bleibt uns nur übrig, die Gemeinschaft der Mathematikdidaktiker um Unterstützung zu bitten.

Helfen Sie uns:

1. bei der Erstellung von Referaten
2. durch Werbung im Ausland für unsere einmaligen Informationsdienste
3. bei Ihrer Publikations-/Herausgebertätigkeit durch Voranstellen eines aussagekräftigen Abstracts.

1. Mitarbeit bei der Dokumentation.

Es gibt weltweit ca. 200 Zeitschriften, die sich ausschließlich mit Theorie und Praxis des Mathematikunterrichts und verwandter Gebiete beschäftigen. Deren Artikel, vielfach ohne Abstract oder Kurzreferat, müssen gelesen, verstanden und beschrieben werden. Und das häufig in Sprachen wie Spanisch, Niederländisch oder Russisch. Einige Kolleginnen und Kollegen unterstützen uns bereits bei dieser Arbeit, indem sie sich für ein oder zwei Zeitschriften verantwortlich fühlen und uns in regelmäßigen Abständen Kurzreferate zu darin enthaltenen Artikeln zur Verfügung stellen. Wenn Sie noch nicht zu diesem Kreis gehören, uns jedoch auch bei dieser Auswertungsarbeit unterstützen wollen, sind Sie herzlich eingeladen, dazuzustoßen. Zeitschriften aus England, Frankreich, Finnland,... mit verschiedenen Schwerpunkten warten auf Abnehmer. Als kleines Dankeschön bleiben die ausgewählten Zeitschriften in Ihrem Besitz. Außerdem können wir Ihnen eine CD-ROM MATHDI anbieten.

Haben Sie Interesse? Wir stellen Ihnen gern unser "Zeitschriftenangebot" zur Verfügung.

2. Mithilfe bei einer erhöhten Nutzung

ZDM/MATHDI werden noch nicht so genutzt, dass man von einer befriedigenden Akzeptanz unserer Informationsdienste in der mathematics education community sprechen kann. Die deutschen Hochschulen mit Lehrerausbildung haben zwar weitgehend ZDM und/oder MATHDI abonniert (leider noch nicht alle!), aber im Ausland sind wir noch zu wenig bekannt - oder man geht davon aus, dass es sich hier um einen deutschen Nachweisdienst handelt, der nur ausgewählte ausländische Literatur berücksichtigt.

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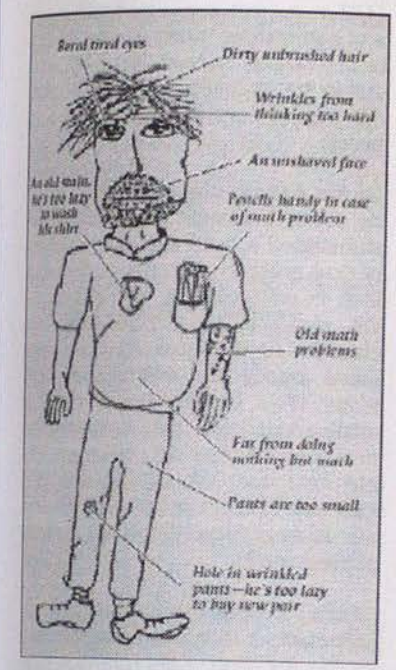
Nur wenn wir alle zusammen zeigen, dass ZDM/MATHDI auch tatsächlich gebraucht, also vielfältig genutzt wird, kann die Existenz dieses weltweit einmaligen Informationsdienstes gewährleistet werden.

Liebe Kolleginnen und Kollegen,
wir hoffen auf Ihr Verständnis für diesen Appell und freuen uns auf Ihre Reaktion. ZDM/MATHDI ist für Mathematikdidaktiker in Lehre und Forschung aufgebaut worden und soll für Sie weiterentwickelt werden. Betrachten Sie diesen Dienst auch als Ihre Aufgabe und wirken Sie bei den zukünftigen Aufgaben aktiv mit, damit auch die heranwachsende Generation unseres Faches davon profitieren kann.

INTERNATIONAL REVIEW



Pupils Sum up Maths Teachers as Fat Nerds

Simon de Bruxelles

MATHEMATICIANS are fat, scruffy and have no friends - in any language. Youngsters from seven countries, asked to come up with a portrait of the typical mathematician, showed a badly dressed, middle-aged nerd with no social life.

Schoolchildren as far apart as Romania, England and America took part in the study conducted by a researcher from the Centre for Teaching Mathematics at Plymouth University. The 300 children, aged 12 and 13, also drew pen and ink portraits of the "archetypal mathematician".

