

MODERATOR: Well, good morning everyone. I'm glad everybody made it here this morning on this winter Wednesday. And I'm particularly excited to introduce to you our speaker for this morning. Tony Wagner founded the Change Leadership Group, CLG, at the Harvard Graduate School of Education, and has served as its Co-Director since 2000. An initiative with the Bill and Melinda Gates Foundation, CLG helps teams to be effective change leaders in school and districts. Dr. Wagner also consults widely to schools, districts, and foundations around the country and internationally. His previous work experience includes 12 years as a high school teacher. He was a K-8 principal, a university professor in teacher education, and founding Executive Director of Educators for Social Responsibility.

Dr. Wagner is a frequent speaker and widely published author, and you can get your books signed today if you wish. His book includes numerous articles, and the book today is "The Global Achievement Gap: Why Even Our Best Schools Don't Teach the New Survival Skills Our Children Need -- and What We Can Do about It." So, after today's session, we will have available for you, you can purchase Dr. Wagner's book in the exhibit hall in the red room. So, without further ado, please give a warm welcome to Dr. Tony Wagner. [audience applauding].

DR. TONY WAGNER: Good morning. Good morning, everybody.

AUDIENCE: Good morning.

DR. TONY WAGNER: Nice to be back to Pennsylvania, great to see you guys looking so bright and shiny on this winter morning. I'm -- I want to apologize in advance, I'm feeling a little bit under the weather. But nowhere near as under the weather as my wife, who's currently experiencing a blizzard back in Boston. She's seriously under the weather. Just spoke with her a few minutes ago. I feel, actually, very guilty standing here without a shovel in my hand when she's otherwise occupied. But she'll be fine. She's kind of a pioneer spirit.

Could we have the first slide, please? Actually want first and second slide. No? There we go. Let's go to the second one, please. Oh, where's my clicker? I have a clicker here, don't I? I don't have to ask you that. Aha! There we go. Okay. You know, we in education have an affliction I like to call answeritis. As you heard, I'm a recovering high school English teacher and school principal. I mean recovering in the best sense of the word. I've, by the way, spent my first 5 years teaching at-risk students in an alternative public high school, so I have a particular affinity for the work, the very important work, that you're doing. But I've also seen in education this tendency for us to glom onto answers without asking the questions, to embrace solutions without always understanding the problem. That's why I love this Einstein quote, "The formulation of the problem is often more essential than the solution." So let me offer a perspective on the challenges we face in education today, and then explore what I see as some of the important steps we need to take to address those challenges.

First, a quick summary. We in education are caught between a rock and a hard place, caught between two immutable social forces that we must understand if we're going to succeed with today's

students. Number one, in the new global knowledge economy, all students need new skills. In a quarter of a century, we've transitioned from an economy where most people earn their living with these, to an economy where if you don't have a skilled one of these, you are never going to earn more than minimum wage. That's what a knowledge economy means. It means that everybody has to use their minds to earn a living. That's half the problem. The skills for work, the skills for continuous learning, and the skills for active and informed citizenship have converged. They're the same skills. So we're not just preparing people to be automatons in a factory assembly-line way of thinking about work. It's a very, very different world. That's half the problem.

The other half of the problem is that this generation of students, whom we call the Net Generation, is very differently motivated to learn and to work. And as you well know, working with your students, boredom is the leading cause of low achievement and student dropouts, which leads me to suggest at the outset that we need to reframe the education challenge. For 25 years we've been talking about failing schools. And you know what that means. If there's failure, somebody's to blame. So who's to blame? We are, educators. And you know how that works, right? The high school teachers blame the middle school teachers, who blame the elementary teachers, and we call that curriculum articulation, don't we? [audience laughing]. But, in fact, don't worry because really, we teachers all agree that it's the parents' fault. [audience laughing]. So I'd like to suggest, with respect, our first challenge as leaders, and all of you I think are leaders, our first challenge as leaders is to reframe the education challenge.

This is not about failure and this is not something a few reforms are going to fix. A little more testing here, a little more common course standards there, that's not going to solve our problem. Rather, the problem is to understand that our education system, now more than 100 years old, is fundamentally obsolete and needs reinventing, not merely reforming, unless you think that a utopian notion. I'd like to remind us that we reinvented the one-room schoolhouse beginning 150 or so years ago and invented the factory model assembly-line schools to go with our urban, industrial society. So reinvention is something that we need to understand is ongoing. As society changes, so too must education.

