

Why scholastic abilities, especially in mathematics, decrease.

The drastic results

Urging education in Japan to undergo a fundamental transformation to confront the basic tasks of education and reverse declining scholastic abilities.

1. Decreasing scholastic abilities will lead to societal breakdown in Japan

Bullying among students, parental discipline and other issues are related to the trend of declining scholastic ability. However, the educational issue I am addressing here is a historic turning point with parallels to the era when high educational ideals and a determined will were required by Japanese of the Meiji era to start the diffusion and empowerment of publicly available education provided by the government.

At this juncture, the Ministry of Education, Culture, Sports, Science and Technology is truly responsible for today's failings in education. In 2001 the Ministry of Education, Science and Culture changed its name to the Ministry of Education, Culture, Sports, Science and Technology as part of the reorganization of ministries and agencies. The name of new organization is sometimes abbreviated to the Ministry of Education and Science to emphasize this ministry's role of integrating education and science.

As the nation's educators, the Ministry of Education, Culture, Sports, Science and Technology – the Central Council for Education – Education Committees – Schools are directly responsible for solving educational issues. However, it is not always clear which, among these organizations, is responsible for specific problems ㊦

For example, the Central Council for Education discusses various current issues. By the time a problem occurs, the Education Council has already dispersed and the members belonging to the Central Council for Education are gone.

As well, the top position in the Ministry changes every two years. When a problem occurs, the former Minister is likely the person most responsible. This is a structure that ensures no one is responsible for Japan's educational issues.

School principals diligently perform their duties, trying hard to avoid problems while until they are ready to retire. They have no incentive to publicly disclose any problems that may occur. It is a sad reality that substantial reformation will not occur. That is why Japan will not realize excellence in its public education system.

As educational guidance, the Ministry of Education, Culture, Sports, Science and Technology

developed the Fundamental Law of Education and the Basic Promotional Plan for Education in 2001. These outstanding policies touched the very core of the education. At the time, the importance of the Fundamental Law of Education and the Basic Promotional Plan for Education were recognized not only within the education industry but also by businesses and individuals and the policies seemed to be successful. Then politics and the confusion arising from economic issues impeded the independence of education. Under the name of administrative reform, the will to promote the Fundamental Law of Education and the Basic Promotional Plan for Education in Japan was shaken. I believe the Fundamental Law of Education and the Basic Promotional Plan for Education remain excellent educational policies. The only way to arrest not only prevent decreased scholastic abilities but also improve these abilities is to carry out the Fundamental Law of Education and the Basic Promotional Plan for Education.

There are various educational issues. However, declining scholastic abilities threaten Japan's future in international society by attacking the roots of education.

This is a huge problem attacking the foundation of the Japanese economy. As time passes this problem has the potential for becoming a main factor leading to the destruction of Japan.

Japan must prioritize educational problems among such other issues as safety, economics and politics.

The current situation sees 200 billion yen spent as scholastic abilities decline. Another 100 billion yen is required to stop the decline and 200 billion yen is required to improve abilities. Thus a total of 500 billion yen will be required to address the education problem.

When adults who lack abilities enter society, they generate a burden that affects other people. When the government wants to address issues and enforce its policies, it needs to begin by explaining the meaning of policies to gain understanding among the public. This will cost a considerable amount of money.

If someone educated in Japan cannot function in a highly skilled labor force, companies will have to hire non-Japanese people. This will lead to a manpower structure in which Japan's industry and technologies become supported by non-Japanese.

As well the health of elderly Japanese will be adversely affected if they do not have opportunities exercise their mental faculties. This will inevitably lead to rising welfare costs required for the support of seniors.

In less than 20 years Japan will lose its knowledge-based competitive advantage in the world.

2. Mathematical ability is the source of the nation's power

When broadly examining international society, information society and economic society, the underlying power is mathematical ability. Mathematical ability will underpin the knowledge society

of the twenty-first century.

Mathematical ability is also a hidden economic problem. Seeking safety and security is fundamental to dealing with today's international society. The real issue in the information society is to be able to clearly distinguish between reality and virtual reality.