One English pupil added a caption that read: "Mathematicians have no friends, except other mathematicians, not married or seeing anyone, usually fat, very unstylish, wrinkles in their forehead from thinking so hard, no social life whatsoever, 30 years old, a very short temper."

Most children drew white men with glasses, often with a beard, bald head or weird hair, and shirt pockets filled with pens, who were working at a blackboard or computer. Finnish children had an even more disturbing view of maths teachers: several portrayed them forcing children to do sums at gunpoint. The study has raised concern that the widespread contempt in which children hold maths teachers may deter talented teenagers from studying the subject. John Berry, whose department ran the project, said: "Overall, the image we got from young people was a very negative one towards mathematicians and their role. Children did not have much idea of what mathematics was or what mathematicians do. We were surprised the image was fairly common in all countries, even those like Romania where maths teaching is very successful."

He added: "The image of mathematicians was nerdish and one worrying aspect is that children may be put off studying maths if they think others will see them as being nerds."

It was with some relief that he was able to report: "As a mathematician myself, working in a mathematics environment, I do not recognise them at all. One of the reasons we did the research was because of the negative attitudes people have towards mathematics and mathematicians."

He was forced to admit that being a mathematician did little for his social life. "If you are at a party and tell people you're a mathematician, it's the worst turn-off you can imagine," he said.

Researchers will now look at ways to give mathematicians a more positive [image]. Susan Picker, an American Phd student who conducted the research, said: "All maths teachers who have seen these images at first found them amusing but soon realised that this is how their students see them, and it is a sobering thought.

"We would like to see businesses promoting the positive side of mathematics and showing how many of those who study it go on to become researchers, engineers, computer programmers and so on."

Comment in the Christian Science Monitor, Friday, January 12, 2001. See http://www.csmonitor.com/sections/learning/p-learning.html

Drawing some Math Conclusions

Amelia Newcomb

FOR a subject associated with nerds and bad hairdos, math attracts its share of attention. Indeed, last week, interest in the oft-maligned discipline covered ground from the Pacific to the Atlantic.

On the eastern side of this span, a study out of England's Plymouth University started a buzz with its revelations of how children perceive mathematicians. In all likelihood, this is because the students, who hailed from five countries (and not just ones where kids score poorly on international math tests), drew images that reveal what many adults think: that math is mysterious and appeals only to people who are ... different. Who like solitude. Who look like Einstein. Who know the answer to everything. Who are dauntingly single-minded.

Those perceptions may shed light on a proposal put forth on the western side of this equation. California Gov. Gray Davis's administration estimates the state will need almost 1,300 more algebra teachers over the next three years, as schools boost instruction of the subject. Governor Davis is eyeing financial incentives for schools to expand algebra classes and attract new teachers.

It may be a tough search, given that a lot of onetime candidates likely opted out of being labeled a nerd, not to mention that many who stuck with math want a better salary than teaching offers. According to Susan Picker, who did much of the British study's research and is a staff developer

in New York City schools, few children have any idea of the possibilities open to mathematicians. So along with any budgets for greater math instruction should come that most ubiquitous of American activities: a PR campaign. Maybe then, in the future, it'll all add up.

From The Times [e-Services], Wednesday, January 3, 2001. See http://www.thetimes.co.uk/article/0,,2-61352,00.html

Study: Ability of Primary Schoolers on wane

Jerry Becker

THE mathematical ability of primary school students has fallen significantly since the introduction 20 years ago of a more flexible, pressure-free education system, according to the findings of a recent survey.

The findings are based on the answers to test questions that have been used on two previous occasions. Thus, the relationship between the lighter workload for students and their lower academic abilities is likely to spark debate during the run-up to the implementation in the 2002 academic year of study guidelines that advocate a 30 percent reduction in textbook content.
The survey was conducted by a team that used the same set of 17 questions that the Education Science and Technology Ministry used in 1982 and 1994, which tested basic calculation abilities in decimals and fractions.

About 1,300 primary school students who had average scholastic abilities took the latest test in 11 prefectures in December. Their answers, compared to the previous tests, showed a continuing decline in scholastic ability.

When the test was first given in 1982, the average correct answer ratio was 69 percent. By 1994, it had dipped slightly to 65 percent. But in the last test, it sunk to 58 percent.
In contrast, a similar comparative test of mathematical ability of second-year middle school students conducted by the ministry in 1983, 1995 and 2000 produced average correct answers of 66 percent, 71 percent and 70 percent, respectively.