All right, so let's go into a little more depth here. How many of you read the book "The World is Flat" by Thomas Friedman? Raise your hands. Most of you, wow, that's impressive. Took me a while to get through that book and I only read it because my wife told me to. But I was glad I did because, as you know, he describes this new world where increasingly any job that can be turned into a routine, white-collar, blue-collar, service, manufacturing, doesn't matter, is rapidly being either off-shored or automated. And when I read that book, I began to worry. I began to worry about what kinds of skills will our young people need to get and keep a good job in this new economy? And are they the same skills they'll need for continuous learning and the same skills to be an active and informed citizen in a vibrant democracy?

So I decided to do a very different kind of research. I decided to talk to senior executives to understand what were the skills that they saw as most important, what did they see as the greatest gaps. So I talked to a very wide range of senior executives, literally from Apple to Unilever to the US

military. I talked to college teachers, asking them the similar questions. I talked to community leaders, same questions. I talked to students themselves, recent graduates, asking them in what ways they felt most and least well-prepared, as well as what motivated them. And I came to understand that in addition to what we would call the habits of the heart, in addition to the importance of character, which is something we've all been -- understood to be the kind of bedrock of good education, in addition to developing the qualities of generosity, moral courage, humility, and so on, as well as a strong work ethic, there's a set of core competencies which I call the seven survival skills, that every student must master, not just to get and keep a decent job, but also to be a life-long learner and an active and informed citizen. So let me describe them briefly to you and how I came to understand them.

Critical thinking and problem solving. Over and over again I heard from executives of the leading companies or non-profits in any sector that what gives them the edge, what makes them the best in their -- whatever sector they're in, is that they engage every single employee in a process of thinking constantly about how to improve their product or their process. Quick example, US military used to have experts that would go and write manuals about how to conduct battle. They'd go to battle, they'd come back, and they'd go to war colleges and they'd sit up there like experts in their ivory towers and write these battlefield manuals. Well, they still have battlefield manuals, but they're not written that way anymore. They're written as wikis and every soldier is expected to contribute new learning, just-in-time learning, because of the constantly evolving state of warfare. And it's the same in every business or industry.

But what's so interesting to me is that when I actually began to explore what these executives meant by critical thinking, I began to get a little uncomfortable. Because you know, for us, critical thinking is kind of a buzzword. We educators say, "Well, critical thinking means thinking critically, it's kind of a circular thing." We don't have to define it because we're not accountable for it. So it's too often a buzzword. Whereas in the world of work, in the larger community, what I came to understand is, first and foremost, critical thinking is the ability to ask really good questions, to ask the right question. And I got uncomfortable because, as you know, much too much of our curriculum is about getting the right answers versus asking the right questions.

Collaboration across networks and leading by influence emerged as a seven skill. I came to understand that, increasingly, all work is organized as teamwork, but that the ways in which those teams are organized is very different than 25 years ago. First of all, more and more teams are meeting virtually. They're not having to be in the same room. When IBM, for example, has a new problem or customer need, it pulls together a team from all over the world, all of its different sites, to work on that problem virtually. But the ways in which those teams are led are also profoundly different. They're led by peers through influence. It's not a command and control structure any longer. So how do we give every student the experience of working collaboratively when we in education are working in what is arguably the most isolated profession in modern work life? Few of us have really ever experienced teamwork in our work setting over any sustained period of time. And how are we going to ensure that every student has the experience of learning how to be a peer leader, not just those kids who rise to the top in the co-curricular activities?

Agility and adaptability, especially in this new economy, being able to pick up a new problem, to solve a new question on a moment's notice is one of the most highly prized skills or attributes. You've got to be agile and adaptable because the markets, the world, is changing so quickly.

Initiative and entrepreneurialism. It was Mark Chandler who is Vice President and General Council at Cisco Systems, who said to me, "You know, people who lead large organizations lay awake at night worrying about how to keep that entrepreneurial spirit and sense of initiative alive." He said, "If I have an employee who sets and meets five goals, 100%, that's no longer good enough." He said, "If, on the other hand, I have an employee who sets ten stretch goals, and perhaps only succeeds at eight, he or she is a hero." But what would that person be in our schools? Well, they'd be a B or a C student. They would have missed two or three, right? More significantly, I've been doing research for a new book, which I'll talk a little bit about in a moment, called "Learning to Innovate and Innovating to Learn." And I've been going to some of the most innovative companies in the world, trying to understand how they think about innovation. And fundamentally, over and over again, what I hear is the importance of failure as an indispensable part of innovation. We call it trial and error, but it's really failure. In fact, places like Google and IDO say, you know, "Fail early and fail often." That's a motto. And at the d.school at Stanford, they said, "Well, you know, we're kind of thinking F is the new A." Whoa! That's a challenge to our grading standards, isn't it? But more profoundly, how do we encourage responsible intellectual risk-taking? How do we encourage students to try new and difficult things? And how do we take the penalty of failure out of that learning process?

