LIFE CYCLE LEARNING:
KEY TO IMPROVING STUDENT PERFORMANCE

An essay presented to the
Social Science Association
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Honolulu, Hawaii
May 4, 1998

Good evening!

I have been agitated about intermediate schools and high schools since I was in them myself. I have had my list of objections for 30 years. For the past 15 years I have been involved in public speaking, writing, and working with committees and task forces on what I consider to be the many and obvious structural flaws and faulty assumptions of our secondary schools.

During the past few months I have gone into the field, and have spent a lot of time learning about what is happening in the State Department of Education. I have been reading department documents, and interviewing teachers, school principals, program directors, district superintendents, assistant superintendents, members of the Board of Education, union leaders, and legislators. What I have learned is that the DOE has many good people, who are up to date on educational research and practices, and who have launched programs which I think are the right ones.

I am not here to argue that the State Department of Education has no problems. However, I am feeling optimistic for the first time in 30 years. I believe that the right ideas, the right programs, the right assumptions, are beginning to emerge. They are still in early phases, mostly pilot stages, but they exist, and they give me great hope. What needs to be done, now, is to roll out the good programs into the rest of the school system. That is a huge challenge, but it can be done.

One reason that I am so hopeful is that the new programs I see are connected more and more with the developmental needs of our students. That is my topic this evening: “Life Cycle Learning: Key to Improving Student Performance.” My belief is that the breakthroughs in our public education system that we so fervently desire are likely to come when we stop ignoring what is really happening to our

children, and start connecting their lives with the curriculum and activities in our schools. Students will perform better when their education is better suited to their life cycles, meeting their needs at different stages of their development. The vision I wish to promote is one which is *both* academic and developmental.

From Factory to Team/Family

From my point of view, the biggest obstacle to success in our schools is the factory model of education. About 150 years ago, American education consciously adopted the factory as the model for our schools. That is where our current problems begin.

It is astounding to me that our current structure and assumptions regarding the organization of K-12 education were not based on any knowledge or theory about how children learn. There is really no educational basis for doing what we have been doing to students all these years.

David Tyack in his book, *The One Best System*, described the thinking among school leaders in the 19th century. The number of students in public schools was growing dramatically, and educators throughout America were looking for ways to rationalize the school system to manage the growth in enrollment. They seriously examined four models: The army, police departments, the railroads, and factories. They became enchanted with the factory, and chose it as their model for school organization.

Urbanization and industrialization were converging, and the scientific revolution was underway. Educators admired scientific, efficient production. Their watchwords were rationality, precision, impartiality. They were impressed with the division of labor, punctuality, order, regularity, and hierarchical controls.

William T. Harris, U. S. Commissioner of Education, emphasized that a modern industrial society needed order and conformity— "conformity to the time of the train, to the starting of work in the manufactory," and this required precision and regularity. Students had to be classified, and what they learned and when they learned it had to be standardized. The age of each student was easy to determine, so grade levels were established based on age. The systematic plan of gradation that was promoted in the middle of the century was based on a Prussian model.

Again— the creation of our current school system was not based on our knowledge of how students learn best. It was not based on educational research or an educational theory. It was based on a desire for administrative efficiency. Educators said that they wanted to make the school system *more bureaucratic*. It is evident that they succeeded.

Alternative models and structures

The 19th century factory model may have had some logic to it. In those days, students sat in class, listening to the teacher, and then did boring, repetitive exercises under the teacher's watchful eye. Then they graduated, and went to work in factories, where they spent their days doing boring, repetitive tasks under the foreman's watchful eye. But our economy has changed. Today we have few factories, but a lot of service industries and knowledge industries. Rather than the capacity to do boring, repetitive work, we need people to be creative problem-solvers and team members.

In continuing to use the factory model, we have not only kept a model which is badly outdated. We have also used a model which has cut us off from four sources of insight which could help us improve our schools: (1) Thousands of years of pre-industrial wisdom, (2) our wisdom and experience as parents and families, (3) useful advice from educational researchers and community leaders, and (4) the human life cycle. Each of these sources of insight that we have lost suggests a model or structure which can lead us out of the factory and into more effective and humane educational practices. These models are especially important for secondary education— intermediate schools and high schools. I will discuss each of these models or structures in turn.

1. Pre-Industrial Educational Practices

The first model or source of insight is pre-industrial. Some of the answers we need are easier to find in cultural anthropology than in the modern field of education.

