



**CASIO**

EDU-Port Japan Supported Project

# **Inquiry-Based Mathematics Education Project in Egypt**

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CASIO COMPUTER CO., LTD.

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## 1. Introduction

(1) Global usage of scientific calculators

(2) Effects of using scientific calculators

(3) Teaching materials to support the use of scientific calculators

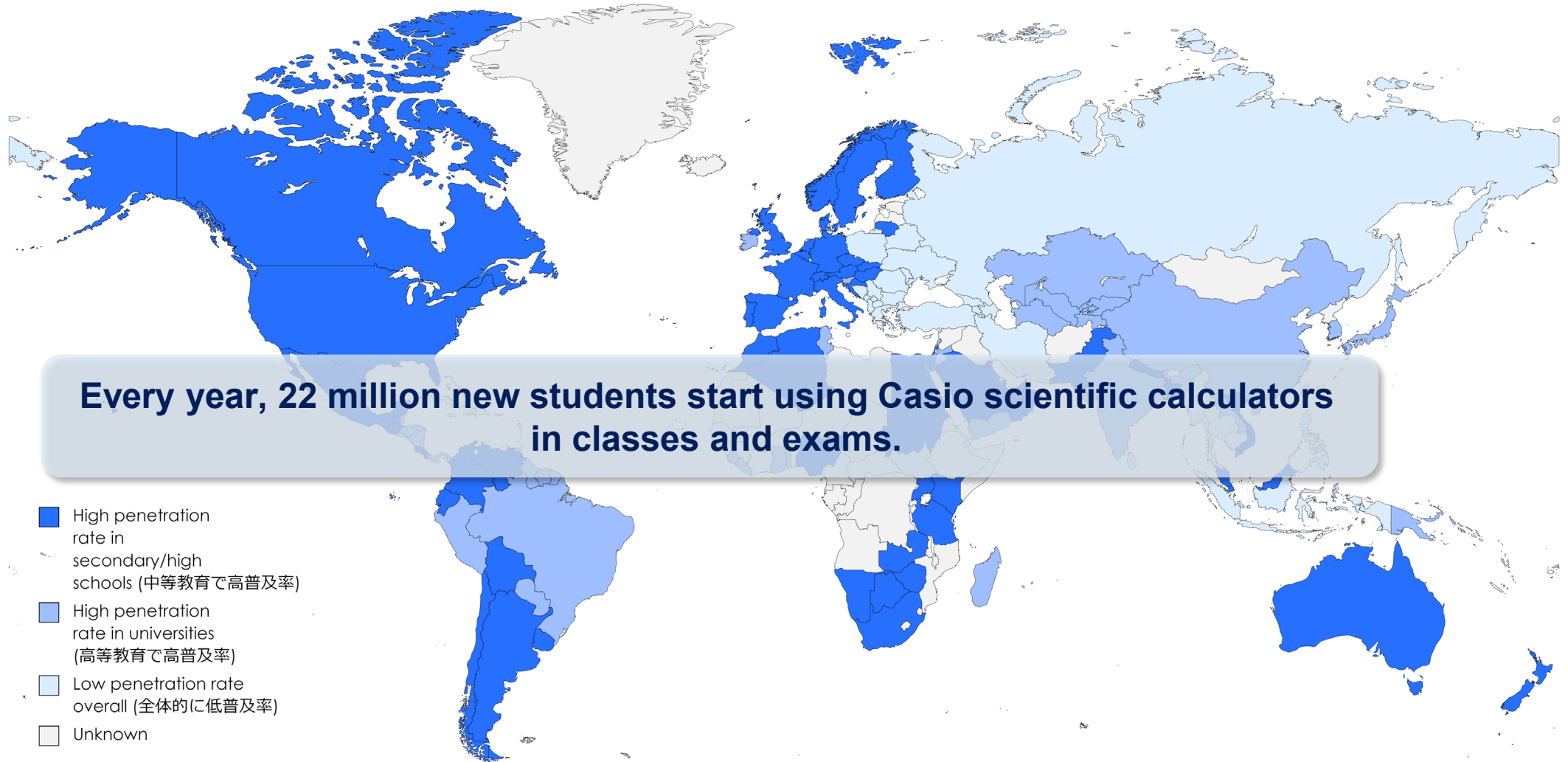
## 2. Progress in EDU-Port Project

(1) Overview of EDU-Port Japan Supported Project

(2) History of partnership with MoETE and EDU-Port Japan Supported Project

(3) Training at private schools and workshops at the Department of Mathematics,  
Faculty of Education, Ain Shams University

# 1-(1) Global Usage of Scientific Calculators



## 1-(2) Effects of Using Scientific Calculators

- Using a scientific calculator enables **fast and accurate calculations**, allowing students to **focus on the thinking process**.
- Can enhance high-order thinking skills and interest in mathematics
- Use of scientific calculators broadens the scope of what students can learn.