However, in that survey it was noted that the abilities of second-year middle school students to calculate inequalities had dipped substantially, indicating that poor primary school abilities were carried over to middle school.

Opinions are mixed among educators over whether there is adequate data to prove that the academic abilities of students have fallen since the introduction of the new education system.
One of the team, Prof. Toshio Sawada of Science University of Tokyo, said he was surprised to learn the scholastic abilities of primary school students had fallen so low. He added that students did not seem to have do the same questions repeatedly until they get it right. He said that the public should take deteriorating academic standards among primary school students as a wake-up call and that it would be counterproductive to lessen the content of their textbooks.

Japan Wants Its Students to Learn - for the Joy of It

Mark Magnier

- The nation's youths may excel in math and science, but their hearts aren't in it. A revised curriculum due out by next year seeks to change that -

TOKYO - There's no joy in Mathville. Even as Americans - led by their self-proclaimed education president - fret over science and math scores and weak basics, Japanese are wringing their hands over their lack of joy, zest and fun.

Japan's perceived delight deficit was highlighted by the release of a comparative international education survey. Although eighth-graders here ranked comfortably near the top, as usual, for their ability to solve math and science problems, parents and educators were startled to see just how much the students hated these subjects.

"Everyone was really quite taken aback," said Katsuhiko Maeda, senior curriculum specialist with the Education Ministry, "especially because our students are so good at math and science."

The survey issued in December by the Amsterdam-based International Assn. for the Evaluation of Educational Achievement ranked Japan's students No. 36 out of the 37 nations surveyed for their interest in math - just above Moldova - and No. 22 out of 23 for their interest in science.

Fun and enjoyment are not commonly associated with education in a nation famous for its"entrance exam hell," rote learning and bullying. It's not uncommon for Japanese junior high students to attend regular classes and special cram schools from 8 in the morning until 10:30 or 11 at night.

"I absolutely hate both math and science," said Risa Sekikawa, a 15-year-old who attends a Tokyo high school. "I don't like science experiments, and I hate arithmetic because I can't understand anything they're saying in class."

Although students everywhere like to complain about school, Japanese parents and educators fear that such widespread erosion of enjoyment will lead to a sharp drop in standards. And for traditionalists, that spells disaster, given this nation's reputation for world-class products and its heavy reliance on applied science and engineering.

In response, the Education Ministry is touting a revised curriculum due out by next year that will encourage flexibility, "education of the heart" and ikiruchikara, or "zest for living."

The plan calls for more electives, a five-day school week - down from six - and at least three hours a week of flexible time.

Behind the debate over how to make fractions fun and experiments exciting is a broad-based fear that Japan is not producing the type of graduates required in the 21st century. Japan's rigorous conformity and centralized education policies arguably served the nation well during the economic boom years, when it needed a relatively uniform work force for its factories and corporate ranks.

But globalization has placed a premium on imaginative individuals able to question authority and reason through problems. These abilities, many believe, are not tolerated - and so, hardly encouraged - in the education system.

In spite of its new, soft approach, the Education Ministry is as control-oriented as ever, critics say. Kazuo Nishimura, a math professor at Kyoto University and head of a group opposed to the new curriculum, says the bureaucrats are way too meddlesome in some areas and way too relaxed in others.

On the one hand, large class size and rigid standards still leave little room for local autonomy or diversity. On the other, textbooks have been dumbed down, with most explanations, difficult problems or sample exercises removed, he says. And the number of hours spent in class is among the lowest for industrialized nations - and getting lower, he adds.

"'Zest for living' sounds nice, but their policy is actually quite the opposite," Nishimura says. "There's a crisis in Japanese education. The entire system isn't working well."

As with education issues in many countries, there has been lots of finger-pointing. Some experts blame politicians for promising reform and not carrying through. Others knock parents for not fostering a love of learning, teachers for a shortage of imagination and schools for their lack of accountability.

As their elders debate their future, students like 16-year-old Tatsuo Sakai grapple with their equations and reagents despite their avowed lack of interest.

"If I had my way, I wouldn't take math and science at all," says Tatsuo, the son of a math teacher. "I can't see how it's going to be useful. I just want an easy life completely free of all this complex stuff."

From the Los Angeles Times, Friday, February 9, 2001. See http://www.latimes.com/news/learning/20010209/t000011937.html

Singapore In TIMSS-R

Singapore Ministry of Education

SINGAPORE has emerged first in Mathematics in a 38-country survey of grade eight (Secondary Two) students in mathematics and science conducted in 1998-99. Singapore is ranked second in Science. The excellent results are testimony to the high quality of Mathematics and Science education in Singapore. The significant value which parents and the community place on education, the excellent work of our teachers and principals, the high access to IT and other resources at home and in school, the rigorous curriculum in Singapore schools are among the key factors contributing to Singapore's good performance.

