I am very honored to be recognized by this great university – a university created by the people and for the people of Singapore to build opportunity in this nation that is so eager for learning. Nanyang Technological University has, over the last 50 years, become a great global university, reaching out to the United States, Europe, and Asia, operating in the multicultural tradition that is one of the great strengths of the Singapore education system.

I am also greatly honored to be recognized by the National Institute of Education, a critically important part of this great university and this nation. Perhaps more than any country in the world Singapore represents a nation that sees its future in the knowledge and expertise of its people – and those of you graduating today are the key to that future. I have just finished writing a book about globalization and education in which I talk at length about Singapore’s strong amazing educational progress, driven by forward-looking leadership and supported by a creative and committed National Institute of Education.

Singapore has taken up the challenge of creating a 21st century education systems with as much enthusiasm and determination as anywhere in the world, creating what your former prime minister Goh Chok Tong called “Thinking Schools for a Learning Nation.” You are, as the Ministry of Education put it, rapidly developing

… a nation of thinking and committed citizens capable of meeting the challenges of the future, and an education system geared to the needs of the 21st century.
Schools are becoming learning organizations by constantly challenging assumptions, and seeking better ways of doing things through participation, creativity and innovation.

The eyes of the entire world have been on this process since Singapore students have demonstrated such high levels of excellence in the international assessments of mathematics and science over recent years. And NTU’s Institute of Education has supported these accomplishments by preparing expert teachers, helping them imagine and create the schools of the future, and enabling them to improve their practice through action research on their teaching, and the infusion of new technologies and methods into their practice. In many respects Singapore’s work is a model for the world.

In today’s world, individual and societal success increasingly depend on our capacity to learn, and societies rely, as never before, on our capacity to teach. So I want to take a special moment to acknowledge the great work of teachers – both the many teachers in all of the branches of NTU who helped you get to this wonderful launching point where you are today, and all the teachers in the years of primary and secondary school who helped you reach the university prepared to think, invent, and create. Teaching is the profession on which all other professions depend. Indeed, everybody who is anybody was enabled to become somebody by a teacher. As Mr. Lui Tuck Yew, then Minister of State for Education, pointed out:

Good teachers are at the heart of everything we do in the pursuit of educational excellence. Teachers are like gardeners – when they sow seeds, they need patience, toil and faith to help them grow. But once [these seeds] bloom and
flourish, they will continue to do so many years into the future, sowing their own seeds in time to come.

Now I’m not much of a gardener, but I do know that teaching is very challenging work, because it is not just about pouring information into the empty heads of students. Effective teachers must figure out what students already think and believe in order to help bring them to the curriculum – and bring the curriculum to them. And because every student has their own personality, viewpoint, and a unique starting point in their educational journey, teaching and learning are always somewhat unpredictable, and involve a bit of trial and error.

In my work, I often receive examples from teachers of the unpredictable ways in which students receive their teaching efforts. Students frequently apply their own logic, and it is often both amusing and interesting to see what students make of what they are taught. For example, on a 5th grade science test in one school district in the United States, the question was asked: “What are the four seasons?” One student replied: “The four seasons are salt, pepper, mustard, and vinegar.” When asked, “How do you keep milk from turning sour?” another student answered: “To keep milk from turning sour, keep it in the cow.” And finally, in response to the question, “What is thunder?” a student noted that “Thunder tells you how close lightening is. If you don’t hear it, you got hit, so never mind.”

So teaching is invariably complicated work, and we are all greatly indebted to the wonderful teachers who have, with patience and perseverance, lit our path toward understanding.
And teachers’ work is continually becoming more important as the challenges they must prepare their students for become ever more complex. Today, the nature of work and society is changing at breakneck speed. During much of the 20th century, most workers held 2 or 3 jobs during their lifetimes. However, in the U.S., our Department of Labor estimates that many of today’s workers will hold more than 10 jobs before they reach the age of 40. The ten jobs projected to be most in-demand jobs in 2010 did not even exist in 2004. Thus, the new mission of schools is to prepare students to work at jobs that do not yet exist, creating ideas and solutions for products and problems have not yet been identified, using technologies that have not yet been invented.