Time allocation for learning mathematics



Learning without a scientific calculator



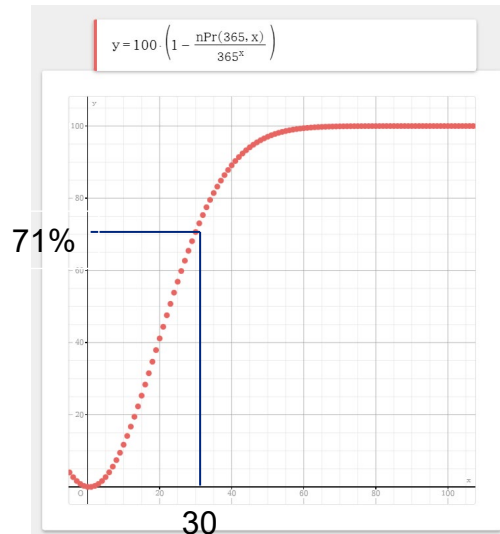
Learning with a scientific calculator

■ Calculation process ■ Thinking Process

e.g.) What is the probability that two out of 30 people have the same birthday?

$$100 \left( 1 - \frac{365P30}{365^{30}} \right)$$
$$70.63162427$$

$\cong 71\%$

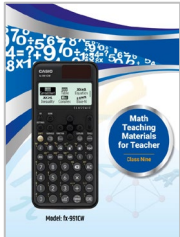


**This approach aligns with Egypt's new curriculum, which emphasizes competency-based education focused on fostering abilities such as critical thinking skills and a proactive attitude toward learning.**

# 1-(3) Teaching Materials to Support the Use of Scientific Calculators

## Teaching materials to encourage the effective use of scientific calculators in the classroom Inquiry-based and real-life problems were incorporated to promote active learning

Egypt



### Teaching materials for each country

- Developed to **align with the curriculum** of each country (Egypt, Bangladesh)
- A guide to using scientific calculators effectively in **active classes by incorporating real-life problems**



### Teacher training for classroom practice

- Purpose and method of using a scientific calculator
- Inquiry-based lessons and how to encourage students to think**
- Follow-up by monitoring classroom practice



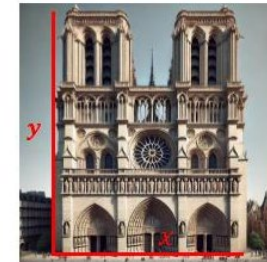
Example of teaching materials: Mathematics problems in real life  
Using a scientific calculator allows for fast and accurate calculations, making it easier to handle real-world numbers that are difficult to compute by hand.

1

The ratio expressed by the following values is called the golden ratio.

$$1 : \frac{1+\sqrt{5}}{2} \quad (\text{※ } \frac{1+\sqrt{5}}{2} \text{ is called the golden number.})$$

The golden ratio has been considered a beautiful ratio and is often used in historical buildings and art.  
Answer the following questions (1) to (3) regarding the golden ratio.



$$x:y \approx 1 : \frac{1+\sqrt{5}}{2}$$

(1) Answer  $\frac{1+\sqrt{5}}{2}$  to the nearest decimal. (Round your answer to the fifth decimal place.)

$$\frac{1+\sqrt{5}}{2} \approx 1.61803$$

[Calculate]. a1+s5R2B nR|



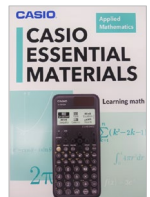
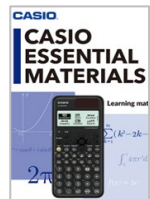
Operation and screen examples of scientific calculators

### Teaching guides and worksheets to make regular classes more efficient

- How to incorporate scientific calculators into **regular math** classes and provide long-term implementation support
- Comprehensively covering key units** involving calculations for middle and high schools
- Relevant sections can be selected for global use