Humans have lived in civilizations for about 10,000 years. The factory has been a model for education for only 150 years. What were people doing the first 9,850 years? Well, in pre-industrial societies, they used the family and the village as their model. There were two major functions for education: (1) to teach young

people the culture of the tribe or village, and (2) to teach young people the skills of survival— hunting, gathering, warfare, making clothing, making pots, constructing housing, and so forth.

I don't want to romanticize pre-industrial societies. For many of them, life was harsh, and not very democratic. Also, I like my cellular phone, e-mail, and modern medicine. But the pre-industrial educational system that I have described is what worked for the human race for about 9,850 years after civilization began— and probably tens of thousands of years before that. Let me highlight the elements: (1) teaching by parents and elders who love their children and are committed to the success of each of them; (2) teaching one-on-one or in small groups; (3) hands-on apprenticeships, (4) teaching skills which are vital to the survival of the children and their tribe; (5) teaching for mastery, persisting until mastery is reached, or as far as each child can go; and (6) the celebration of the mastery of skills and acceptance into adult status based on achievements which are of value to society.

When compared with pre-industrial practices, it is obvious that we have created a stark and empty environment for learning in our secondary schools. For example, we do little mentoring. By and large, school is impersonal. The elders are there, but they have too many students— each teacher may have 150 or 200 students. There is too little time to give individual attention. Education is a conversation, but the teachers have little time to talk.

Even worse, we quarantine our students in school buildings. We want our students to learn about the world, but we put them in school buildings, *away* from the rest of the world. We isolate them from the subject matter. The world is big, but our schools are small.

Even worse, we place students in classrooms where they are mostly passive listeners and receivers of information. We want them to be active and innovative, but we make them spend much of their time in a passive mode. The classroom tends to focus on the teacher as the giver of information, rather than focusing on the student as the learner of information.

So far as I know, there is no evidence that people learn best while seated in a classroom, facing the front, listening to a teacher. And yet, most of our educational programs are based on this structure. This is an enormous error, with far-reaching implications.

Finally, we make the mistake of assuming that students can learn to do something by studying it, rather than by doing it. We are not hands-on. When I was in high school, it was made clear to me that I was not living life— I was preparing for life. Life was what you did *after* graduation. I was explicitly told that students are not supposed to do real things in high school. But how do you prepare for life by not living? How do you prepare for reality by being unreal? How do you learn to do something by not doing it? The answer is that you don't. Pre-industrial societies have always known this.

2. Parental and Family Wisdom

In addition to looking at pre-industrial educational practices, we also need to think about what we know— our own wisdom as parents and families— about raising and teaching our own children. I have a seven-year-old, an eight-year-old, and a twelve-year old, so this is something I am still learning. My impression, though, is that teaching by parents and family members is usually based on love, commitment, mentoring, sharing, and encouraging. We encourage our children toward mastery. We take the greatest pleasure in every step forward. We are surprisingly patient. We praise what is accomplished, while pointing to new challenges and higher goals.

To put it another way, we give our children credit for what they know, instead of flunking them for what they don't know. If they don't get it, we keep helping them until they do. The goal is mastery, and we're not satisfied until it is reached. But it is all positive. A child who gets 20% of the material knows 20% more than nothing. If the child only knows 20%, she's not flunking, she's just starting.

The idea of flunking students comes from the factory model. A poorly manufactured item, a defective product, a low grade of beef, is rejected, tossed out, abandoned. The items which don't meet the standard are flunked. But children aren't manufactured items. They are unique individuals, each with some gifts, each with some challenges. We don't have to be committed to a low grade of beef, but we do need to be committed to our children. A defective product which is rejected by a manufacturing plant will never be used. By contrast, a young person who is flunked and rejected may leave school, but does not leave society. He or she still has a life to live— a life that will affect dozens, perhaps hundreds of other people.

What goes wrong in that life could cost society a great deal.

The desire to flunk students is the only reason I can think of for using a curve in grading. A curve guarantees that somebody will be on the bottom, and will get a poor grade. This is true whether the whole group is doing very well or very badly. I admit that it is human nature to compare people and things. But the educator's question should not be how well one child does in relation to other children. The educator's question should be how well all children are doing in relation to the standard— in relation to the material or skills that we want them to learn. The goal must be for all students to reach that standard. Rather than using a curve, we should certify how far each student has come, and keep the student moving toward mastery. That's what families do; that's what parents do; that's what educators should do.