Effective oral and written communication. The number one complaint of both college teachers and employers is that kids can't write or speak effectively. Senior executive at Dell said to me, "You know, the reason these kids can't write is because they don't know how to think. They don't know how to reason. They don't know how to lay out an argument." And he said, "That's only half the problem. The other half of the problem is they don't know how to write with voice. They don't know how to put their own passion and perspective into their communications, and so be more persuasive."

Accessing and analyzing information. We all know this, the amount of information is growing exponentially, changing constantly, and it's right here. It's on every Internet-connected device. For me, it raises a profound question of -- I don't want to get into a debate about this, but the question would be, why memorize anything when you can look it up? I'm not -- I think there's an answer to that, but I think it does call fundamentally into question our kind of fact-based, recall-based curriculum. What happens, for example -- you know, textbooks are obsolete today before the ink is dry. So what happens when iPads become the new textbooks, or their equivalent? Which they will be, no question. Will we be prepared to teach in fundamentally different ways and teach about enduring concepts, and not just bunches of facts?

Curiosity and imagination surprisingly emerged as a core quality that is highly valued. In fact, more and more people are, instead of getting MBAs, Masters in Business Administration, are getting MFAs, Masters in Fine Arts. How many of you read Dan Pink's book called "New Mind"? Raise your hands. I would encourage you to read it, especially for the kinds of students with whom you work.

Because he talks about the importance of so-called right-brain skills, curiosity, imagination, creativity, empathy, as being increasingly important in this new marketplace, where people want goods and services that are something special and something different.

But I've been worrying about something else recently, which is what's led me to work on this new book, "Learning to Innovate." Let me give you a couple facts, scary facts. Nearly 75% of our economy has been based on consumer spending for decades, three-quarters of our economy. We used to have an economy based on making things, now we have an economy based on buying bunches o'stuff other people make. And worse, we buy it on credit. The savings rate in 2007 was minus 2%. Now all of that's come tumbling down. Savings rate today is 6 ½ % because people are frightened. They're frightened they won't have a job, especially when nearly one in five Americans today is either unemployed or underemployed. So, what I'm worrying about now is what is going to be the engine of our economy in the future? What's going to be our niche? What's going to be our competitive advantage, if you will?

And I think it has to be innovation. Instead of being a consuming economy, we have to be an innovating society. Now people say, well, we've always been innovative. We'll always be the most innovative in the world. That's not true. In fact, other countries are -- scored much more highly on the innovation indices now. And the other question would be, have we been innovative because of our education system, or in spite of it? Trivial Pursuit question of the day, what do Bill Gates, Edwin Land, invented the Polaroid instant camera, Martin Zuckerberg of Facebook, and Bonnie Raitt, the folk singer, all four, have in common? They all dropped out of Harvard to pursue their highly successful careers. So what I'm really interested in is the question of what would colleges have to do to not merely retain those highly innovative individuals, but to help really develop those skills? What will we have to do differently to develop the skills of innovation and entrepreneurship? What will parents have to do differently? That's what my new book's about, so stay tuned. Be out in about a year, 14 months.

So what I've come to understand, I'm going to back up for a second, is that there's a set of core competencies, as I've said. But meanwhile, back at the ranch, that's not what's going on in schools, as you well know. My day job for the last decade-and-a-half has been to work with educators who want to become change leaders, which means that I spend most of my time out in schools and districts around the country and occasionally internationally. Very little time in Cambridge. And so I spend a lot of time visiting classes, observing classes. Because for me, to be a change leader is, first and foremost, to be an instructional leader, to focus on what is effective instruction and how do we continuously improve all of our lessons.

So let me paint you a few portraits, a few portraits of schools. I'm with the head of one of the most elite independent schools in the country, not a place I spend much time, but there I was. And she said, "You know, I worry. I worry the longer our kids are in this good school of ours, this K-12 school, the less curious and imaginative they become." Let me take you into some classes to help us understand that concern. I'm in a school district that is ranked among the top three in a state that is ranked among the top two or three in the country, somewhere up northeast. And this school district has an average

median income of about \$175,000. Think there's any relationship between test scores and income? No, there couldn't be, otherwise we'd be talking about it, wouldn't we? Close the achievement gap, let's talk about closing the income gap.