In general, focusing on mathematical education is the most effective way to improve the ability of individuals to survive and ensure the power of the nation of Japan.

Strengthening the mathematical abilities of the nation is a shortcut to solving the fundamental problems Japan faces.

Japan is neglecting mathematical education. A few years ago the United States established educational strategies promoting mathematical education as the root of national security. There has been no such among Japanese politicians and administrative organs.

International research frequently highlights the primary importance of mathematical ability. Mathematical ability is often used as a measure of potential among nations of the world. Japanese language ability will not be used to benchmark the power of a nation.

Nonetheless, the Ministry of Education, Culture, Sports, Science and Technology does not realize that building mathematical ability is fundamental and basic. Do they no longer accept responsibility for education? Or has it become a second-tier Ministry, with no one of courage to point out its mistakes or shortcomings? Can we entrust the Ministry of Education, Culture, Sports, Science and Technology with the administration of our educational system in the 21st century?

There are some educational administrators in local governments who realize the fundamental and basic importance of mathematical ability. Local educational administrators may be our only hope. People or organizations that emphasize improving mathematical abilities are an important start. It may be hard to move an entire nation at once. So local-level possibilities should begin the trend.

Failing this, we may not be able to keep pace with advancements overseas.

Mathematical ability is the primary source of a nation's power in the 21st century. It is important that people who realize this be the first to step in the process.

Recently many of the companies sponsoring professional baseball are from the IT software industry sector.

Countries with leading IT industries include China and India, both densely populated. Both countries also rank high in the world for mathematical ability. Japan claims to be firmly established as a creative technology leader and yet we give scant attention to mathematical education.

Unless we find a solution to our country's poor mathematical education system, Japan will surely begin to trail behind other nations in the near future.

3. Why does mathematical education have no budgetary appropriation?

In Japan, there may be a chief of the Science Center but there is no chief of the Mathematical

Education Center. When talking about science in education, the sciences come first followed by mathematics. Science requires experimentation equipment and tools. Therefore, it readily acquires budgetary appropriations.

Contrarily, people believe mathematics requires only pencil and paper, so mathematics receives no budgetary appropriations.

There are departments of science, arithmetic and mathematics in the Central Council for Education. In the Council too science comes first, then arithmetic and last comes mathematics. Mathematics is placed last and it comes after arithmetic.

This indicates how our country considers mathematical education. Reevaluating the importance of mathematical education can be only achieved by reorganizing the flow of the mathematical education while focusing on consistency. Until we complete this, our mathematical ability will continue to decrease. Then it will result in the collapse of our nation.

I want to emphasize that mathematics is the most necessary and cost intensive area of study. Saying that only paper and pencil are needed for mathematics explains the process that can be achieved but most costs goes towards labor. This also means it takes considerable time to educate people.

I would like people to understand that mathematical education requires time and money.

4. Arithmetic should be integrated into mathematics

I claim that arithmetic should be integrated into mathematics. Education should be consistent through the elementary school to university. There is no reason to use the name arithmetic in elementary education. There is no difference between arithmetic education and mathematical education.

One of the major causes of lower mathematical ability in Japan is the division between arithmetic and mathematical education. People think elementary school instructors teach arithmetic. They think teachers with a background in liberal arts can instruct arithmetic. They think arithmetic is different from mathematics. Many people probably recognize these contradictions but remain silent.

Mathematical educators themselves instruct faculty of education students to teach arithmetic, Japanese language, science and social studies. Mathematical educators contribute to the development of elementary teachers. It is difficult for them to object to what they are doing. Elementary school teachers think they can teach arithmetic even though they didn't like studying mathematics. This misunderstanding is a contradiction.

As I explained earlier, even though we are in an era that requires consistent mathematical education from elementary school to junior high school, high school and university, we still teach arithmetic and mathematics separately. Moreover, the elementary teachers who are not good at mathematics instruct mathematics. This irrationality urgently needs to be remedied.

