I am deeply honored that the University of Michigan has established the James A. Kelly Learning Levers Prize. When I first learned that this was being done, I was, literally, speechless. Nonetheless, I've been asked to find my voice and offer remarks at today’s seminar, at which the University is launching the Prize.

Thanks to all those at the University who decided to create this Prize and to launch it with the cooperation of many Schools and Departments across the University. I especially want to thank two outstanding leaders at this School of Education—Deborah Ball, dean of the School from 2005-2015, and Elizabeth Moje, who became dean in 2015.

I also want to recognize one other person who is responsible more than any other for the idea to create a Prize addressing this subject, and that person is my long-time colleague, frequent collaborator, sometime toughest critic, and close friend, Paul R. Dimond. The idea for this Prize grew out of many conversations over the years between us. Paul possesses a rare combination of keen intelligence, analytical insight, and visionary boldness that, when focused on an issue or idea, can only be described as extraordinary.

This Prize is about learning and the need for inventions to help learners learn more, learn more quickly, learn more deeply, take greater control of their learning, stimulate their creativity, learn how to think, and most importantly, develop and hone their capacity and disposition to become lifetime learners.

The University of Michigan will establish the rules and procedures for administering the Prize and decide how it will assist students interested in competing for it. My hope is that the University will encourage students throughout the University to consider competing for the Prize.

In these remarks at the “launch” event for the Learning Levers Prize, I'll discuss why the Prize has been established. I will discuss the economic and social contexts in which our society defines and offers opportunities to learn. I'll describe how traditional educational institutions are organized to offer opportunities to learn, and discuss how those institutions and systems impose major limitations on today’s learners. Finally, I'll suggest several targets of opportunity that are examples of huge opportunities for invention today and tomorrow, opportunities that I hope will be aggressively explored by students competing to win the Learning Levers Prize.
First, let’s consider the institutional perspective on learning. Societies have always found ways to assure that their citizens grow up with common understandings of the society’s core cultural beliefs and values, and with an understanding of what the society expects of them at various stages of their development. Much of this is shaped by the economic system in which the citizens live. For example, in the middle of the 19th century in the United States, over 95% of the population lived on or near farms. Most children helped with farm work during summers, and entered the full-time agricultural workforce in their early teens. Thus, most children were in school for six to eight years at most. Only children of wealthy and elite families went on to secondary school and to college.

In the late 19th century, manufacturing emerged as a significant economic sector, and jobs in the workforce began to require specialized training. As agricultural production became mechanized in the late 19th century and the first couple decades of the 20th century, children no longer had to enter the labor force in their early teens. These huge changes in the economy and labor market led directly to the emergence of widely-attended secondary schools offering further academic courses and vocational training. Gradually, high school graduation rates crept up, and graduation from high school became a credential required for many types of employment.

Schools were also performing essential socialization functions. Immigrants poured into the US from every part of the world, bringing with them their ethnic identities, their languages, and their political and social traditions. Schools attended together by all students helped tens of millions of children learn English and ready themselves for life in a pluralistic, democratic social order.

At the end of World War II in 1945, almost 15 million soldiers were no longer needed in the Armed Forces. (The entire US population at that time was about 150 million). If all these veterans tried to enter the job market all at once, widespread unemployment would occur. In response, the federal government created the largest educational voucher system in our history to provide tuition and support for living expenses for returning soldiers. Through this program, called the G.I. Bill of Rights, colleges and universities vastly expanded enrollments and within a decade, a college degree became the required credential for many jobs.

Thus a massive system of educational institutions emerged. In the US today, over 75 million children and adults are enrolled as students in educational institutions. Some five million are in nursery schools, with another four million in kindergartens. Over 50 million students attend elementary and secondary schools employing 3.5 million teachers in about 100,000 school buildings. There are about 15 million undergraduate students and about 3 million people are enrolled in graduate programs.

All of these institutions could be thought of as being in the learning business. They supply opportunities to learn.
To see how this works in the real world, let’s zoom in for a closer look at how this works in K-12 schools. To handle large enrollments, schools essentially “batch” kids by age; at age six, kids enter first grade; each teacher has about 25 or 30 students. At the end of first grade, the batch moves on to second grade, and on up through the grades. At that rate, high school graduation occurs at about age 17.