These results were released in the Third International Mathematics and Science Study 1999 (TIMSS 1999). It covered a representative sample of 5,000 Secondary Two students from all courses - Special, Express, Normal (Academic) and Normal (Technical). The study replicated an earlier study (TIMSS 1995) conducted in 1994.

Key Findings – Quantitative -

Most Students in International Top Half

Singapore is first in mathematics and second in science for TIMSS 1999 (see Table1 at http://www.gov.sg/sgip/Announce/SgEduc.htm).

Most Singapore students are in the international top half. 93% and 80% of our students are in the international top half for Mathematics and Science respectively (see Table 2 at http://www.gov.sg/sgip/Announce/SgEduc.htm).

A high proportion of Singapore students are also able to achieve excellent results. 46% and 32% of our students reached the international top 10% in Mathematics and Science respectively.

There were sufficient data to analyse the performance of Chinese and Malay students. For mathematics, 96% of our Chinese students are in the international top half while 83% of our Malay students are in the international top half. For science, 86% of our Chinese students and 61% of our Malay students respectively are in the international top half.

- Consistent Good Performance -

The consistent good performance of students at both TIMSS 1995 and TIMSS 1999 shows sustained academic excellence in mathematics and science.

Singapore's Secondary Two students have consistently performed among the top in mathematics and science for both TIMSS 1995 and TIMSS 1999.

Tracking the performance of the same cohort of students who were in Primary Four for TIMSS 1995 and in Secondary Two for TIMSS 1999, Singapore students have progressed remarkably in the course of four years in both Mathematics and Science.

For Mathematics, Singapore students who were top in TIMSS 1995 at Primary Four still maintain their top position in TIMSS 1999 at Secondary Two.

For Science, Singapore Primary Four pupils who were ranked 7th in TIMSS 1995 have moved to a higher ranked position of 2nd at Secondary Two in TIMSS 1999. Science is taught in our primary schools only from Primary Three, instead of Primary One as in most of the other countries.

- Key Findings – Qualitative -

The study also identified several interlocking factors which helped Singapore to sustain its top positions:

- Positive Attitude -

Our students not only perform well, but also have a positive attitude towards mathematics and science. 86% and 79% of Singapore students like mathematics and science respectively, in contrast to about half of the students in other top performing countries like Korea and Japan. Our students also regard doing well in mathematics, science and languages as important.

- Good Home Support -

Our students have good access to home educational resources, particularly computers. 80% of the students report that they have a computer at home. This is an increase from the 50% of students who reported similarly in TIMSS 1995. The percentage is also among the highest internationally.

- Committed Teachers, Good School Organisation and Availability of School Resources -

The commitment and hard work of teachers and principals is evident in the time and effort spent in planning lessons, marking students' work and other tasks.

Compared to schools in the other countries, fewer schools report that absenteeism, late coming and discipline problems are serious.

Singapore schools have higher availability of resources for instruction, compared to schools in the other countries. Resources surveyed include instructional materials, budget for supplies, school buildings and grounds, instructional space, computers, library materials and audio-visual resources. Singapore stands out in having a relatively high proportion of students reporting that the computer is used at least once in a while in their mathematics (54%) and science (46%) classes. Internationally, the use of computers in class is not prevalent.

- Rigorous Curriculum -

The mathematics and science curriculum in Singapore has been found to be more comprehensive than that of many countries. About 80% or more of the topics listed in the curriculum framework for TIMSS 1999 are expected to be taught to Secondary Two students in Singapore, higher than international averages. Singapore's rigorous curriculum is continually reviewed to ensure that it remains relevant for our students. Singapore also has an efficient system to implement the curriculum comprehensively across all schools.

- Background -

The study was conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). IEA is an international authority on the study of educational standards and it has more than 50 institutional members including countries like Canada, England, Japan, Singapore and the United States. Chinese Taipei and Malaysia were among the newcomers to the 1999 study.

In Oct 1998, 5,000 Secondary Two students from all secondary schools in Singapore took part in the survey, along with 180,000 students from around the world. Students in all courses, i.e. Special, Express, Normal (Academic) and Normal (Technical), participated in TIMSS 1999.

For TIMSS 1995, which tested at Primary Three, Primary Four, Secondary One and Secondary Two levels, Singapore ranked first at Secondary One and Two in both mathematics and science. At Primary Three and Four, Singapore ranked second and first in mathematics respectively and seventh in science.