So I'm with the superintendent who wants to be an instructional leader. I said, "Great." So we're going to go visit her high school because it's a requirement. We do, you know, gather base-line data, looking at classes. This high school is ranked among the top 50 in the country according to a national publication. I say, "What do you want to look for today?" She said, "Well, I want to see evidence that every student is being challenged to think." I say, "Oh good." But she says, "I only want to go to the honors and advanced-placement classes today, okay?" Hedging her bets. But I agreed because I kind of had a sense of what we'd see. So we went to eight classes that day. I'll just describe one for you because it kind of was typical of the day. It was advanced-placement government class, AP government. Teacher had just given back an 80-question multiple-choice practice test, apparently legal. And he said, "Okay, now we're going to talk about extended response. Extended response questions, very important."

By the way, do you know how extended extended responses are? Three sentences, four sentences, that's it. Unlike International Baccalaureate, where you have to write a 4,000-word research paper. You could get through an entire AP curriculum and never write a research paper. Not -- I don't mean to be knocking AP teachers. I think they are victims of an obsolete curriculum. [cell phone sound]. If it's for me, tell them I'm not here, will you, okay? [audience laughing]. Tell them I'm busy. But if it's my wife, well, never mind. So, he says, "All right, now look at this question. This question is about the iron triangle, right? Who can tell me what the iron triangle is?" You all know what that is, don't you? What? Well, I didn't either. I had to google it that night. And only one kid knew the answer. He's sitting in the front row. He mutters a response none of the rest of us can hear because of the overhead projector. Teacher goes, "Great, right. Now give me three reasons why the iron triangle is considered undemocratic."

By the way, the iron triangle's not that thing you ring for lunch at the ranch. That's an iron triangle too. But this one is the military industrial congressional complex. That was the answer he was looking for. And when I spoke at a leadership retreat of very senior military officers a few months ago, they didn't know what it was either. Really scary, and they're one of them. All right, so meanwhile, there's only one kid who knows the answer, three reasons, he raises his hand, the teacher goes, "Right, great." But he's looking at his watch, this is taking way too long.

He throws the second question on the overhead projector. He says, "Okay, now this question is about bureaucracy. Let me tell you how to answer this question." Theoretically a college-level course. No wonder so few colleges are giving subject content credit for these courses any longer. End of the day, I debriefed with the superintendent, and I said, "How do you think we did according to your index of thinking?" She said, "I'd say we went zero for eight today." First time this superintendent had ever gone unannounced into a classroom in her career as an administrator, and the -- her key take-away was she needs to be in classrooms all the time.

A few months later, I'm working with the program officers of the Bill and Melinda Gates Foundation in the South. They had given a number of grants to create early college high schools, high schools that are located on the campuses of community colleges, in many cases where students begin to earn dual-credit and have the chance of getting a dual diploma. But the whole premise is that they really start doing college preparatory work in tenth grade, ninth and tenth. So we were visiting three schools that had been working for a couple of years. We randomly selected six classrooms in each of the three schools to see how they were doing. Also to calibrate our perceptions of what we were seeing. Went to 18 classes, we debriefed after 2 days, we spent a half a day debriefing each individual class. Then we concluded that in only 1 class out of 18 did we see college preparatory work going on.

Let me describe another one that didn't make the cut because it was not an AP class, it was an advanced-placement chemistry lab. Sort of like home economics, you know? The recipe for the lab is up on the board and kids are cooking away, in this case on their Bunsen burners, right? So I'm watching this group of four students down here because there's some smoke curling out of their Bunsen burner that's not supposed to be there. And I'm curious about how they were going to solve this problem, right? So they're just standing there kind of like this, right, kind of looking at each other, talking. Teacher's over there grading papers. They're waiting for him to come over. So I can't resist, I have to go talk to them. So I go up and I say, "Little problem with your experiment?" They go, "Uh-huh." I said, "Do you have any idea what went wrong?" And they go, "Uh-uh." I said, "Well, what's your hypothesis for what might have gone wrong?" They go, "Huh?" And I said, "Do you know what a hypothesis is?" And three of the kids are shaking their heads, one kid's scratching his head, and he says, "Oh yeah, wait, wait, wait, that was a vocab question on the test last month. Isn't that like an idea of something that's supposed to happen?" These students did not have the first understanding of the scientific method, supposedly doing a college-level course.