But there is a fault line that runs through this organizational arrangement. It is that kids are individuals. Each learns at his or her own rate and not necessarily at the rate assumed in the “batch” system. By the end of first grade, some students have just progressed at the rate specified for first grade and are ready to enter second grade. But at the end of first grade, some students may not have mastered the material and others may have zoomed ahead and be ready to learn what the age-grade system specifies for 4th or even 6th graders. Furthermore, students learn different subjects at different rates, so may be reading at advanced levels but have not yet come to understand the math that was expected for the first grade. But for all first-graders, regardless of what their actual individual achievement profile is, the next step in the “batch” system is inevitable —students move on to something called second grade, and thus begins the movement through the grades.

Great teachers in the early grades have developed ways to encourage learning at varying individual rates. Teachers form smaller groups of students making similar progress on particular subjects and issues. It’s amazing to watch skilled teachers manage these variations in individual rates of learning. But unfortunately, not all teachers are that capable, and this kind of pedagogical individualization of learning is seen mainly in the first two or three years of school. After that, students move through the system at “batch” speed.

What this means is that children and young adults have tremendous untapped capacities to learn at faster speeds, to learn more deeply, and to learn more broadly. Tapping into and stimulating this underdeveloped capacity is one way to describe the challenge of the Learning Levers Prize.

American schools did produce large numbers of low-skilled workers for the old economy, but that was then and this is now. Our economy has changed in fundamental ways. I’ve already mentioned the revolution in agricultural productivity; farmers today have college educations and utilize the internet in every aspect of their business. Similarly, factories that once employed tens of thousands of low-skilled workers per shift now employ far smaller numbers of much more highly skilled workers. Workers in traditional fields like plumbing and maintenance of infrastructure are still needed but must be trained to use the latest technology in their work. An increasing proportion of workers are employed in the service sector, and countries and firms that learn how to increase productivity in the service sector are likely to dominate the world economy in the years ahead.

What has emerged is an American economy in which workers themselves and their advanced knowledge and skills are the main assets of firms. Many of these highly-
trained workers become entrepreneurs, creating and re-creating their own firms. The fastest growing occupations all require higher-order skills and especially the capacity to continue to learn and adapt to new challenges. Workers who learn more will earn more; those who succeed will have the character and habits of mind to learn continuously, to work collaboratively with other highly educated workers, to take risks and launch new ventures.

The schools that most American students attend aren’t organized to prepare very large numbers of young people for the challenges they will face. Education systems in other countries have adapted to new challenges better than schools in this country. International comparative testing programs show that most American students achieve at levels at or below average when compared to students in other advanced countries. Students aren’t mastering the core academic subjects. Students seem to lack even rudimentary knowledge of the US Constitution or of our history, especially in sensitive areas like race relations and American involvement in wars in the past several decades. Too many schools no longer offer excellent programs in music, art, physical education, and health.

The hard truth is that students aren’t learning enough, and aren’t learning what is needed for them to succeed in the new economy. What is at stake is nothing less than the future prosperity of the United States. What’s needed is for almost all students to begin to learn how to meet higher standards, and how to develop much more independent control over how and what they learn.

This is true despite the fact that wave after wave of reform has swept across this educational landscape. Some reforms do indeed improve student learning, but too many of them focus schools on basic skills, not on the higher-order thinking skills students need to develop. Too often, reforms that are well designed from an educational perspective lack realistic political and organizational strategies for actually achieving change in the behavior and performance of the decentralized American school system.

I’ve worked most of my career to improve schools, to reduce inequities in how schools are financed, and to establish higher standards for what teachers need to know and be able to do. I’m proud of those accomplishments. They were necessary. Other reforms have resulted in world-leading programs to educate handicapped children, and to enable girls to compete in athletics. Efforts like them will continually be needed. But the harsh truth is that they are not sufficient. Year after year, schools offer opportunities to learn in the same old ways, in the same old classrooms, using the same old “batch” system, with the same old results.

The growing cleavages between rich and poor in our decentralized school system and the growing separation of children from different social classes and races means that opportunities to learn are not available equitably to all children. Ideally, the “common school” brought all children together, but today children of different economic groups seldom interact together. Perhaps technology can make opportunities to learn more directly accessible to poor and minority children.
We live in an era of revolutionary technological changes in how individual people communicate with each other. Access to virtually all of human knowledge is now available to most people through their computers, tablets and smartphones. We now have enormous potential to empower individuals to control, accelerate, and deepen their learning and their capacity to do productive work.

