



**Asia-Pacific  
Economic Cooperation**

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**2014/SOM1/HRDWG/EDNET/015**

Agenda item: 3.2

## **The International Open Bank of Mathematical Problems**

Purpose: Information

Submitted by: Russia



**Human Resources Development Working Group  
Education Network Meeting  
Ningbo, China  
19-20 February 2014**

## **The International Open Bank of Mathematical Problems**

It is a global tendency that all world economies are becoming increasingly international and increasingly knowledge and data driven. Globalization concerns all economics as well as education, which is a part of economics. Based on that and with accordance of the Joint Statement of Ministers of education at 2012 5<sup>th</sup> APEC Education Ministerial Meeting, the Moscow Center for Continuous Mathematical Education (MCCME) is developing the International Open Bank of mathematical problems, which serves the main goal of creating the International Open Educational Environment and collaboration in the educational sphere (p.10.2 of the Joint Statement). The Open Bank is supposed to grow into a tool of teachers' communication on a school-to-school and people-to-people level. It is developed for convergence and increasing connectivity and mobility of students from different countries.

The project initially has been supposed as multilingual with communications between participants in English and, when applicable, in other languages. This initiative is aimed on experts of school education and school teachers and students around the world and provides them with an open multilingual database of mathematical problems and tools for comparative assessment of learners.

The multilingual database consists of the main area storing problems in English and "Language Mirrors". Each mirror gives an access to mathematical problems posed in a specific language. The set of mirrors is determined by the set of languages of users of the system.

The functioning of the system requires the existence of the central Supervising (Administrative) Group and National Coordinator Groups which support the main database and all mirrors.

At the present time the workgroup from the MCCME has developed a version of the technical part and went on to provide the regulations for users and statistical module.

Now a user gets an access to a set of mathematical problems in two languages (English and Russian), can find specific problems, proceed from a problem condition and solution to a forum where users can discuss the problem and its solution, create a sample of found problems and output it in PDF. An expert user can also use a personal workshop (in a native language) and work in it, communicate with other experts and upload mathematical problems to the workshop or to whole open database.

Recently the International Open Bank of mathematical problems is ready to start as a pilot project.



**The Open Environment**  
A new international approach  
to Educational Collaboration

**The Math Database for Everybody**

**Moscow Center  
For Continuous Mathematical Education**

APEC First Senior Officials' Meeting, 15-28 Feb 2014, Ningbo, China

04.03.2014

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**The general picture**

- Economy is becoming increasingly international and increasingly knowledge and data driven
- Globalization concerns all economics as well as education, which is a part of economics

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Many countries around the world have created national data banks for education and assessment

### WHY IS THIS NOT SUFFICIENT?

1. The majority of those databases are closed. This:
  - leads to misrepresentation of the purposes.
  - generates a number of low-quality materials obtained by plain copying out of the context
2. Evaluation and assessment procedures that run in separate countries are quite different and therefore might be a subject of mutual interest

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## The International Open Bank of mathematical problems

We are building a joint open multilingual database of math problems and assessment methods

The project is being designed and developed on principles of people-to-people, school-to-school interaction



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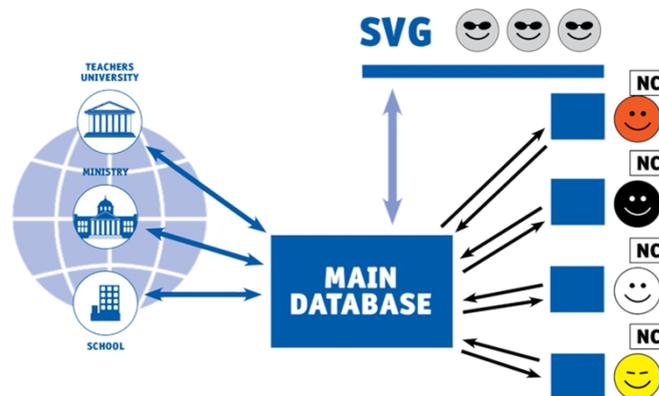
## The Main Principles:

- It is not conventional (we are not forced to accept a conception developed from outside)
- It is adjustable (open toolboxes for making assessments, tests, trainings)
- It is fully open and available any moment
- It provides instant processing and publishing
- It gives living communication on school-to-school or teacher-to-teacher level

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## Contributors, Coordinators and Supervisors



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## The Site of the IOB project

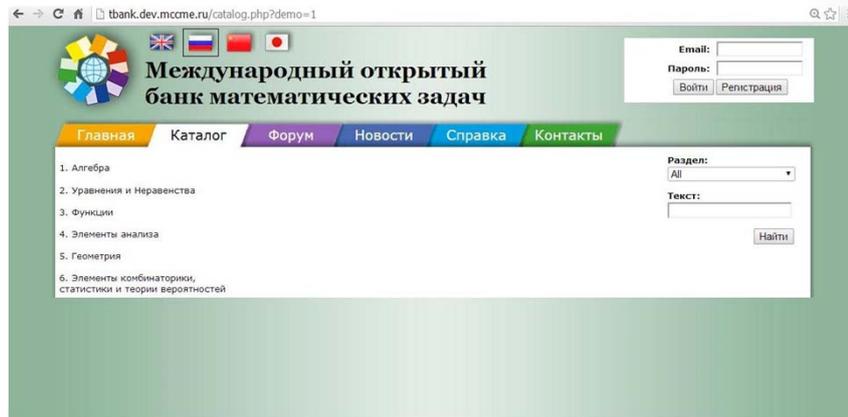
<http://tbank.dev.mccme.ru/>

The screenshot displays the website interface for the International Open Bank of mathematical problems. At the top, there is a navigation bar with links for Home, Problems, Forum, News, Help, and Contacts. Below this, a list of mathematical problems is presented, categorized by subject matter. Each problem entry includes a title, a brief description, and a link to view the problem. A search bar is located on the right side of the page, and a date stamp '04.03.2014' is visible on the right edge of the slide.

## Multilinguality

- We make mirrors of our database in different languages
- Done so far: English, Russian
- Can be extended to: Chinese, Japanese, and further to any language that has TeX support

## The Russian Mirror



## The Site of the IOB project

At the present time a user of this site can:

- Find mathematical problems using the hierarchical structure or context
- Proceed to a forum where users can discuss the problem and its solution
- Create and save a sample of problems
- Use a personal workshop
- Upload problems to a workshop or to the main database

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## Next steps

- More language mirrors
- Creating a space for storing tests descriptions
- Creating a processing module
- Developing an information environment for publications

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## Perspectives

- The project might become
- ... a bridge between different systems of math education
- ... a tool allowing to estimate how well students do math, comparing them to other groups (from a different country or from a neighboring school)
- ... a tool of the influence on the educational policy of a separate school up to a world region

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Thank you for your attention!

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