Folks, what I've come to understand is that, through no fault of us as educators, there is increasingly only one curriculum in our schools. And an echo in this room. How did that suddenly start happening? But there's one curriculum in our schools. Whether it's AYP or AP, the curriculum is increasingly test-prep. Now I believe in accountability. I believe in assessment. The problem is we are trying to do accountability with obsolete measures. We're trying to do accountability with primarily factual recall, memorization-based multiple-choice tests that tell us nothing, nothing at all about readiness for careers, readiness for continuing learning, readiness for active and informed citizenship. So I've been in schools and districts that are making AYP, but failing their children. Failing first because, after tenth grade, they basically pay very little attention to who's going to graduate and who isn't. Our high school drop-out rate remains at about 30%.

So this is what I call the global achievement gap, and it's the gap between what even our best schools are teaching and testing versus the new skills all students will need in the 21st century. And it's a gap that has profound influences on how we are going to grow as a country in the future. You know, there's something called PISA. How many of you know the PISA test, Program for International Student Assessment? It's an international test, 67 countries took it most recently, 67 countries around the world. But here's the difference. PISA, unlike our tests, are predominantly open-ended, constructed-response

tests that assess thinking skills and your ability to apply what you've learned to new questions or new problems. So that's what PISA is. It's a 21st century test. So how did we do? This is the latest data. This was released 3 weeks ago. Fifteenth out of sixty-five countries in reading. We're about average in reading, that was our best. Science, in the lower two-thirds, 23rd out of 65. Math, 32 out of 65. College completion, we were number one in the world as late as 1995. And today, we've dropped to 12th. One out of every two students, who, if they complete high school and get into college, drop out, leave. Folks, the challenge is that we don't have an education system that is going to create the jobs and the opportunities our young people need. And that's half the problem.

The other half of the problem, and I'll be much briefer on this half, is that this generation is very differently motivated to learn. So it is not enough to merely focus on the new skills all students need. We also have to focus on how we motivate today's students. First and foremost, this is a generation growing up tethered to the Internet 24/7. There's another bit of feedback here, maybe it's this mic, if somebody could turn it down. But what's so fascinating is that, for them, a bad day is having a slow Internet connection. [audience laughing]. It's their life. And I actually, by the way, I kind of sympathize with that. I was stuck with one a few weeks ago. But it -- what they're doing on the Internet is what's so interesting and different and that we need to understand. They're using the Internet to create different kinds of friendships that are not clique-based. They're using the Internet to just explore ideas and possibilities. Kids google stuff for fun.

I rarely see disruptive behavior in classes, but increasingly now, I'll see a kid or two in the back suddenly googling what a teacher is talking about to see if it's still true. [audience laughing]. And finally, they're using the Internet as a tool for self-expression. In other words, this is a generation that is multitasking in a multimedia universe everywhere except in most of our schools. And we need to understand the power of these technologies as tools for learning. And let me be clear here. I don't see technology as a panacea. I see it as a double-edged sword. On the one hand, we have to teach kids how to use and harness these technologies with wikis and e-portfolios and Internet research, and so on. Extremely important. On the other hand, we have to be concerned with the fact that these technologies are addictive. They're habit-forming.

Kaiser Family Foundation did a study, follow-up to a study they did 5 years ago, asking how many hours a day were kids ages 8 to 18 spending on electronic devices? Anybody want to guess? Seven hours and thirty-eight minutes a day, after they'd done their schoolwork. Up 1 full hour from 5 years prior, and this was before the advent of Twitter. And when they counted multitasking, it was up to 13 hours a day on devices. So folks, we're going to have to, on the one hand, bring technologies into the classroom for learning that we're not now using, but on the other hand, help young people develop the understanding that they can't always multitask, help them develop the muscle of concentration and sustained focus on one thing at a time because that's what quality work demands. We're going to do both.

This generation also has less fear and respect for authority, in case you haven't noticed. They're -- yeah, they're kind of in our faces, but not in a kind of an aggressive way. It's very interesting. They just

simply believe that they have more to learn from their peers and from the Internet than they do from us. It's actually a generation that perceives more of a generation gap than any generation since the '60s, but it's primarily around technologies. So they're more likely to go to a peer for advice than they are to an adult. But at the same time, as you know, this is a generation that is hungry for more meaningful connections with caring adults. And I'm sure many of you provide that and you know that to be the key of your success as educators. This is a generation that wants coaching, wants mentoring, but will refuse to even engage with an adult who talks down to them or talks at them from the point of view of positional authority. They want to know that you care before they're going to start caring about what you know, as they say. Finally, it's a generation that really wants to make a difference. It's a generation that is far more motivated by making a difference than making money.