3. The Three Circles

The pre-industrial family model and the parental and family wisdom model both offer us a different perspective that we can use to examine what we are doing in our schools. A third way of examining what we are doing is to look at the relationship between three circles: (1) what we know about how children learn, (2) what community leaders say they want our children to learn, and (3) what our schools are trying to teach. I believe that at present, these three circles don't overlap very well. That is one of our problems, and also one of our biggest potentials for improvement. We can bring those circles closer together.

For example, our schools are highly competitive. Individual students compete against each other in and outside the classroom. The research suggests that this individual competition is not the most effective way to learn or solve problems. The most effective way is cooperative learning, which involves instructional procedures that depend on students helping one another to learn in small groups. There are ways to do this while still evaluating individual performance and holding individuals accountable.

Johnson & Johnson, in a 1995 article on "Cooperative Versus Competitive Efforts and Problem Solving," published in the *Review of Educational Research*, reviewed 46 studies published between 1929 and 1993 (over 80% of them from the 1970s and 1980s). The 46 studies yielded 63 relevant findings. The findings were classified in four categories: linguistic, nonlinguistic, well-defined, and ill-defined

problems. Members of cooperative teams outperformed individuals competing with each other on all four types of problems, and in 55 of the 63 relevant findings. Cooperation outperformed competition regardless of the methodological quality of the study. The authors pointed out the obvious— that cooperators were better problem-solvers because they exchanged more information and insights, they generated more strategies to solve the problems, and they were better able to translate the problem statement into equations. They concluded that "on the job and in the classroom, cooperative groups will be better able to deal with complex problems than will competitors working alone." This is common sense: More heads are better than one.

Interestingly enough, this ability to perform in a group setting is one of the things that community and business leaders tell us they want our children to learn. In a number of studies or surveys, including the national report known as the SCANS report (Secretary's Commission on Achieving Necessary Skills) issued by the U.S. Department of Labor, community, business, religious, and educational leaders say that they want students to learn how to think creatively, solve problems, learn independently, teach others, work well in teams, be good at communicating, have strong interpersonal skills, know how to organize and evaluate data, understand organizational systems, and know how to allocate time, money, and materials effectively. The ability to read, write, and do arithmetic is just the beginning point. Students must be able to do more than the basics if they are to survive and thrive. The skills we most want are skills that are transferable, far above and beyond any particular course or subject matter. So, the question is: Where in the school curriculum do we teach these things?

At present, the most significant part of the school program in which students are learning cooperation and coordination to achieve team goals is the extra-curricular or co-curricular program. That is just one reason why the co-curricular program is already as important as the academic curriculum. Information is becoming more and more readily available. The challenge is to transform it into knowledge, and then apply it, for the benefit of society. *Knowing* something will not be enough. Knowing how to *use* knowledge will be the key. Knowing how to use knowledge *as a team member*, in creative problem-solving, will be especially valuable. Cooperative learning is one technique that can be used in the classroom to move us in the right direction. It is just one example of how the three circles— educational research, the advice of community leaders, and school practices can come together.

Life Cycle Learning

The fourth model is life cycle learning. For me, this is the unifying theme under which we need to rebuild our educational system. Rather than an educational system based on the convenience of administrators, it is obvious that we need an educational system based on the growth and development of students. What I mean by "life cycle learning" is learning that is appropriate to the stages in the life cycle of the student.

There are many theories about the cognitive and psychological development of children and youth. For many of us, the early foundational work of Erik Erikson and Jean Piaget come to mind. The research on the subject continues to expand. The important point is that *are* stages of cognitive and psychological development, and these obviously have a big impact on what children learn, when they learn it, and how they learn it. That in turn has a big impact on what parents and schools can do, and *should* do, to help children and young people learn and grow. What I will do with the remainder of my essay is to discuss some of the things that parents and schools can do to build student performance based on life cycle development.

Birth to pre-school

Let's start at birth. What we have learned in the past ten years about the development of the brain is startling. The brain has something like 100 trillion connections. We used to think that all the wiring for these connections was there at birth, and that differences in intelligence and attitude were genetically determined and therefore permanent. Current research says no, not so. There aren't enough genes to determine the complex wiring of the brain. The genes probably determine the main circuits, but the *environment* shapes the connections.

