyo, 2007