So what does all this mean for our work? Well, here's a college, very interesting, that's completely rethinking general education requirements. Here they are, here are the new general ed or distribution requirements of this college. And this college went a step further. They said, also we want the faculty to essentially give up lecturing so much and provide many more opportunities for dialogue in the classroom, as well as out of the classroom hands-on learning. What college is this? Anyone want to guess? Harvard. You just saw the new general education requirements that became policy a year and a half ago. Now I say this not to tout Harvard, that's not my point, but rather to challenge the notion of what does it mean to be college-ready in the 21st century? It is not studying bunches o'content. You look at this list and these -- it's a list of ways of thinking, ways of understanding the world, ways of framing the world. So our challenge, I believe, is to redefine rigor for the 21st century.

Today, rigor is based on the idea of an information-based learning system. The idea of timeless learning, focusing on the academic content that has persisted over time. And this learning system is organized in ways that we all kind of can recognize. Rigor is about memorizing more stuff, studying existing content within silos, by disciplines, learners working alone, usually in competition, motivated mainly by extrinsic rewards, and taught by content experts, and the assessment, of course, as we know. Now I believe content is important. Let me be very clear. This is not skills versus content.

You know, when Russia invaded Georgia a few years ago, I don't want kids worrying about South Carolina being next, which they did. So, content matters. But we are going to have to really think carefully about what content matters and focus on the content that matters most because the world doesn't care very much about what you know anymore. They care about what you can do with what you know. Because what you know is what everybody knows, it's right here, and it's changing constantly. Folks even in very technical professions will tell me that they're -- what they learned in school is obsolete 5 years out of school, completely obsolete. So there is a new skill. We have to think about less of an information-based learning system and more of a transformation-based learning system. It's what you can do with what you know. And this learning system is very different. It's focused on the skill of just-in-time learning, taking a brand new problem, brand new challenge, and working on it, usually in a team.

So rigor is figuring out the right question or problem to be working on. It's about exploring questions and possibilities across academic disciplines. You know, when I interviewed the head of talent for Google recently and asked her what was the one thing educators could do to better prepare young people to work in places like Google, she said, "Teach people to work inter-disciplinarily because problems can't be solved by academic discipline." It's also working in teams and it's motivated more intrinsically than extrinsically. Finally, taught by coaches, teachers who are content experts, but who also understand their role as coaches for a performance standard. And that's -- the strategy for assessment is also rich and varied.

So, at the heart of this, what we're talking about is teaching what Deborah Meier, Ted Sizer, and others call habits of mind. And I like this slide particularly. It's what Deborah Meier and her colleagues developed as a definition of habits of mind, which I think stands well also as a definition of critical thinking and rigor. Critical thinking is not just one skill, it's the ability to weigh evidence, to understand points of view, to think about connections, cause and effect, and so on. Fundamentally, it's about habits of question-asking, knowing how to routinely ask questions like, "What's the evidence for this? How persuasive is it? Whose point of view are we hearing? What other points of view might there be?" And so on. Going right back to what the executives told me about the importance of being able to ask the right questions.

So, briefly then, three challenges. I believe we have to fundamentally redefine organizational excellence by classroom, school, and district around three standards. First, accountability, holding ourselves accountable for what matters most. This is critical. How many of you right now know the real cohort high school graduation rate in your school or district? Raise your hands. I think I see three, four hands, certainly fewer than ten. The reason this is important is, as I suggested previously, for kids today, whether or not their school makes adequate yearly progress is irrelevant. They don't care. But what will matter to every single kid is whether or not they graduate from high school, career-, college-, and citizenship-ready. That's the accountability measure that I believe we must hold ourselves to.

Oh, and by the way, when we do that, when we really focus on teaching students conceptual understandings of content, teach students to use their minds well, communicate effectively, the test scores go up. Recent research points to the fact that a test-prep curriculum and just teaching to the test gets lower scores than a leaner, more conceptually rich curriculum that teaches students thinking skills. To track our cohort graduation rate and how well students do once they are in college using the National Student Clearinghouse, something almost no high school does, yet it's cheap, \$425 a high school. We have to use the college and work-readiness assessment, which is a real test of thinking skills, to assess students' abilities to reason, to analyze, to think critically, communicate effectively. I believe we should also be focused on understanding more clearly how our graduates do out there in the real world. We need to do focus groups with employers and college teachers and recent graduates themselves, and videotape those focus groups and bring them back to discuss what are the gaps and what are we going to do about them.