When a baby is born, some of the neurons in the baby's brain have already been hard-wired into circuits that control breathing, the heartbeat, body temperature, and reflexes. These functions are needed immediately at birth. But trillions of neurons are not yet programmed, and they connect to the circuits of the brain only in response to external stimuli. The richness and variety of the stimuli basically determine whether a child will be more intelligent or less intelligent, and with what kinds of intelligence. It is also during these early years that the brain becomes wired in ways which make a child self-assured or fearful, articulate or

inarticulate.

There are time limits, windows of opportunity for brain growth, after which comparatively little new wiring occurs. The optimum learning period which affects brain growth ends somewhere around age ten or twelve.

One of the implications of brain research is that nobody is born on a bell curve. With the exception of children born with physical disabilities, the bell curve basically does not exist at birth. It is what happens to the child in the first ten years after birth that influences where he or she will end up. One is not born into the bell curve, one grows into it, for better or worse.

The good news is that the things that make a positive difference in a child's development are things that all of us can help with. All of us can hug or talk to or sing to or play with a baby. All of us can help a baby to touch and explore things of different sizes, shapes, colors, and textures. All of us can play music for a child, or take a child for a walk, or play catch with a child. What this means is that all of us can change lives, doing the simple loving things that we all know how to do. It doesn't take an advanced degree to hug and love a child. It just takes an awareness of how important those simple activities are, plus the time and commitment to do something about it.

Unfortunately, with the shift to single-parent families and two-parent families both of whose parents work away from home, a lot of children are simply not getting the stimulation they need. That is one reason that daycare and preschool programs have become so important. Obviously, these programs are costly. However, research on preschools indicates that money invested in preschools can save four, five, even seven times the money that would otherwise have to be spent later on remedial education, crime, unemployment, or social welfare services. Early childhood education programs are not only the right thing to do for our children, they are the right thing to do for our state budget.

The importance of this early period, from birth to age five, has already been highlighted in an excellent essay delivered to our Association by Bob Midkiff. Bob is the Chairman of the Good Beginnings Alliance, which is now the principal planning and coordinating entity for early childhood programs and services in Hawaii. Among many things, the Good Beginnings Alliance is making the public more aware of the importance of the health and developmental needs of young

children, and is providing information to parents, in order to help them to better meet the developmental needs of their children. The Hawaii Community Foundation has provided support, and a public relations firm has been hired, to produce brochures and obtain TV and radio time for presentations on brain development and early childhood.

Our biggest potential for a breakthrough for our children, our schools, and our society, is in these early years. No other development period in the life cycle comes close in importance.

Middle School

While we have much to do in the birth to five year stage, we are in pretty good shape in our elementary schools. Our elementary schools are generally very attentive to the stages of physical, cognitive, and psychological development in children. In addition, teachers have the same students all year, and get to know them well. Schedules are comparatively flexible, there are lots of projects which call for integrating knowledge and skill, and there are field trips and visitors to the classroom. Elementary schools, overall, are the best part of the K-12 system.

Things take a turn for the worse at the intermediate school level. Where students used to have one teacher who really knew them, now they have seven or eight teachers, none of whom have the time to really get to know their students. Rather than being together all day, with flexibility in scheduling, the bell rings every 50 minutes and students have to change classes. Instead of a nurturing and encouraging environment, the student experiences a cold, impersonal environment. In short, when intermediate school begins, we stop being attentive to the developmental needs of our students.

There is research which suggests that it is not the timing of a shift to intermediate school, but the nature of the shift, that makes it difficult for students. An analysis of the research conducted by Eccles and Midgley in 1989 concluded that an intermediate school student experiences more teacher control, more whole-class instruction, more competition and social comparison with other students, less personal contact with teachers, and fewer opportunities to make one's own decisions than an elementary school student. The intermediate school student's ability is being assessed in new ways which create anxiety over one's relative ability and performance, at the same time that the student is being given less

support and less personal control over the situation.

The result can be a decrease in self-esteem and negative attitudes toward school and learning. There has been at least one discouraging study which documented that the self-esteem of one group of students actually went *up* when they dropped out of school. It's not too hard to understand why such students would drop out of school and join gangs, to achieve a sense of self-esteem and social importance.

Individuals vary, and student development is a complex issue. There is a lot we don't know. However, we do know that young people face a lot of questions in regard to their own personal lives, such as how to interact with others, how to love somebody, how to get along with parents and friends, how to decide what is right or wrong— in short, how to live. Establishing values, seeking one's own identity, learning about the opposite sex, developing sufficient skills to feel of value to society— these are very important stages in the lives of our secondary students. These developmental issues are obviously more important to the long-term success of our students than knowing the dates of the American Civil War, the length of the Amazon river, the periodic table of elements, or the correct diagramming of a sentence.