Those of you who are graduating today have acquired much of the knowledge you will need to begin to contribute to the professions you have chosen and are inspired to serve. You have also, I am sure, acquired the ability to continue to learn that is so essential to success in today’s economy and fast-changing world. The pace of that change was recently revealed in a study conducted by two professors at the University of California at Berkeley. Some of you may know that those of us from Stanford University do not usually like to quote our Berkeley colleagues – since we have quite a rivalry across the San Francisco Bay. (It starts with football and includes all things academic.) However, this is a remarkable study. As these professors track the rate of growth of new knowledge in the world, they found that between 1999 and 2002 – a three year period – there was more new knowledge created in the world than in the entire history of the world before that time. And the amount of knowledge in technical fields is doubling every two years.
So, those of you who are graduating are not done learning – you have only just begun! NTU has very consciously given you the tools to learn and innovate throughout your careers. The hope is that this spirit of learning will accompany you even after you leave school. In this country, as everywhere around the world, the capacity of people to continually learn, both for professional development and for personal enrichment, will determine the collective welfare of the entire society.

As former Education Minister Tharman has pointed out, to respond to these challenges schools and colleges must increasingly seek “to give students room to exercise initiative and shape their own learning, so [they] are engaged learners, [and are] interested and proactive agents in the learning process, with both the knowledge and the character and values that enable future success.” And current Education Minister Ng has observed that “Singaporean schools are constantly on the move, still seeking to improve. Across different decades, ministers, and administrations the common recurring motif is that ‘we treasure our human resource as the most valuable asset in Singapore.’”

Creating a dynamic learning environment that is always adapting and responding to new challenges has become a national quest in Singapore, and one that I greatly admire. Our new president in the United States, President Barack Obama, has issued a similar challenge to us, pointing out that the source of America’s prosperity – indeed the source of any nation’s prosperity – is not how we accumulate wealth, but how well we educate our people. Education is no longer a pathway to success; it is a prerequisite.

As an advisor to President Obama on education, I have tried to convey to my colleagues in the United States what I have learned from studying education systems
around the world that have created high and equitable levels of achievement.

Singapore is a nation from which I have learned a great deal. In addition to your schools’ emphasis on investigation and inquiry; the integration of technology; and preparing students for entrepreneurship and invention, Singapore – especially the NTU and the Institute of Education – is thinking about how to create a good world for the future.

I have seen in my visits to Singapore how a spirit of creativity and innovation is visible throughout the schools, which engage both students and teachers in experiential and cooperative learning, action research, scientific investigations, entrepreneurial activities, and discussion and debate.

You are working to create a truly multicultural society – one in which people can learn from one another and work well together. One important way this is being undertaken is by engaging both prospective teachers and their students in experiential, community-based service learning efforts, building empathy, compassion, and a sense of responsibility for the community as a whole. These values are essential to a healthy society. As Minister Ng has explained: “In an inter-connected world, and in our multi-racial society, it is necessary for our young to learn to respect differences and build strong and lasting relationships with those around them…. We have to teach our students to go beyond simply acquiring knowledge toward exploiting it to improve lives.”

At the end of the day we most need creativity and innovation in how to learn to live together on the planet, making decisions that preserve our environment, and that solve the diseases of poverty, hunger, war, and strife.
The American civil rights leader Martin Luther King, Jr. noted more than 40 years ago, in a point that is equally true today: “Our scientific power in the world has outrun our spiritual power. We too often have guided missiles and misguided man…. Ultimately, we must learn to live together as brothers or perish together as fools.”

We will need all of our know-how, ingenuity, and ability to learn to learn to solve the problems of humanity, to create a better world for our children and our children’s children. In this area of learning, as so many others, Singapore, through you, can help lead. As King urged:

Whatever career you may choose for yourself – engineer, businessman, or teacher -- let me propose an avocation to be pursued along with it. Make a career of humanity. Commit yourself to the noble struggle for human rights and to the search for solutions to the human problem of how we live together in harmony on this planet. Make it a central part of your life. It will make you a better engineer, a better business person, a better teacher. It will enrich your spirit as nothing else possibly can. It will give you that rare sense of nobility that can only spring from love and selflessly helping your fellow man. You will make a greater person of yourself, a greater nation of your country, and a finer world to live in.

Good luck to you in all of your future quests, and thank you for allowing me to be with you on this important day.