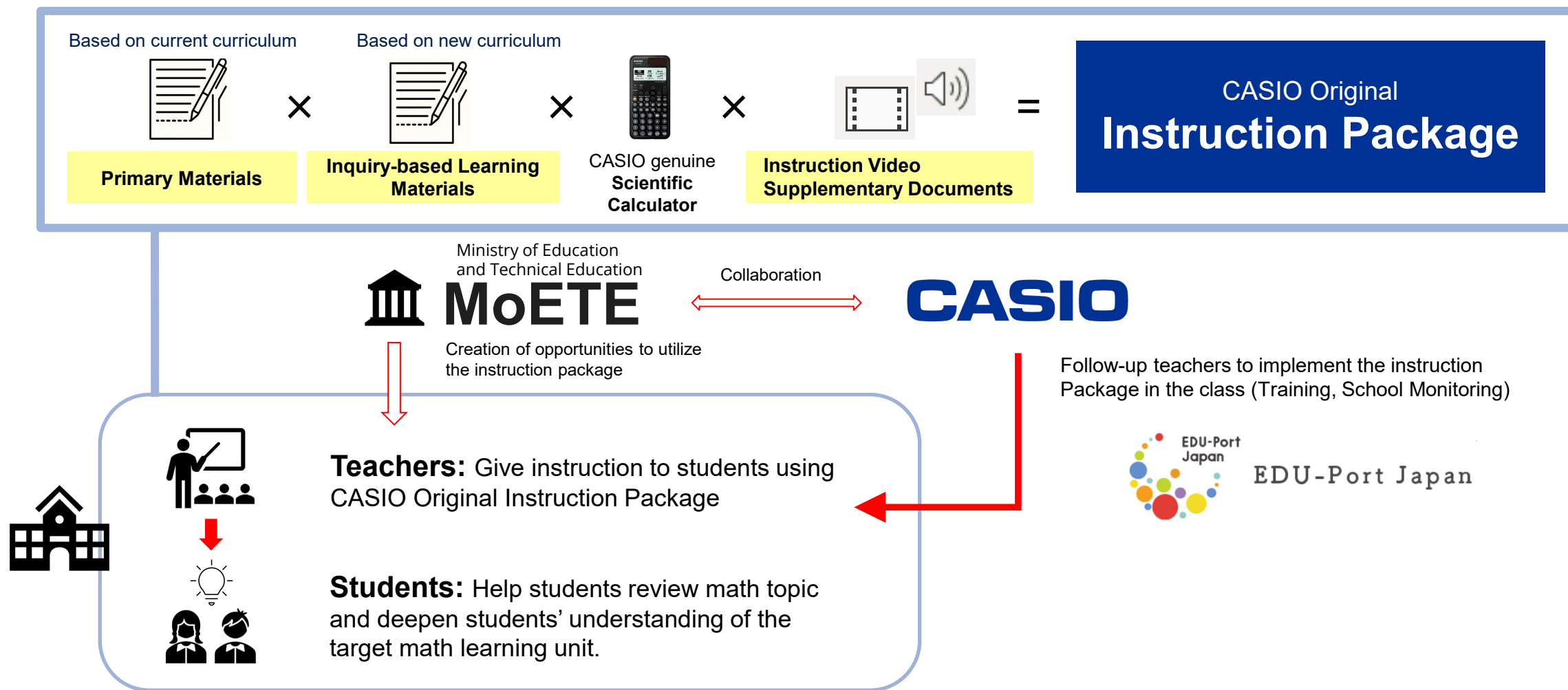
### A collection of questions for teachers to make lessons more interesting

- Includes math problems based on **real-life scenarios**
- Demonstrates how to use scientific calculators in calculations and inquiry-based operations
- Relevant sections can be selected for global use



## 2-(1) Overview of EDU-Port Japan Supported Project

**Creating teaching materials based on both current and new curricula to meet local on-site needs, supporting the long-term transition to inquiry-based instruction**





## 2-(2) History of Partnership with MoETE and EDU-Port Japan Supported Project

**Support was initiated for implementing inquiry-based math lessons using scientific calculators in the new curriculum**

2018–

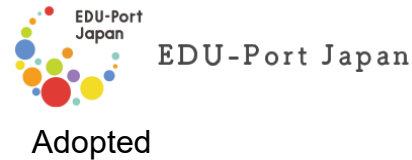
2023–

2025–

### (1) Nationwide training conducted for math teachers in cooperation with PAT\*

\*PAT: The Professional Academy for Teachers. The Ministry of Education's external agency responsible for teacher training, content accreditation, etc.

