STATEMENTS OF WILLIARD MC GUIRE, PRESIDENT, NATIONAL EDUCATION ASSOCIATION; ALBERT SHANKER, PRESIDENT, AMERICAN FEDERATION OF TEACHERS; AND PATRICIA ALBJERG GRAHAM, DEAN, GRADUATE SCHOOL OF EDUCATION, HARVARD UNIVERSITY, CAMBRIDGE, MASSACHUSETTS, ON BEHALF OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION

Mr. McGuire. Thank you, Chairman Stafford and Senator Kennedy. I am Williard McGuire, President of the 1.7 million member National Education Association, which represents teachers, higher education faculty, and educational support personnel in all of the 50 states.

As a representative of nearly four-fifths of the nation's public school teachers, and as a classroom teacher of math and Spanish, I appreciate and welcome this opportunity to comment on the legislation before this committee that is designed to improve instruction in math and science for our natin's young.

We commend the chairman for holding these hearings on providing assistance from the federal level to local schools and higher education institutions to develop an immediate response to science and math needs.

The problems and deficiencies in the area of math, science, and new technologies are growing to crisis proportion, and we owe it to our young people to respond now.

Today we stand at the crossroads. Public investment in education is being questioned at a time when studies have documented that scientific and technical learning, as well as communication in foreign language study in the United States have failed ot keep pace with the phenomenal advances of the past two decades.

In fact, learning in these two areas has actually declined, and increasingly American youth across the land are not adequately prepared to take on the economic, technological, and national security challenges facing the nation. In addition, there is a growing shortage of math and science teachers with chronic vacancies occurring in some areas.

Our concerns in this area are further documented in the appendix to this statement.

[Material referred to follows:].

Mr. McGuire. How should Congress deal with these problems? Three alternatives suggest the range of possibilities. First, the administration proposes taking $50 million out of Chapter II bloc grant funds to establish a scholarship program for individuals who within a year's time could be qualified to teach math or science at the secondary level. This quick fix approach merely puts a bandaid on the problem and ignores the need for better science and math instruction at the elementary level. And it provides no tools for planning and implementing a comprehensive program that will make all of education responsive to the total problem.

Second, the committee is considering S. 530, a far better approach that takes into account such additional areas as foreign language instruction, improved vocational education offerings, teacher training, and employment based programs. And this bill authorizes $400 million a year for three years.

And third, there is the American Defense Education Act, ADEA, which is the most comprehensive program to address the two top priorities of the nation today: economic recovery and national security.

ADEA provides incentives for local schools to improve the quality of education, especially in math and science, but also in foreign languages, communications skills, new technology, and to prepare students for employment, technical training, and for higher education.

How do teachers rate these bills? Mr. Chairman, the NEA has developed criteria attached to the appendix to my statement which provide an important evaluative framework for consideration of any math and science proposal coming before Congress. In this context, I would like to return to S. 530.

NEA criteria recommends that 95 percent of the funds be directed to the local education agency level. It is at the local level that the nation's educational policy is administered and operated. And it is here that the need exists.

It is more cost effective to send funds directly to the local level than to challenge them through a state bureaucracy. The 50 percent matching requirement in S. 530 would be a serious problem for the states which are experiencing extraordinary demands on their resources merely to provide the most basic services.

We believe strongly that a national problem of the dimensions we have outlined demands an adequate allocation of national resources. In the funding of S. 530 and of the House passed bill, H. R. 1310 is adequate for planning an initial program step, but not for a long range, comprehensive solution like the American Defense Education Act.

We understand and agree with the need for emergency programs, but believe the depth and the scope of the issues before

Congress today will require a long term commitment of massive resources beginning at the federal level. NEA criteria call for administration of new legislation by the Department of Education which would coordinate programs in support of local efforts and initiatives.

Our criteria also specify that teachers working in close association with local school boards, business and labor leaders, and others interested in education develop and implement the best tailor made, effective programs. We applaud the inclusion of a strong higher education component in S. 530, but recommend that the teacher training program in colleges and universities require joint consultation with local education agencies and teachers in the planning and implementation of the programs developed.

Several math-science bills now before Congress compose differential pay for teachers in these areas. NEA strongly opposes this approach as one that conveys a strong message to all teachers: that some subject areas are more important than others. After all, without reading and writing skills, not child can learn science and math. And this means, too, that education at the elementary school level must be taken into account in any initiative for improving math and science instruction.