So that's what I mean by accountability in a new way. And I'm not saying AYP isn't important, and so on, but let's be clear. Five years from now, the accountability measures in this country are going to be very, very different. They're developing an entirely new generation of tests. Right now today, Cisco, Intel, and Microsoft are collaborating to develop online assessments of 21st century skills. So when those companies start doing that and when the consortium of states start developing new assessments, we're going to be held to a completely different standard. And beginning in 2012, the feds are going to be tracking high school graduation rates by the same standard, by the true cohort standard.

Academics. We have to do the new work of teaching the skills that matter most, to develop strategies for teaching and assessing what I call the three C's, critical and creative thinking, communication, and collaboration, in every single class and at every single grade level. I think we have to pilot these interdisciplinary courses around essential questions and we have to develop capstone projects for students so that students have to meet a standard for graduating from 12th grade. This is what Rhode Island is doing, by the way. Every student has to do a senior project to graduate from a public high school in Rhode Island. But then I think we need to backwards map that to eighth grade and fifth grade so we have a set of performance standards and capstone projects that tell us to what extent students have mastered the skills that matter most.

I think we also need laboratory schools in our larger districts, charter-like schools of choice where teachers, students, and parents can together consciously and intentionally develop these new ways of learning, teaching, and assessments. I believe every student should have a digital portfolio that follows the student over time. I don't know how many of you have done this with your special-ed students, or students with different needs, but it enables students to take a very different kind of pride in their work when they know four or five or six pieces of their work are going to be published every year and it's a cumulative record of their best work.

Finally, we have to do the new work in new ways. Colleague of mine once said, "Isolation is the enemy of improvement." No one teacher should have to figure out all by him or herself how to teach critical thinking, or is the students' writing up to the standard, the performance standard that matters. We have to work together. Every student needs an adult advocate, every teacher needs to be on a team for collaborative inquiry, looking at student and teacher work. We need to create transparency for learning and teaching. The flip camera, how many of you have seen the flip camera? Raise your hands. I believe that's the most disruptive technology that is least utilized in schools. We need to be routinely videotaping our own and one another's lessons, and doing -- using those to do what we call lesson-study. Let me be clear. I'm not talking about teacher evaluation. Evaluation systems are broken, they need fixing, and they will be fixed. But what I'm talking about is something completely separate, the idea of thinking about how do we continuously improve all of our lessons through collaborative inquiry. You know, evaluations are uncomfortable, they're about judgment, but lesson-study is about continuous improvement. Digital portfolios then, for teachers and for leaders, not just for students.

I'm going to not spend a lot of time on the policy implications because I think that you know from this what we have to do probably better than I. We need a different kind of accountability system,

and it's coming. It's more slowly than I think it should be, but it's coming. We need school-based R&D. You know, Microsoft spends 17% on research and development, Cisco Systems, 13%. Manufacturing company like 3M spends 6% on research and development to create entirely new products and services. What's your R&D budget? You don't have one. That's a trick question. How can we have innovation, how can we have improvements without R&D and without developing the R&D capability within our districts?

Finally, I believe we need performance standards as the guiding principle at every level in every education system, from kindergarten through graduate school, to certification and beyond.

Folks, that's my website, but I'm going to stop right now and I'm going to invite you to speak, at your tables, to take 5 minutes to react and reflect on this presentation. What did you agree, what did you disagree with, what questions emerge, and then we'll have some general kind of Q and A. Okay? So take about 5 minutes at your tables. [audience talking].

DR. TONY WAGNER: So, what -- we have some time for questions, conversation, unless you'd rather talk to each other. That would be fine. So I got -- I was asked a couple of questions as I was wandering the floor, listening in on your conversations. First question was the title of the Dan Pink book is, "A Whole New Mind," W-H-O-L-E. His new book is called "Drive," very interesting, but the one I referenced is "A Whole New Mind." And Deborah Meier's book that is, I think, so important for us to read is called "The Power of Their Ideas," meaning students' ideas.

And the website I put up for her, missionhillschool.org, is a K-8 school that is developing graduation requirements via portfolio and performance standards. It's a great site for downloading examples of portfolio-based assessment, the rubrics, and so on. Okay, so we have a gentleman here, Dennis, who has a mic, and if you raise your hand, he will come to you and we can have some conversation. I look forward to this because this is my chance to learn from you. Questions, comments, concerns, agreements, disagreements.