From the TIMSS-Forum [December 29, 2000], Patsy Wang-Iverson and Bill Jackson, and the Singapore Ministry of Education. See http://www.gov.sg/sgip/Announce/SgEduc.htm

TIMSS-R Results Released

US-Ministry of Education Press

- U.S. Eighth Graders Above International Average in Math, Science –

COMPARED with students in 37 other participating nations, U.S. eighth-grade students are above the international average in mathematics and science-performance, according to the Third International Mathematics and Science Study-Repeat (TIMSS-R).

"Our students are successfully learning more math and science every year they're in school," said U.S. Secretary of Education Richard W. Riley, "but we can do even better. For example, the Glenn Commission gave us some very

significant, bold steps we can take in the teaching of math and science from elementary through high school, ranging from improving the professional development of K-12 teachers, to widening the pipeline of people going into math and science teaching, to retaining those teachers once we get them in the pipeline."

The U.S. Department of Education's National Center for Education Statistics (NCES) released the results today in a report entitled Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement from a U.S. Perspective, 1995 and 1999. The study, sponsored by NCES and the National Science Foundation (NSF) in the United States and by the International Association for the Evaluation of Educational Achievement (IEA), assessed eighth-graders' knowledge of mathematics and science in 38 nations. It follows up on the Third International Mathematics and Science Study conducted in 1995.

In 1999, for mathematics, U.S. students performed better than the international average in fractions and number sense; data representation, analysis, and probability; and algebra. They performed at the international average in measurement and geometry.

In science, the average score of U.S. eighth-graders was higher than the international average in earth science; life science; chemistry; environmental and resource issues; and scientific inquiry and the nature of science. U.S. eighth-graders performed at the international average in physics.

The performance of U.S. eighth-graders in mathematics and science was about the same in 1999 as in 1995.

Because its predecessor study TIMSS reported on fourth-graders, TIMSS-R offers a unique opportunity to compare the performance of fourth-graders in 1995 with the performance of eighth-graders in 1999. The results indicate that the relative performance for eighth-grade students in mathematics and science was lower in TIMSS-R (1999) than it was for fourth-grade students four years earlier in TIMSS (1995).

"This finding validates the results of the previous 1995 study that after the fourth-grade, students in the United States fall behind their international peers as they pass through the school system," notes Dr. Gary Phillips, acting commissioner of education statistics. "The lack of improvement is consistent with findings from recent administrations of the Long Term Trend assessment from the National Assessment of Educational Progress. However, over a much longer time span there have been improvements in the U.S. in both math and science." Riley added that four years may not be enough time to register the effectiveness of education reforms.

TIMSS-R also examined the performance of different groups of U.S. students and their performance. Those findings show no evidence of a difference between eighth-grade girls and boys in mathematics in 1999, although boys performed better than girls in science. African-American students increased their achievement in mathematics from 1995 to 1999, but not in science. There was little change in the performance of white or Hispanic students in mathematics or science, although white students continue to

score higher in both subjects than black or Hispanic students.

In addition to measuring student performance in mathematics and science, the TIMSS-R study also looked at students' study habits and activities in the classroom and at teachers' instructional practices, academic and professional preparation, and beliefs about their teaching abilities. Findings indicate that:

U.S. eighth-grade students were more likely than students in other nations to be taught by teachers who majored in education, as likely as others to be taught by teachers who majored in mathematics education, and less likely than their international peers to be taught mathematics by teachers who majored in mathematics.

U.S. eighth-grade students were more likely to be taught by a science teacher with a degree in education, as likely as their international peers to be taught science by teachers with a college major or main area of student in biology, chemistry or science education, and less likely to be taught science by teachers with a degree in physics.

"It's apparent," Riley said, "that we need to make a major investment in upgrading teacher skills in math, science and other subjects. That's something we can do immediately. Our new education budget - which we are hoping the Congress will pass later this week - includes funding for smaller classes to start kids off right, recruitment and preparation of teachers, upgrading the skills of the current teaching force, GEAR-UP to prepare more students for college, and after-school programs to provide students with increased course enrichment."

In both mathematics and science, U.S. students reported more often than students in other nations that they use class time to begin homework. Seventy-four percent of U.S. eighth-grade mathematics students reported often beginning homework in class compared to the international average of 42 percent; 57 percent of science students reported often beginning homework compared to the international average of 41 percent.