We believe the answer is ADEA. And NEA members support the philosophy of the American Defense Education Act because

it is a national program to meet the urgent national needs of improving instruction in math and science, communication skills, foreign language, guidance and counseling, in addition to reaffirming quality of access to education for all, as the concepts upon which the federal role in education has been built since the early years of the nation.

ADEA establishes participation requirements for local school districts which choose voluntary participation in the program, and these include an assessment of both instruction and achievement in the elementary and secondary schools in the critical subjects, development of overall goals to p-epare students for employment, technical training, higher education, citizenship, includingservice in the nation's defense.

And to measure the progress of the programs with ADEA assistance, local school districts will establish yearly evaluation systems developed with participation of the school board, administrators, teachers, parents, appropriate abagaining agents, business and industry, and the community at large.

During each fiscal year, school districts working with the ADEA program will be entitled to a basic payment of 2 percent of the average per pupil expenditure in the state. And those which can show substantial evidence that the program meets ADEA goals for the year will receive an additional 2

percent payment.

The summary and chart following the statement outline the basic program elements and estimated allocations to states during the first year of operation.

Mr. Chairman, at this time we urge that the assessment and needs analysis be commenced first. Further hearings and input can only assist in planning and implementation of an effective comprehensive program. NEA state affiliates are working with governors in support of ADEA, and they would welcome the opportunity to offer their insights and recommendations to the committee.

We look forward to working further with the committee in the interest of developing a comprehensive, well financed program to attain the goal of better education to meet the challenges of this rapidly changing world.

Thank you.

Senator Stafford. Thank you very much, Mr. McGuire. Mr. Shanker, would you go next, or should Dr. Graham go next?

Mr. Shanker. Fine. Thank you very much. Mr. Chairman and members of the committee, I am Albert Shanker, President of the American Federation of Teachers. We represent and hae membership of just under 600,000 across the country, mainly in elementary, secondary, and higher education, but also in health care and Civil Service professipnals.

We welcome the current interest in some of the major

problems in the field of education, especially with the current emphasis and interest on the shortage of teachers in the fields of mathematics and science. But we think that just as these shortages were easily predictable some years ago when the number of people entering into teacher training in general and specifically in these fields was--has been known for quite a number of years; we tend not to look at them until it is quite late, and it is quite late now.

I would urge that along with the attention that we are now giving to mathematics and science, that we start giving attention now to the fact that in just a few years from now we will be sitting in this room or one like it discussing overall shortages in almost every area of teaching.

Furthermore, the problems that we have in providing mathematics and science teachers cannot really be separated from the quality of education in general. The national assessment recently has given us some very interesting and important evaluations showing that when it comes to adding or subtracting, multiplying, dividing, when it comes to very basic, fundamental operations, we have done pretty well over the years andthe overwhelming majority of students who go throughour schools do pretty well.

The minute you move over to something that is a verbal problem that takes more than one step, even if the numbers are really very easy and if the numbers are precisely the same

numbers that they would be able to do if all they had to do was add or subtract, you fall down from an 85 or a 90 percent level of competence on the simple calculation down to a 20 or 30 percent level in the ability to be able to think something through, even if it is pretty simple.

I would submit that that thought process involves many verbal skills, and it involves skills that are not taught in math and science alone, and therefore we should be thinking of something that is somewhat broader. Now, in dealing with this problem, unfortunately what we are trying to do what we frequently try to do and that is try and get a very quick fix for something that has been neglected over a long period of time and will only be solved, if it is solved at all, over a long period of time.

And I would like to spend just my remaining few minutes talking about some of the things that we ought to be doing, both in the long run and in the short run as well. Because in the absence of being able to solve the problem instantly, a quick fix, even if inadequate, is better than nothing at all.

I would like to spend a good part of my time on an area of this problem which I think has been largely neglected in the entire discussion, and that is the good deal of discussion deals with what we are doing in teacher training institutions. That is fine; or what we are doing in terms of colleges and

universities, provding enough people. That is all right. And then there is quite a bit of it at the high school level. What are we doing with algebra or geometry or trigonometry or other courses.

I think that dwelling at those levels will not produce any satisfactory results unless we take a look at what is happening in our elementary schools. Now, we allow students to leave elementary school and go to secondary school, even if they have totally failed in understanding and achieving in the whole area of mathematics and science.

They move right on. And then you can go through high school and you can graduate high school, again, without developing any competencies in these areas. And you can certainly enter college and graduate college and become a teacher.