Certainly, the school should not be the only place where life issues are worked out. We would like them to be worked out at home, in extended families, and at church, for example. But the developmental needs of students should not be ignored in the design of the school and its curriculum.

Let me tell you about two programs which have been introduced into our intermediate and high schools here in Hawaii which give me hope in this regard. The first is the concept of the Middle School. According to the National Middle School Association, the Middle School is an educational response to the needs and characteristics of youngsters during early adolescence, and deals with the full range of intellectual and developmental needs. In other words, the idea is to take the life cycle needs of students into account in designing the curriculum and providing services.

Here in Hawaii, the DOE has begun to convert intermediate Schools into Middle Schools. In my talks with school principals, they have highlighted several factors that make their Middle Schools different from Intermediate Schools.

First, three or four teachers form a team, and the team takes responsibility for tracking and advising about 110 or 120 students. These are students that they have in their own classes, allowing them to compare notes, and look at a student's total performance at school. Second, teachers are freed up to do more advising, so that students have one-on-one time with their teachers. Third, each student has a teacher who serves as his or her advocate in the school. The idea is to link up with students and get to know them better, spend more time with them in one-on-one advising, and seek to identify and then advocate whatever they need to succeed in the school.

I am intrigued by a pilot project known as CSSS— Comprehensive Student Support System— which has similar goals as the Middle School. This program has state legislative support, especially the support of Rep. David Stegmeier, Chair of the Education Committee in the House. The mission of this program is to provide students with a coordinated support system, both inside and outside the school. This means involving fellow students, educators, families, and community members as partners in creating a supportive and effective learning environment. The idea, as I understand it, is to try to find out what each student needs to learn, and then make sure the student gets what he or she needs, from whatever people or programs may be available. Quite frankly, I'm not sure yet what all this means, but I think it means that there are programs, services, and human resources we can tap into in order to support our students, if we can identify their needs and coordinate family, school, and community resources in responding to them. I see promise in this.

High School

A lot of good work has been done nationally on ways to improve or redefine high schools. My favorite is the work of the Coalition of Essential Schools, headed by Dr. Theodore Sizer, who has reported his research in the trilogy, *Horace's Compromise*, *Horace's School*, and *Horace's Hope.* One of Sizer's recommendations is greater use of projects and exhibits, which require students to integrate their knowledge and skills to produce a product that they can display to the school and the community.

I strongly agree that we need to shift more and more of our education away from courses on subjects, toward integrated projects. Most of our work, in our daily lives as adults, requires us to do projects— to integrate knowledge and skill.

That's what our students should be doing— through science fair projects, or drama, or a student business. A science fair project requires theoretical work, laboratory or field work, and the construction of a display case or exhibit to help explain the results. Writing and acting in a play requires language skills, perceptual skills, acting skills, and often a good hand with a hammer, nails, and paint. Running a business as a Junior Achievement project requires conceptual, managerial, mathematical, production and sales skills. And so forth. While doing a project, students learn how to integrate knowledge and skill to produce a tangible product which they can share with the community. What they learn can be used for a lifetime, long after memorized facts are forgotten or have become obsolete.

In addition to projects, we need to help our students link up with the world of work. A program which helps to do that in our public schools is the School to Work program, a federal program which is providing $10.2 million to the State over a five year period. The federal School to Work Opportunities Act was signed into law in 1994. It is not a narrow vocational program, but a program which is designed to help *all* students learn about careers, and learn what skills are necessary to perform in those careers.

The program is both school based and work-based. The focus during elementary schools years is simply awareness of work sites. Children visit businesses or offices, and see what people do on the job. During their Middle School years, students explore careers, either on their own or with counselors. During their high school years, students start preparing for careers, by job shadowing, or internships, or apprenticeships, or workplace mentoring programs. Meanwhile, from K to 12, practical workplace skills are emphasized in the curriculum, so that students not only master core academic skills, but learn about the skills they need in the world of work.

During this school year, 233 of our 245 public schools are receiving School to Work funds, while another ten are implementing some School to Work activities without funds. Only two elementary schools are not yet involved in any way. I have talked with public and private school principals who are very enthusiastic about the program, including the revamping of school curricula to better align it with what students will really be doing for the rest of their lives. As of last year, half of all high school students have been reached through curriculum changes with work-based learning references.