Acting Commissioner Phillips commented that "TIMSS-R is a learning experience that points to our nation's strengths and challenges, and provides us with an international perspective on possible reasons for differences in academic achievement." He noted that today's report shows only the initial findings from a more complex study. Next year NCES will release three additional reports covering a classroom video study in 7 nations, a benchmarking study which reports on the relative performance of 13 states and 14 school districts in the United States, and a linking study between the National Assessment of Educational Progress and TIMSS-R.

The Third International Mathematics and Science Study-Repeat (TIMSS-R) examines information on mathematics and science achievement, schooling, curricula, instruction, and the lives of teachers and students from 38 nations. TIMSS-R continues the tradition of U.S. participation in international comparative education studies and, most importantly, allows the United States to chart trends in eighth-grade mathematics and science achievement in an international context over time. TIMSS-R is a collaborative effort by the National Center for Education Statistics (NCES), the National Science Foundation (NSF)

and the Office of Educational Research and Improvement (OERI).
(NOTE: Copies of the TIMSS-R results are available on request and on the NCES Web site at http://nces.ed.gov/timss. For general information on TIMSS and TIMSS-R, please visit the NCES Web site, contact the TIMSS customer service number at 202/502-7421, or send e-mail to timss@ed.gov)

A Look At Our Schools vs. Theirs: Averages That Hide The True Extremes

David C. Berliner

NOT many weeks ago, the TIMSS-R data were released. That's edu-speak for the Third International Mathematics and Science Study-Repeat. The United States came out about average among the 38 competing nations whose eighth-graders took the tests, ranking only 19th in mathematics and 18th in science. In the United States, that is unacceptable. So the alarm - "The sky is falling!" - was sounded across our land, just as it was five years previously when the original TIMSS was reported.

Prestigious leaders of government and industry are once again claiming that American students can't compete in the new economy; once again, they are predicting economic ruin. Our new president believes these Jeremiahs and told us last week how he will save America's failing public schools. But President Bush apparently doesn't understand history or data.

For a history lesson, let us recall Adm. Hyman Rickover, developer of our nuclear navy, and former president Ronald Reagan. Public school failure was their theme, too, though they were not alone and were joined by many Democrats.

But just in case nobody noticed, Rickover's lazy and unfit students of the 1950s, students who supposedly couldn't read or think and were doomed to lose the arms race, now are in charge of most of the nation's important government agencies and corporations. Those 1950s dum-dums haven't done too badly in terms of national defense, economic productivity or positioning America for a bright future.

And Reagan's indictment of our schools as responsible for making us "A Nation at Risk" now seems laughable. Instead, we have built the world's strongest economy. American workers in manufacturing, service and agriculture attain the highest rates of productivity in the world. These achievements are the results of the creativity and work ethic of Reagan's hordes of mediocre school children, spawned by Rickover's inadequate parents! Enough. The sky is not falling on America.

Data from the TIMSS-R told us something easily predicted: Large governmental and corporate bureaucracies do not change rapidly. The original TIMSS informed us that American fourth- and eighth-graders scored at about the same level as those in 41 other nations, but well below some Asian nations in math and science. The repeat of TIMSS showed the same trend. Since the United States has 15,000 or more school districts, with 15,000 funding formulas, and 15,000 curriculum committees and school boards, it should have been obvious

that change would not occur quickly. Because our nation's public schools are run by local authorities, it was wasted effort to repeat TIMSS so soon after the 1995 studies.

Furthermore, TIMSS-R confirms a point many of us have long believed: Not all our schools should change. Despite the doomsayers, some of our schools are doing fine. The U.S. average masks the scores of students from terrific public schools and hides the scores of students attending shamefully inadequate schools.

Let's take Illinois as an example. Along Lake Michigan, north of Chicago, are 20 public school districts serving predominantly wealthy suburban families. They gained permission to compete in TIMSS as a separate nation. Statistically, these public school students are on a par with the top scorers internationally in mathematics and science. Improving public schools where students are doing this well would be difficult. And this kind of spectacular performance is overlooked by those who claim that our schools are not working - the result of looking only at average U.S. achievement.

Now let us focus on southern Illinois, where East St. Louis is located. For decades, this community has been served by dismal schools - an embarrassment to a nation as rich as ours. Yet any good, random sample of U.S. schools for any international assessments includes both kinds of districts, those similar to East St. Louis and those that resemble the North Shore of Chicago. Put them together, and you hide important distinctions between schools in different communities.
The same sorts of distinctions exist among the states, as well, when you separate out the statistics. In TIMSS, at the eighth-grade level among the 41 nations, 32 nations statistically outscored Louisiana in mathematics. Worse, 36 nations outscored the District of Columbia. But only six nations in the world beat Iowa and Nebraska in mathematics. In science, 26 nations outperformed Mississippi, and 37 nations beat the District. But only one nation, Singapore, scored above Colorado, Connecticut, Iowa, Maine, Massachusetts, Minnesota, Montana, Nebraska, North Dakota, Oregon, Utah, Vermont, Wisconsin and Wyoming.