Now, maybe there is no terrible loss if someone ends up becoming an English teacher or social studies teacher, although I am sure if they knew some math and science, it would be helpful. But--and we assume that math teachers who have gone into that field have some interest and some competence in it. Although I would feel better about it if we tested them before they entered.

But what I am very sure of is that a very large number of elementary school teachers are those who went to elementary school and high school and college and really never understood

arithmetic. Let us forget about any mathematics above that. And since our elementary schools are organized on a self--contained classroom basis, it is quite possible that the children of America have a teacher once every other year or once every third year who himself or herself really does not understand simple arithmetic.

Now, unless we concentrate on that, we are producing elementary school graduates who move into secondary school who have only had half of the mathematics and arithmetic that they are supposed to ahve had throughout their elementary school.

And what we are doing is we are--we have already lost the battle because we already have students then who are three or perhaps four years behind. I would very strongly suggest, therefore, that as the short term priority--at least one short term priority be the provision of summer and other training institutes for those who are now teaching in elementary schools and who feel that they could use some additional assistance to improve their teaching.

And I am sure I will have an opportunity during the question period to raise some of the other points which I make in my paper.

Thank you very much.

[Material referred to follows].

Senator Stafford. Thank you very much, Mr. Shanker. And now it is the committee's privilege to hear Dr. Graham.

Ms. Graham. Thank you very much, Mr. Chairman. I am Patricia Albjerg Graham, Dean of the Graduate School of Education at Harvard University, and a member of the National Science Board on Precollegiate Education in Mathematics, Science, and TEchnology.

I want to thank you for the opportunity to appear today on behalf of the American Educational Research Association. I am presenting AERA's views on the legislation before this committee and the critical need for educational research authorities to be included in any new legislation designed to improve instruction in mathematics, the sciences, and technology.

I want the committee to know thatwe at the American Educational Research Association join in the statement presented on behalf of the higher education community, and I would like to submit that for the record.

[Material referred follows:].

Ms. Graham. In the moments that remain to me, I would like to congratulate members of this committee on recognizing a vital problem in our midst, namely the fact that children, particularly upper elementary and high school students, lack mastery of mathematics and science and technology, as well as computers.

But I think we need to recognize that this is the tip of an iceberg. The children's inadequacy in this area represents the tip of an iceberg. And like an iceberg, that which is visible is frightening and cause for alarm. But also like an iceberg, that which is below the surface and not currently seen has even more potentially devastating consequences.

The fundamental issue, I think, that we face as a society is the need for our society to improve and to be productive, is for all American youth to master the complex skills, not just the basics, on which we have some evidence that youngsters are not doing so badly, but the complex skills, which has to do with reading comprehensiveness, being able to read a paragraph and understand when you have read it, what you can infer from having read it; being able to write systematically; being able to think clearly; being able to develop a perspective on our past and on our present social and economic circumstances; having some acquaintance with foreign languages.

These are just as important as mathematics, science, technology, and computers. But, like the rest of the iceberg, they are generally hidden from view. Why is this a problem? It seems to me, first of all, that the basic skills which are associated with the primary grades are in reasonably good shape. The evidence from the National Assessment of Educational Progress, which is currently granted out of the National Institute of Education, shows that gains for nine year olds across the board--nine year old children across the board have been pretty good; 13 they look less good. At 17 they look much less good. But the nine year olds are looking not so badly.

The question is: why is this? And although we can speculate as to what all the causes are, there are three elements which I think we have to admit have played a significant role in that. The first of those is Title I of the old Education Act of 1965; secondly is the Head Start Program; and third is the research which underlay instruction for preschool children and for elementary school children on which the National Institute of Education, the Office of Education, the National Science Foundation--substantial funds were expended.

These federal efforts since the mid-1960's have concentrated both programmatic funds and research funds at the primary and elementary levels, and there substantial

progress is now evident.

At the upper elementary, at the high school levels, achievement is a very different matter. We have substantial evidence, which I am sure that all of us here can cite and that is familiar to all of you, substantial evidence of inadequate academic performance.

Also at the upper elementary, and particularly at the high school level, there has been practically none of the old Title I money spent, although it was authorized, but it was never fully funded.

Until the late 1970's--until 1977-'78, the National Institute of Education focused research at the elementary level, not at the high school level. In recent years it has been focusing, when it had money to focus, on the high school level.