There are a number of good things about this program, but in the context of my essay this evening, I want to highlight the fact that the program fulfills the developmental needs of students— needs which used to be met under the old pre-industrial model: Students learn about the world they will be entering, and gain skills which they know will be valuable to themselves and others throughout their adult lives. This can give them the confidence that they can make it in the world— they can succeed, and they can contribute. This in turn gives them something to work toward. Rather than dropping out, they can link up.

According to psychologists, part of the identity development issue for young people is occupational competence. In the School to Work program, we are getting students out of school and exposing them to, and letting them contribute to, the real world of work— the adult occupational world. I have talked with one principal who says that his students would die rather than miss the days they do their internships at their companies through the School to Work program. The students dress better, they are punctual— it's great, he says. Here is a program which, among other things, directly addresses the developmental need of students to be of value in the adult world of occupations. It is another element in life cycle learning, focused on linking the student with life after K-12 education is completed.

Student Performance

My title is "Life-Cycle Learning: Key to Improved Student Performance." How will life-cycle learning improve performance? First, if we attend to the early childhood years, brain development will improve, thereby improving the *capacity* for performance. If children are loved and stimulated appropriately, their brain development will also include positive emotional and social development. One hoped-for side effect of appropriate attention to the early childhood years is that fewer children will need special education.

The full roll-out of the Middle School concept and the Comprehensive Student Support System will improve performance by keeping more students in school, engaged, advised and supported. Education is about people, about teachers and students, and their conversations. Unlike traditional junior high schools or intermediate schools, Middle Schools are designed to keep the conversation going. It is hard to keep the conversation going if the harshness of the school environment leads to students dropping out, mentally or physically. It is too early to offer proof that student performance in Middle School will go up, compared with traditional

schools, but there is a strong possibility. Students learn more when they are both challenged and supported, keeping them engaged in learning.

In our high schools, an emphasis on projects, cooperative learning, and career exploration and preparation, should improve student performance both during school and after graduation. Students learn about the world of work, and *why* they need to learn certain skills— both academic core skills, and additional skills for the workplace. This is motivating, and it is directly relevant to performance. It is too early to offer proof of the impact of activities funded by the School to Work program, but the anecdotal evidence is very positive. What is most encouraging, I think, is that improved performance in this area means improved performance not just at school but throughout one's life.

A fundamental question, of course, is how to measure student performance. I would argue for a range of measures and assessments. The public, of course, relies heavily on SAT scores to judge a school system's performance. There are two reasons that this is unfortunate.

First, SAT scores relate strongly to socio-economic level. Remember the research on brain development: Those babies and children who get less stimulation, have less brain development. Children in lower socio-economic environments may be born to parents who have less education themselves, and who may simply offer fewer educational advantages at home, including less stimulation in the early years, and less help with homework in the intermediate and high school years.

Second, SAT's measure a fairly narrow range of skills. They measure vocabulary, verbal skills, and mathematical skills. Those are all very important. However, SAT's do not measure many other things, such as the skills that are highlighted in the SCANS report, that most employers are looking for— the ability to think creatively, solve problems, learn independently, teach others, work well in teams, be good at communicating, have strong interpersonal skills, understand organizational systems, and know how to allocate time, money, and materials effectively. SAT's don't measure these things, and yet students need to learn these things if they are going to succeed throughout their lives. Our educational system is not succeeding if we graduate students with high SAT scores who don't know how to work, or be effective citizens.

The point is not to throw out the SAT. The point is to develop other assessment

tools, to use alongside the SAT. The Board of Education has adopted performance standards, which schools are beginning to work into their curricula. The assessment piece obviously has to come next. It should include writing samples, portfolios, projects, and exhibits which can supplement standardized tests like the SAT.

Actually, I think that life cycle learning will result in higher SAT scores, but that will not be the most important result. The most important result will be to prepare students to perform better throughout their lives— in school, in college, in their work, in their roles as citizens, in their family responsibilities. Life cycle learning can help students experience the joy of learning, and prepare them to continue growing and learning as our society and our economy change.

Educators are fond of saying that they are preparing students for life. But life is not what it was when the factory model was adopted. If we can shift to the life cycle model, incorporating pre-industrial practices, parental wisdom, and the advice of educational researchers and community leaders, we can truly prepare students for the lives they will be living in the 21st century.

Thank you.