So which America are we talking about? The District, or the 14 states that placed second in the world? The moral is clear: Average scores mislead completely in a country as heterogeneous as ours. We have many excellent public schools, and many that are not nearly as good. Those who want to undermine our public schools often condemn the whole system rather than face the inequities within it. They should focus their attention instead on rescuing the underfunded and ill-equipped schools that are failing children in our poorest neighborhoods.

Do we know where we have failing schools? You bet we do! The TIMSS-R tells us just what is happening. In science, for the items common to both the TIMSS and the TIMSS-R, the scores of white students in the United States were exceeded by only three other nations. But black American school children were beaten by every single nation, and Hispanic kids were beaten by all but two nations. A similar pattern was true of mathematics scores.

So, are American schools failing or is America failing to educate some of its

children? It seems obvious that what needs to be addressed is the wide variation in the achievements of U.S. schools, districts and states. Public educational systems are denying quality education to some American citizens, and these are usually poor children, often minorities. Public schools still succeed amazingly well for children in neighborhoods where livable wages are earned, decent housing and health care are available, and crime and drug abuse are not everyday problems.

When the TIMSS-R data for science were released last month, the news media and public school critics missed something important. The highest-achieving nation in the world exceeds the United States - even when we're looking at the average score across the nation - by getting exactly four more items out of 48 right. This is not the kind of huge difference between nations that will make the sky fall on America!

In mathematics, we did not do as well: Students from Singapore, the leading nation, got an average of 40 of the 48 items right. Even though they scored above average, American students got only 30 items correct. But at least one reason for that is evident from the TIMSS-R report. In the United States, only 41 percent of math teachers hold math degrees. The average among other countries is 71 percent. Perhaps, instead of condemning public education on the basis of these average scores, unhappy citizens should advocate paying teachers enough money so we can attract mathematicians and scientists to public school classrooms.

It is unfortunate but true that the chances of getting a fully certified teacher in a given subject matter varies according to where you live. One large suburban district near me, in Phoenix, hires no teachers without full certification. But in Arizona's inner cities and rural areas, well over half of math and science teachers do not hold either a major or a minor in math or science, and large percentages of the teachers hold emergency certificates, which means they are not fully trained and receive temporary certification only in response to a shortage in teachers.

The true message of the TIMSS-R and other international assessments is that the United States will not improve in international standings until our terrible inequalities are fixed. The schools that serve our poorest children are not working well, but less criticism of those schools and more help for the neighborhoods and families they serve are in order. And without the financing to recruit and retain qualified teachers for all America's children, the most wonderful curriculums, designed to meet the highest standards, will fail. The new president's testing and accountability programs won't change these realities at all.

David Berliner is the Regents' Professor and dean of Arizona State University's college of education.
From the Washington Post [Online], Sunday, January 28, 2001, Page B3. See http://www.washingtonpost.com/wp-dyn/articles/A54446-2001Jan27.html

ICMI Comparative Study: Mathematics education in different cultural traditions, A comparative study of East Asia and the West

International Commission on Mathematical Instruction

EDUCATION in any social environment is influenced in many ways by the traditions of these environments. As a consequence the results of such education will naturally differ with different traditions in different environments. Indeed, this is necessary since one of the intentions of education is to support the traditional continuity of structure and function of a special environment.

On the other hand, today we are observing a growing interdependence between environments like regions, states, countries, and different cultural areas of the world. In many respects they have to rely on corresponding or equivalent standards of education, and differences can cause irritations.

In mathematics education also, taking an international and intercultural point of view, we face this split phenomenon of difference and correspondence, linked with the perpetual challenge to improve the quality of mathematics education. A study attempting a comparison between mathematics education in different traditions will be helpful to understand this phenomenon in detail and to exploit it for the sake of mathematics education. From this, paths will be discovered leading to adequate and effective applications of differences, as well as correspondences, in national and international environments.

Due to the size of an ICMI Study, in manpower and in time, this enterprise must be limited to only a selection of cultural traditions. Those based in East Asia and the West seem particularly promising for a comparison, since similar interests in differences and correspondences have existed for a long time and experiences in equivalent research have been gathered.