The problems at the high school levels are very serious. And they seem to me to include restoring academic and cognitive learning to a position of prominence for all American children; helping teachers to be much more effective in teaching in these areas; understanding the ways in which children learn and the ways in which teachers teach effectively; and that these are issues for research. Therefore, I would say that as we look about ways to think about solving these problems, first is to support school leaders, whoever those school leaders may be, whether they

be principals, whether they be teachers, whether they be coalitions of community leaders, to address the learning issues in the school.

Secondly, to look to issues of teacher quality: to improve teacher quality through summer institutes, through programs at the school, through programs outside.

And third: to support research aimed at understanding and improving the teaching of the complex skills: cognitive research; pedagogical effectiveness; curriculum studies.

Finally, in conclusion, let me say that I have two caveats that I would like to raise about the math-science initiative. Justice was referred to earlier. I would like to refer to it again. Traditionally, in this society the people who have done well in mathematics and science are that minority of the population who are white and male.

I recognize the importance of that segment of the population, but I recognize also the importance of the rest of the population; that if we concentrate our math-science efforts, we must include all the population, not just a portion of it.

Secondly, as we look to take into account seriously computers and making the new technologies available to children, we need to make sure that all children have access to those new technologies and that those children who have the new technologies at home not be given a superior

advantage over those children whose families cannot have the new technologies at home and thereby further widen the gap between the children of the rich and the children of the poor.

Our society cannot afford to have that gap exist, and all children must achieve satisfactorily in school levels. Thank you very much.

Senator Stafford. Thank you very much, Dr. Graham.

One of the principal issues facing us in the area of mathematics and science education is that of teacher retention. We have heard of low salaries relative to industry, poor teaching environments, dilapidated teaching facilities and equipment as some of the key factors in teacher dropout.

How do we realistically in the short term face the problem of teacher retention, particularly in the area of math and science? What is the federal government's role in this regard?

I raised this with the Secretary, but I would like to raise it again for brief comments from this panel.

Mr. McGuire. I would be happy to respond to that. It certainly is a difficult problem, and at the base of it, of course, the financial matters are of great importance. Teachers' salaries have lagged substantially and we are going to have to deal very carefully with that. And any influx of

money that will help in the salary area will be of some help, but will not be sufficient to turn it around completely. We also talk about the feeling of rejection, the feelings around the workplace, and I believe that the American Defense Education Act addresses this at least in one regard: the involvement of the teachers, of the administration, of business and labor, the community at large, will be at least one step in the direction of moving teaching back into the area of strong community support and a high level of appreciation which once we were there, but now have diminished and has had quite a telling effect.

So my testimony, I think, addressed at least the finances in terms of substantial resources being put in the district and the involvement of the community in the building of that support which I think are critical.

Senator Stafford. Thank you very much.

Dr. Graham?

Ms. Graham. I would simply like to observe that while I agree that it is always better to improve teachers' salaries, as Mr. McGuire suggests, that in two recent studies by the NEA in terms of what teachers considered the most important issues facing them and the greatest difficulties, the first three all had to do with conditions of work and lack of public respect for the efforts that teachers were making to instruct the young.

And, therefore, I think those issues are vital to be addressed, and I think particularly the kinds of summer institutes that used to be associated with the National Science Foundation and associated with the National Endowment for the Humanities are pariticularly helpful in preserving teachers' sense of viability and confidence in their work.

Senator Stafford. Thank you.

Mr. Shanker?

Mr. Shanker. Yes. I think that certainly in attracting new teachers the salary question is a top question because if you are going to--my experience has been that college graduates, not necessarily at the top of their class or in math or science, may take five or six months now to find a job, but when they do find one, there are training positions open where you start at $18,000 a year.

If you have had some experience with computers and have a background in math and science, 21,000 or 22,000 is not considered a windfall type of job. It is a normal entry salary.

And when you think of beginning teacher salaries, 10,000, 11,000, 13,000, even if you were to add a bonus, which I too do not seeing very much because I do not hear anybody talking about bonuses of $10,000 or 15,000. I do not hear them talking about something which would equal or compete with

what industry is doing. They are talking about 1000 or 2000 which is great public relations to show that you are making an effort, but the new entrant is still going to look at the 13,000 in a school system as against 23,000 in industry. Now, as far as teachers in, the retention question, I would agree with Dr. Graham that the most important issue there really are the working conditions, whether the teacher feels that he or she is accomplishing some type of life mission.

Now, some of that has to do with conditions that we talked about. Let me mention one that has not been talked about.