- All middle school math teachers in Egypt targeted  
Training completed for 23,402 out of 29,140 teachers  
(Training halted before full completion due to the COVID-19 pandemic and structural changes in the Ministry of Education)



Scenes from training at PAT



### (2) Plans in place to begin math teachers training and classroom observations in public schools in collaboration with MoETE

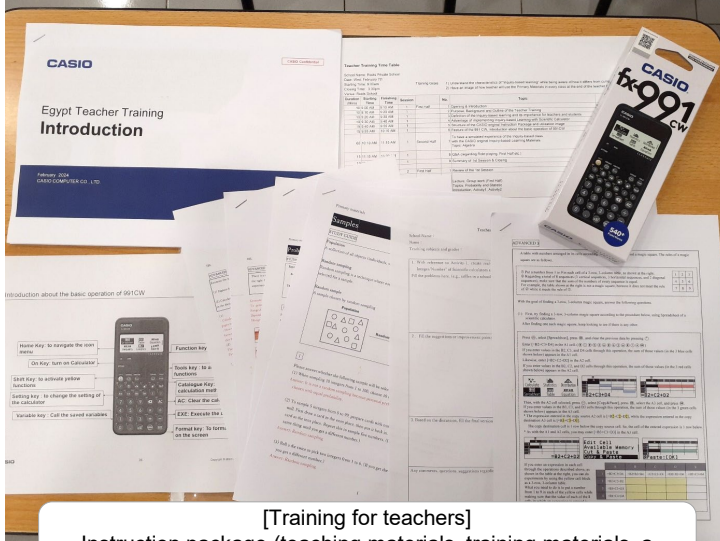
- Support will be provided for implementing inquiry-based math lessons in which students use scientific calculators in the new curriculum.
- As a pilot project, the initial round of support targets 31 teachers from 8 schools in Cairo Governorate.

Advance briefing for principals and targeted teachers





## 2-(3) Training at Private Schools and Workshops at the Department of Mathematics, Faculty of Education, Ain Shams University



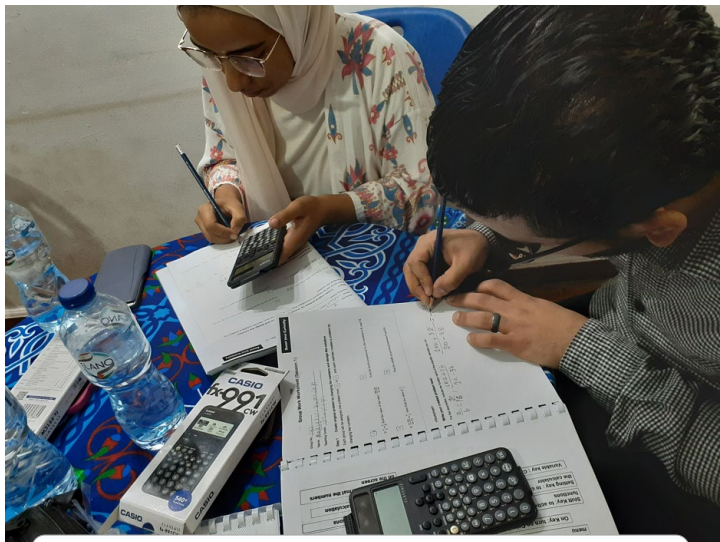
[Training for teachers]  
Instruction package (teaching materials, training materials, a scientific calculator)



[Training for teachers]  
Seats are arranged strategically to promote and facilitate peer learning



[Training for teacher aspirants (Department of Mathematics, Faculty of Education, Ain Shams University)]  
Seating is arranged in groups of small numbers, similar to teacher training



[Training for teachers]  
Group work involving practice problems and self-created questions is adopted



[Training for teachers]  
Seats arranged strategically to promote and facilitate peer learning



[Training for teacher aspirants (Department of Mathematics, Faculty of Education, Ain Shams University)]  
Checking student understanding through in-class guidance



**Based on the results of teacher training at pilot schools,  
we aim to realize inquiry-based classes which students learn proactively aligned with the new curriculum  
in cooperation with the MoETE.**

### **Change in Teachers**

- Creating opportunities for teachers to observe classes each other
- Based on the training, there has been more active discussion among maths teachers about how to implement classes that make effective use of function calculators for various themes.

### **Change in Students**

- by increasing the number of exercises using a scientific calculator, students have more opportunities to learn more proactively, solve problems, and check and reflect on their own answers
- Increased opportunities for students to collaborate and learn from each other in the process of thinking and solving problems

\* In order to extend the above benefits to more students, it is necessary to prepare for teacher training by at least touching on pedagogy and methodology, otherwise it will be difficult to achieve the training goals, and it has been found that the result will be that the training will be completed without being put into practice in the field.

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Thank you for your attention.