But before we get too carried away on a wave of euphoria, let’s also recognize that technology is just that—technology. Humans decide how to use it. The same smartphone that can be used to access incredible amounts of information for educational purposes can also be used to permit corporations and governments and criminals to invade our privacy. The same computers that permit students to be far more efficient in completing routine school assignments or to enable them to conduct scientific studies are also used to access an avalanche of entertainment options. The internet is used more to transmit and consume pornography than it is to enable students to study advanced science courses when their school does not have teachers qualified to teach them. And never forget that technology continues to change rapidly.

But the educational potential of technology is undeniable. Schools are increasingly bringing the internet into the teaching and learning process, and teachers themselves are in some ways leading the charge. Students tend to be more sophisticated and adept at using technology than their teachers. Nevertheless, the traditional organizational structure of schools remains an impediment. Their strategy for realizing the gains that technology offers seems to see technology simply as a method to improve effectiveness and efficiency within existing school organizations. It’s likely that schools ten or twenty years from now will still be organized to process batches of students at “batch” learning rates. By contrast, in many other economic sectors, technology has fundamentally disrupted traditional ways to produce and deliver products and services. This is why the idea of Learning Levers has such far-reaching potential.

A Learning Lever is defined as a digital tool that enables students to learn more effectively and to assume greater control over how they learn. The University of Michigan defines Learning Levers as tools that could include software programs, “apps”, games, and competitions, but also as problem-solving lessons, ways to facilitate collaboration among learners, and ways to conduct inquiry and discovery. Learning Levers could also include new ways to acquire feedback and for individuals and groups to collaborate as they study, investigate, and “cloud-criticize”.

Let me suggest three huge territories within education that call out for inventions that can improve student learning. I’ll suggest opportunities at three age levels of students: pre-school; summers during school years; and undergraduate studies in colleges. In each domain, inventions could help accelerate, deepen and broaden student learning.

The first is focused on pre-school years. Psychologists have told us for years that young children learn at phenomenally fast rates. Brain development in young children is well documented. But few elementary schools even suggest ways that intellectual
development of pre-school children could be stimulated and accelerated; in fact, to do so in any serious way would bring large numbers of children into first grade having already mastered much of what is taught during the first months of first grade. Traditional schools emphasize reading readiness in the kindergarten year and assume that most students wait until entering first grade to learn to read. Many children, however, are exposed to reading readiness materials and exercises when they are three and four years old, but this happens far more often in households with educated parents with upper-middle-class income levels. Let’s see some inventions that could help all three and four year old children be challenged to learn more about their communities, to be exposed to worlds of music, art and dance, to learn about the natural world around them, to start to develop habits of mind needed for good citizenship, and to begin to learn how to learn. In this way, individual children can start to learn when they as individuals are in fact ready to learn.

A second example is the subject of summers. Traditional school years start after Labor Day and end shortly after Memorial Day. Most schools are open for business about 180 calendar days of the year. Again, few schools suggest organized ways for students to use their summers to accelerate, deepen, and broaden their learning. Yes, some schools provide reading lists of books that students are urged to read. But the three-month hiatus during summers disrupts the habits and rhythms of learning and results in most students in fact “forgetting” some of what they learned during the previous school year. During those summers, students of all ages will have their smartphones in their hands virtually every day, but will not be challenged to use them for educational purposes. That is where Learning Levers can be created that motivate students to reinforce what they learned during the school year, and explore topics not in the official school curriculum.

A third area ripe for educational invention is the undergraduate years. Colleges provide opportunities to learn through organizational devices called courses. Progress towards a degree is measured by the number of courses completed. These are of course only proxies for the real thing—learning. Technology is now deeply involved in colleges—within courses, in doing research for papers, in communications among students and between students and professors. Students rate professors on line. Entire courses are offered online. Students are very adept at using technology. But let’s see some inventions that draw more students into in-depth investigation and collaboration about perplexing and troubling issues. Let’s see inventions that enable students to rate Shakespeare plays, or to compare and contrast how theories of aesthetics can be applied to contemporary theater, or to enable students at the University of Michigan to assist young learners in Africa, or to work collaboratively to refine how statistical methods to evaluate the performance of self-driving cars can more realistically reflect actual driving situations in major cities.

The University is wise not to impose unnecessary limitations on Learning Levers. Students who compete to win this Prize are not limited to pre-determined topics, methodologies, levels of education, or technologies. Speaking for myself, and I know also for Paul Dimond, we want to be surprised. We hope for this process to result in
widespread and intensive use of Learning Levers to support and encourage and motivate future generations of students to…well, to learn lots more, to learn lots more effectively, and to become life-long learners themselves.