Our schools no longer require students to take very much math or science. Now, if you are amath or a science teacher and if you are able, you really did not enter teaching to teach remedial arithmetic in high school to somebody who did not make it in third grade.

You may be willing to do that for one or two period a day, but in addition to that, for your--in terms of your own interests, just as the English teacher probably wants a course in which Shakespeare or something can be taught and not just some remedial work, that teacher would like a chance teaching some advanced courses.

There are not very many advanced courses if you do not require students to take courses. All you have then is some sort of a remedial or a beginning course, and that is the

beginning or end of it, and there is very little stimulation. A person interested in math or science says, look, I am wasting my time. It is nice that this kid is going to learn how to count his change when he leaves the store, but that is not why I went to school that many years.

Now, I think that one of the things that we have got to do is--and, by the way, this is a key to providing future math and science teachers--we have got to get away from the philosophy that the curriculum is made up of what children enjoy at the particular moment that they are in school or what they think is relevant, to use the phrase that has been determining our curriculum in recent years, and to reassert the notion that sometimes adults know what children need a little more than the children themselves know, and that at some later point they will find out that what we compelled them to do was right for them.

They right even enjoy it later on. But I think that one of the key features in retaining teachers is to give them a program that they enjoy teaching. And they will only get that program and we will only get our future supply of math teachers if we decide that we are going back to a period where there are requirements of an extensive period of education in these areas.

Senator Stafford. Thank you very much, Mr. Shanker. I think I have consumer five minutes. So, Senator Kennedy, I

will yield to you.

Senator Kennedy. I would like to hear from the panel: we have a number of proposals that are before this committee at this time on the subject matter. Each of you have covered different phases of the legislation.

But if you were to try and put the three or four top priorities in addressing this subject matter in the legislation, what might they be?

Do you want to start off?

Mr. Shanker. Sure. I would state three of them: first would be retraining because that is the best way to get some quick results, even though they are not the long term results we want, and retaining is under two categories. First, we have got to do something in terms of addressing the current deficits in these areas in the elementary schools; creating summer institutes and facilities where elementary school teachers who feel that they themselves are not able to do an adequate job in these areas are able to get the retraining or training or help that they need so that they can start doing an effective job with their own students.

Second: half of that retraining, probably the biggest group of math teachers we could get right away is to turn to teachers who are now teaching other subjects in secondary schools or perhaps some in elementary schools, people who majored in English or social studies or other fields, but had

a minor in college in mathematics or in science, and maybe they are not too many credits away, and to say, look, we have the tuition money for you. We have a stipend over the summer so you do not have to coach or take some job over the summer.

The largest number of teachers we are likely to get in math and science in the short run are people who are already teaching other subjects and who are encouraged to move over. So, retraining is the first.

Second is recruiting, and there I think the targeting in terms of loans and scholarships for students who are willing to commit themselves to go into this is the best bet in terms of a short term bet.

And the third has to do with the emphasis on requirements because that is the long term. If we do not go to a situation where all of our high school students nationally are taking a full program throughout their school career of mathematics and science, if we are allowing children to decide in advance, this is too difficult for me; there is too much homework in it; it is easier to take some soft elective, and so I am not going to take this; what we are doing is we are now, by not enforcing curriculum standards in high schools, automatically creating a shortage which no number of incentives will undo.

Nobody is going to start on a career in mathematics and

science in college if they have not gotten the foundation before that.

Mr. McGuire. I think we need as a basis either ADEA or something very similar to that that is broad and comprehensive, that works with the planning and the implementation and the evaluation of what is actually going on within the school district, from elementary school throughhigh school.

Additionally, the in service training, the institute program or other things within the district, I can speak very directly to that because when NDEA was passed about 25 years ago, I am a product of two of those institutes: one in foreign language under NDEA and the other sponsored by the National Science Foundation through NDEA in mathematics. And I found those, after teaching about 10 years prior to that, to be extremely helpful in the classroom. And we need to of course also address the preservice training to have that be effective and also be in a setting in which it will help attract our college graduates and teacher education into these areas.

Ms. Graham. I would have a slighly different set of priorities. First I would argue that, in talking about federal legislation, the federal government has a responsibility for educational research that it does not have for the administration of educational programs. And, therefore, I would encourage any legislation to include serious amounts

of money for research on learning, children's learning styles, on pedagogical effectiveness, on school organization, and on curriculum.

Secondly, I would agree with my colleagues that a high priority should be placed on various kinds of in service training for teachers who are presently responsible for instruction in mathematics or science, either at the high school level or those who have responsibility at the elementary level as well.