5. Timing of scholastic ability decline

Until grade three, students like arithmetic. By the time they reach grade five, half of them dislike arithmetic. In grade eight, 70 percent of students lose interest in studying mathematics. It is hardly surprising students in high school don't want any instruction in mathematics at all.

Looking at course contents, studying fractions in grade five and proving basic figures in grade eight produce a large number of students who don't understand arithmetic and mathematics.

The number of students who dislike mathematics will increase year after year thanks to teachers who dislike mathematics or feel uncertain about their abilities in mathematics.

6. The relationship between mathematician, mathematical educator and engineer

Mathematicians who explore the depths of mathematics tend to look down upon mathematicians who are interested in education. This means many mathematicians seem to have a low opinion of education. Mathematical educators feel mathematicians often don't understand education. In Japan mathematicians seem to be neglected by many engineers because the mathematicians don't answer practical questions such as how mathematics can be applied and because engineers don't search for potential applications of mathematics. I personally believe that in the 21st century mathematics will be applied to an ever expanding range of fields and endeavors.

Mathematical educators seem to realize these issues and practice mathematical education based on the fundamentals of mathematics.

Although not yet mainstream, the 21st century trend towards seeking the necessary mathematical education has just begun in a mainly ad hoc and uncoordinated process.

7. Mathematics is the standard language of science and technology

Mathematics is not only the standard language of science and technology it is also the world's standard language. If our standard language is neglected our standard of science and technology will decline and Japan's international standing will be lost.

Mastering this standard language is essential to ensuring our safety and security. Considering this, we must establish the purpose of mathematical education to be our safety and security and design plans accordingly.

Maintaining mathematical ability is a cornerstone of Japan's security. Maintaining mathematical ability is vital to solving long-term economic issues.

Maintaining mathematical ability is the country's knowledge based lifeline towards establishing a creative technological environment.

8. New mathematical education programs

When designing mathematical education programs aimed at ensuring safety and security, I

recommend general ideas embracing such key words as relationship, position, comparison and selection.

For example, the width of road or the speed of vehicle can be estimated by the relationship between people in the vehicle and the road. Many electrical products are manufactured overseas and then imported into Japan. To use these products safely, we choose products that reflect our lifestyles. People manufacturing goods intended for import to Japan need to understand our concerns for safety and quality. The relationship between consumers and manufactures help establish opinions and attitudes toward products. Quality characteristics such as color, design, ease of use and security can be used to create products based on the keyword of relationship. Targeting mathematical education should be considered a global necessity.

Consider choices. Young people do not place much importance on choices. However, as we get older choices can provide a sense of security.

These choices represent a question of possibility or probability that can be prediction of the future. Mathematical education in 21st century should include the view of life-long learning. Suken continues to seek innovative approaches to mathematical education.

9. Summary

If mathematics is the knowledge foundation of today's civilization, there should be a mathematics research institute and a mathematical education research institute. Governmental budget apportions should equal the total amount of other departments. Each research institute will require approximately 50 billion yen.

The Ministry of Education, Culture, Sports, Science and Technology should focus on consistent mathematical instruction from elementary school to high school with fundamental and basic mathematical education in an international environment. The word 'arithmetic' is unnecessary.

Since Japan is the country that best uses the Japanese language, it is our responsibility to retain the historical and international importance of our language. Thus we must also emphasize Japanese language education.

As part of our education strategy, we will use mathematics to instruct the people of developing countries. We should accept overseas students not by their Japanese language ability but by their mathematical ability.

Moreover, to maintain the mental faculties of the elderly, life-long learning should be considered part of mathematical education. For example, people who are 65 years old should be accepted for re-entry into the nearest university. Financial incentives such as discount health insurance premiums could provide incentive for the elderly to reach their learning goals.

Society in the 21st century faces the challenge of creating a re-vitalized country full of knowledge. Perhaps one day the Minister of Education, Culture, Sports, Science and Technology will have a

background in engineering. With the advantages available to the current educational administration, I expect a large scale changes in education to be evident in the near future.