A rich variety of aspects of mathematics education is to be considered in this comparative study, ranging from the host of social, economic and other contexts, curricula, teachers, students, goals, contents, methodology, media etc. to the nature of mathematics and the future of mathematics as well as mathematics education. Traditions of teaching and learning that are deeply embedded in history and culture will have to be compared, with a consideration of the rich experience growing out of them as well as their resistance to change.

At the same time, this comparative study must consider present developments in society, science and technology as well as ethics. Changing attitudes between generations are influencing the teacher-student relationship, as are the new information and communication technologies. In addition, these technologies define new roles for both the teachers and learners and the reaction is different in different traditions.

What kind of subjects will there be in schools of the future and how much planning is going on? In what ways will mathematics education of the future be comparable to that of today and how will it differ? What forces are competing in this field?

Exchanges of experiences and expectations will be an important part of the

study and critical considerations will be inevitable.

Previous ICMI studies normally proceeded in three steps: Discussion Document, Study Seminar and Study Volume. In our case we will insert an Electronic Discussion Forum before and possibly even after the seminar.

First, the IPC offers a Discussion Document to the mathematics education community and people from interested contexts. We will welcome applications for a study seminar by invitation which we expect to take place in Hong Kong in October 2002. Contributions can come from individuals as well as jointly from colleagues who are already engaged in comparative activities about different traditions in mathematics education. This will allow an operationalising of the study by referring to case studies, for example.

Second, the Electronic Discussion Forum will allow statements about the theme of the study in general and corresponding comments and questions from any colleagues interested in the study.
Among other intentions the Forum should especially enable colleagues interested in the same or similar field of comparison to meet and to cooperate in preparing a contribution in general or a case study in particular.

Third, the Study Seminar will consist of presentations identifying and interpreting consequences from different traditions to a variety of aspects of mathematics education. Moreover, a great deal of work has to go into the comparing of observations and findings, for example in focus groups. In this way the seminar will arrive at recommendations for the applications mentioned above, serving to make differences and correspondences fruitful for national and international education.

Fourth, a Study Volume will be published for the mathematics education community and the interested public, containing the results from the communications and comparisons at the seminar

Contributions to the study
1. Call for contributions

The ICMI Study *Mathematics education in different cultural traditions: A comparative study of East Asia and the West* consists of

- an *Electronic Discussion Forum*,
- an invited *Study Conference*, and
- a *Publication* to appear in the ICMI Study series.

A discussion web-site is being set up, and members of the mathematics education community are invited to participate in discussion on the major topics and problems identified in this discussion document or related issues. Please refer to the official web-site at the end of this document.

The invited Study Conference, with a size of about 80 to 100 participants and a duration of 5 days, is scheduled for October 2002, in Hong Kong.

The IPC, as well as ICMI, is interested to have approximately equal number of participants from East Asia and the West, like the composition of the IPC. English, however, will be the language of the conference. We are well aware that this may mean a handicap for many individuals whose first language is not English, but we would nevertheless like to encourage such people to participate. We would also like to encourage the native English speakers to take special care of this situation. We will have little chance to succeed in a real comparative study if we do not succeed in managing the language problem in the Study Conference.

It is expected that every participant be active in discussion and other modes of activity during the conference.

Participants should finance their own attendance at the conference, and invitation to attend the conference does not imply that financial support will be provided by the organisers.

Individuals and groups are invited to send in abstracts of their anticipated contributions on specific questions, problems or issues raised in this document to **both** co-chairs as soon as possible.

The major outcomes of the Study, based on the contributions to, and the outcomes of the Conference, as well as results from the electronic discussion, will be published as part of the ICMI Study series by the end of 2003, and will be presented at ICME-10 in 2004.

2. Time-line

From March 2001
Individuals and groups start sending in to both co-chairs abstracts of their anticipated contributions in reaction to this Discussion Document
From May 2001
Contributors invited to produce longer versions of their submission for the consideration of the IPC
30 September 2001
Deadline for submission of longer versions of contributions
October 2001
IPC meeting
November 2001
Invitations to attend the Study Conference sent to selected individuals
15 June 2002
Camera ready papers for the conference to be submitted to the co-chairs
August 2002
Publication of pre-conference proceedings
October 2002
Study Conference in Hong Kong
December 2003
Publication of Study volume
July 2004
Presentation of Study results at ICME-10.

3. Contacts

Enquiries on all aspects of the Study, as well as suggestions concerning the content of the study conference programme should be sent to **both** co-chairs:

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- The official web-site for the Study is: http://www.inf.fu-berlin.de/icmics