I think the people who are presently there who are teaching are likely to be there for a long time, and it is imperative that those people be knowledgeable about mathematics and science and furthermore than they feel comfortable in teaching it. I fear that that is not universally the case.

Finally, I would talk about the need for support to get people to enter mathematics and science teaching at the elementary and the high school level. I am not, from my perspective, enormously optimistic about being able to get 21 year old persons who are well trained in mathematics or science to commit themselves to a lifetime of teaching mathematics or science at the elementary or secondary level.

I hope that there will continue to be such gifted people in mathematics and science who will do that. On the other hand, I think realistically we need to start looking at some other possible pools of mathematics and science

teachers, particularly people who already know about mathematics and science, but who for one reason or another may feel at the age of 50--and their company may feel with them that their service in the company is no longer as valuable as it once was, and through early pension arrangements may be--some may be attracted to a one year program in which they might be prepared to become mathematics and science teachers, with the pension as a supplement to the salary which they would ordinarily be getting as beginning teachers at the master's level.

I think some innovative approaches of that sort bear investigation.

Senator Kennedy. Mr. Chairman, my time is up. Could I ask just one additional and then maybe submit the other questions?

And that would be---

Senator Stafford. Sure.

Senator Kennedy. Just on the--all of you have commented on the concern that you have about the elitism which might develop from a focused program for math and science being available at a precollege level. Do you all believe--or do you believe that it ought to be something which is--the focus of this legislation ought to be at the elementary and secondary level as well as in the precollege period?

Mr. Shanker. Yes, I certainly do. And I do not think

we are going to solve the shortage problem given the demographics of this next period,that we have a decline of, oh, 20 to 22 percent in the cohorts entering both the work-force and the colleges and universities, 16 to 25 year olds. If we do not reach out to groups that have not previously made it in these fields, we are not going to make it because we are just dealing with a much smaller population.

And if we do not reach minorities and women who have not previously gone into math and science in any decent proportion, if we do not reach out and recruit from these groups, then we are engaged in a hopeless enterprise because of the demographics.

Ms. Graham. I believe the talent is widely distributed in tnis society, and society needs to nurture all the talent it can find. And I think talent exists throughout and we need to look at all of it.

Mr. McGuire. I would agree with the two other speakers.

Senator Kennedy. I thank the panel for their testimony; if I could just submit a few other questions.

Thank you.

Senator Stafford. Thank you, Senator Kennedy. The chair, for the members of the subcommittee, would reserve the right to all members to submit questions in writing, if that is agreeable to th e panel, for response at your early convenience.

Senator Pell, do you have any questions?

Senator Pell. I have a couple of questions and look forward to perusing the testimony. I understand it is excellent. But I was interested in the reaction of the panel as to whether they believe that language instruction should be included as a high priority in the legislation we are considering.

And there are two kinds of language instruction I am thinking of. One is foreign language, and the other is the point that Senator Denton brought up, whether English should be included in this bill.

What would be the reaction, just going from left to right? Mr. McGuire?

Mr. McGuire. Thank you, Senator. I mentioned both of those and feel very strongly that they are important. We have talked about the needs at the elementary school to have a strong base in English, in reading and writing in order to be able to move ahead and do well.

Senator Pell. Excuse me. My question is: should they be included in this bill?

Mr. McGuire. Yes, I believe they should be included in the bill.

Senator Pell. Both?

Mr. McGuire. Yes, both. And in terms of the American Defense Education Act, we are talking in terms of both.

Senator Pell. Right. Because this would mean less money in math and science.

Mr. McGuire. It might, but in terms of the American Defense Education Act, we are talking about a community response to the improvement of math and science instruction and of foreign languages. We are talking about a community based, comprehensive plan that will be implemented from elementary grades through high school in ways that the community determines best what will help the math instruction, the science instruction, and the foreign language instruction, and I believe that is going to take a strong English component as well, in reading and writing at the elementary school level in order to provide the base where those things can happen.

Senator Pell. Thank you.

Dr. Graham, do you think both should be in the bill?

Ms. Graham. Absolutely.

Senator Pell. Or should we just focus the approach on math and science as we do now?

Mr. McGuire. I think it has to be broader than just math and science.

Ms. Graham. My sense, Senator, is that the United States Senate is responsible for improving the entire nation, and the entire nation needs improvement in its ability to use language as well as its ability to deal with mathematic

and scientific and technical matters. Yes.

Senator Pell. Would you include both, foreign language instruction and English language instruction?

Ms. Graham. Yes.

Senator Pell. Thank you.

Mr. Shanker, what would be your view?

Mr. Shanker. It think it is a question of tactics and not a question of goals. I think there is no one here who is opposed to improvements in instruction and solving problems that we have in all these areas. But we also know that from time to time the people of this country focus on a particular issue, sometimes separating it from other important issues.

I think this is such a moment. And while I would strongly favor legislation which would generally increase education, which would increase it in categories which we have had in the past, which would focus on foreign languages--and there have been such proposals and we have supported them in the past--I think that focusing on math and science in this case is likely to produce a better program, and it is likely to produce more funds, and I think that from a tactical point of view, we are probably better off at this point not abandoing these areas, but saying that this is our mission today, and then we will go on to these other missions in the very near future.

Senator Pell. Thank you.

One other question, if you will permit me, Mr. Chairman, and that is I was reading a rather dismal article in U. S. News and World Report last night about teaching. What can be done, in your view, to improve the quality of teaching? Should there be tests for teachers, or should it increase the national incentives as we are doing, but what can be done to enhance the quality of the teaching?

Mr. Shanker. Well, certainly, one of the things that ought to be done is that there ought to be a test for those who enter. The test will not guarantee that you--that anyone who passes those tests and even anyone who passes them with high marks, they will not necessarily make great teachers. They may have great psychological problems. They may hate children.

They may be unfit for many reasons. But I do not care how fit a person is on the basis of motivation, on the basis of his own psychology, if a person is illiterate, that person should not be a teacher. If a person does not know any mathematics, they should not be a math teacher. And if they do not know enough math to be an elementary school teacher, they should not be an elementary school teacher.

Now, some states are starting to give these minimal competency tests to teachers, and you see that there are rates of failure on simple arithmetic questions as high as--ranging

from 10 percent to 70 percent failure rates.

And I would guess that if you get a failure rate of, let us say, 30 percent in a state that is giving an examination, probably the applicants know they cannot pass it; many of them have not even bothered to apply. I would say states that do not give an examination may very well be hiring from a pool where the percentages are even higher.

That is an absolute minimum that we ought to do.

Senator Pell. And do you think such competency checkups, the tests should be given every 10 years or five years, or one test?

Mr. Shanker. Well, I doubt very much that somebody who knew his arithmetic or her arithmetic 10 years ago and has been teaching it for 10 years has forgotten it after 10. I also do not think that it is a very good recruiting device to tell new people, come on in, we are hiring you for five or 10 years, and every once in awhile we are going to check you out and you can be bounced at any time.

We do not do that in any other field. Maybe we should.

Senator Pell. Maybe we should in the Senate.

[Laughter.]

Senator Stafford. In the Senate we do it; we have a thing called elections.

Senator Pell. As the chairman points out, we do. In connection with the--well, first let us get the answer from

Dr. Graham, what her reaction is.

Ms. Graham. My sense is that for teaching, what you start with is a knowledge of the subject matter that is to be taught, and the knowledge of the subject matter that is to be taught is a necessary but not sufficient condition for good teaching.

The additional issues have to do with pedagogical style, pedagogical skill, perspective on the educational enterprise, and concern for the welfare of children and their learning. But unless teachers are thoroughly competent in what it is that they are to teach, and unless they have enthusiasm for it, children will not learn.

Senator Pell. So, in other words, you approve of the idea that one of the tools in hiring would be passing a test. As you point out, it does not necessarily make you a great teacher.

Ms. Graham. I think there are a variety of ways to assess whether or not a teacher is competent in the subject matter. Testing is one of them. Performance in academic courses of rigorous merit is another. There are a variety of ways. To my mind, no single method has been devised that is satisfactory.

Senator Pell. Of course, if you tested one in math, we went through this phase of new math, and now, as I understand it--I never could understand new math--and now we

have gone back to the old math. So that would make it very difficult to do.

Ms. Graham. It is a revised math; no question about that.

Mr. McGuire. Certainly, we believe that two things have to happen. One has to be in the whole area of teacher preparation and we favor a very strong teacher preparation program with high entrance requirements, a rigorous course study in the discipline to be taught, and work in education, working directly with young people, and rather than any single test, that a profile be kept including the entrance test scores, the grade point average within the rigorous following of the discipline, and then evaluation of that sensitive interraction that takes place between teacher and student that has been videotapes and observed.

And through that entire profile, we should have a better idea of finding those who have a high promise of success in that respect.

Senator Pell. You would not objectto a test being one of the criteria?

Mr. McGuire. There would be many--a single--I would object to a single test of the person doing all that was expected of them during the four years and taking a single pencil and paper test at the end. But I believe there should be strong entrance requirements, many tests given during the

rigorous course work, and evaluation all the way along so there was a profile to look at, rather than a single test at the end that said, you are in; you are out. I do not think that that is nearly as fair as a strong profile over the entire period.

Mr. Shanker. Senator, I would strongly disagree with that. I think that your grades in college are an indication of something. Sometimes they are an indication that the college gives easy grades. They are not an indication, very much--I do not know how we monitor whether a person has been in rigorous or tough courses and done well without some very extensive system, which I do not think this country wants to get into or ever will get into.

I do not see what is wrong--if prospective lawyers can take bar exams and doctors after going to medical school take examinations; actuaries take examinations. Everybody in our society takes examinations, not because we do not trust somebody, but because we do not have a system that absolutely will guarantee that the institutions are making proper certifications.

Now, if everyone else in our society can take a tert and that test plays not the only role, but a very important role in determining whether that person moves into an occupation or a profession, I do not see why we cannot provide the same protection for our children that we provide for

everybody else.

Senator Pell. I think you are right: from birth to death, the doctor has to do it and the undertaker has to do it. And you--I would agree with you.

I have no further questions.

Senator Stafford. Thank you very much, Senator Pell. And for the subcommittee, I want to express our appreciation to all three of you for being here. There will be some questions in writing, I can assure you, and we will look forward to your answers to those, as we have enjoyed your answers this morning here in person.

Thank you very much.

Mr. Shanker. Thank you.

Senator Stafford. The next panel will consist of Dr. E. K. Fretwell, Chancellor of North Carolina University at Charlotte; Dr. Howard D. Mehlinger, Dean, School of Education, University of Indiana at Bloomington, Indiana; the Reverend William J. Byron, President of Catholic University; Dr. Richard Brod, Director, Association of Departments of Foreign Languages, Modern Language Association; and, Dr. Joshua Smith, President, Borough of Manhattan Community College, New York, New York.

Welcome to all of you and our appreciation for your willingness to come here and assist this subcommittee in the job we have embarked upon on behalf of education. Again,

I apologize for the lack of time we always seem to run into here. And I guess I explained to the earlier panel that stop and go system we have been forced to resort to, it gives you four minutes on the green, a minute on the yellow, and then the red.

And since we have your statements in full, we will place them in the record as if read and encourage you to summarize them within the timeframe, if you possibly can. Having said that, it would be the chair's intent to go in the order in which we introduced the panel, if that is agreeable to members, which means Dr. Fretwell, you would proceed to be followed by Dr. Mehlinger, the Reverend Byron, Mr. Brod, and finally, Dr. Smith.

If that is agreeable, Dr. Fretwell, we will start with you.

STATEMENTS OF E. K. FRETWELL, JR., CHANCELLOR, UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE, ON BEHALF OF THE AMERICAN ASSOCIATION OF STATE COLLEGES AND UNIVERSITIES; HOWARD D. MEHLINGER, DEAN, SCHOOL OF EDUCATION, AND PROFESSOR OF EDUCATION AND HISTORY, INDIANA UNIVERSITY, BLOOMINGTON, INDIANA; REVEREND WILLIAM J. BYRON, PRESIDENT, CATHOLIC UNIVERSITY OF AMERICA; RICHARD BROD, DIRECTOR, FROEIGN LANGUAGE PROGRAMS, MODERN LANGUAGE ASSOCIATION, AND SECRETARY-TREASURER, JOINT NATIONAL COMMITTEE FOR LANGUAGES, WASHINGTON, D. C.; AND, JOSHUA SMITH, PRESIDENT, BOROUGH OF MANHATTAN COMMUNITY COLLEGE, NEW YORK, NEW YORK, ON BEHALF OF THE AMERICAN ASSOCIATION OF COMMUNITY AND JUNIOR COLLEGES, AND THE ASSOCIATION OF COMMUNITY COLLEGE TRUSTEES

Mr. Fretwell. Thank you, Senator. I am E. K. Fretwell, Chancellor of the University of North Carolina at Charlotte, and I am speaking today for those of us in North Carolina and also for 20 organizations listed on the cover of the testimony, which I am glad to present for the record.

[Material referred to follows:].