DENNIS: If they could come to the front, that'd be better for the video--

DR. TONY WAGNER: Or Dennis says you can come to him. [laughing]. Dennis, that immediately cuts the audience count down by three-quarters. So, one way or the other, the mic is here. If you want it to come to you, raise your hand, if you want to come to it, that's probably better. Now come on, I'm a teacher, I know all about wait time. I got a half-an-hour here, you know? Take your time, formulate your question. Hold the mic close to you so everybody can hear, please.

DENNIS: Well, I'll pull it from you.

WOMAN 1: Good morning.

DR. TONY WAGNER: Good morning. Close to you, please.

WOMAN 1: If you had only 12 to 18 months with a group of students and could not track them longitudinally, you only had that small group of time, adolescents, what one skill or two skills would you consider the most important to teach them before they left?

DR. TONY WAGNER: Critical thinking and communication, and it's a two-for-one because the only way you know students know how to think is through what they communicate, through their oral and written expression. But if I get a third, it would still be collaboration because I've found in my own work with students that they -- when they work collaboratively, that they actually generate a greater diversity of ideas, as well as a much more authentic audience for their work. So I really, deeply believe, and I -- you know, and this is not theoretical, I've done this with students, that we can over 18 months develop students' abilities to think more critically, to work more collaboratively, and to communicate more effectively. And if we succeed with those three skills, I think we will have well prepared our students for whatever they're going to be doing next, as well as to be good citizens. Thanks for your great question. More questions, more comments.

WOMAN 2: Everything I've ever heard or read on the concept of teaching critical skills has come back to that critical thinking is not a discreet skill that can be taught in isolation from content.

DR. TONY WAGNER: I agree.

WOMAN 2: So if we take a spin-off from that, what content area -- you know, like, we're not talking about critical thinking in one content area, nor does it generalize necessarily. I certainly would not pretend to be a critical thinker in medicine, for example. You know --

DR. TONY WAGNER: Well, again --

WOMAN 2: I wouldn't be able to be innovative or thoughtful or analyze or synthesize or anything.

DR. TONY WAGNER: Again, I could not agree more. You cannot teach critical thinking without content. And it's not content versus skills. So from my point of view, we didn't get into the question of how we teach critical thinking, that wasn't the question. But I deeply believe we have to engage students in rich and challenging content, but around questions, less around facts. So, all right, we're going to teach the Civil War, fine, well, and good. What was the name of Lee's horse? I don't remember. You know, when did the Battle of Gettysburg take place? I can google that. You want to have a race to see who can name the 50 state capitals more quickly, me on Google, or you from factual recall? So I'm going to teach the Civil War, but I'm going to maybe put up an essential question.

By the way, I'm not a history teacher. But I might do something like this. I might say, "What would happen if the South had won the Civil War? What would happen if the North had let the South secede? In what ways is the Civil War still being fought today? At the end of four weeks, I'm going to invite you students to write an essay on one of these three questions, or make up one of your own. Oh, and by the way, we're not just going to look at history. We're going to read literature. We'll read 'Red

Badge of Courage.' We'll listen to some of the music of the era, we'll look at some of the art and early photographs of the era." So, in other words, it's not just content versus skill. It's how we think about the content, how we incorporate the content, how we make it come alive for our students, that matters. That's what's going to teach critical thinking. Oh, and by the way, I would respectfully disagree with you about the medicine example. All of us are going to be consumers of medicine. All of us need to know how to ask tough questions of our providers. All of us as citizens need to be able to ask important questions about the essential issues of our era. And that comes through regular practice of question-asking, and by example. More questions, please. Is somebody with -- oh, yeah, Dennis. Then there's a hand here too, Dennis.

WOMAN 3: Okay, I just have a quick question. If we are teaching to these new skills, the thinking, the critical thinking, et cetera, and -- I guess how and when or will our accountability to the state change? Because right now that's not what we seem to be accountable for.

DR. TONY WAGNER: You're absolutely right and I think it's going to change within 5 to 7 years. Right now, I think 44 states are participating in consortia to develop next-generation tests and assessments. And as I mentioned, this is also happening internationally, the PISA tests, and so on. But I don't think we can or should wait, and that's really the point. I promise you that if we start really engaging students with rich, challenging, and interesting content, and teach them to ask great questions and to think about evidence and about cause-and-effect and possibility and perspective and so on, if we do that as a matter of habit, every day in every class, we will do okay with current accountability measures. Now there's still a problem because they're incenting the wrong kind of teaching.

Too many people believe, you know, we have to teach to the test. But, in fact, we will better prepare students by giving them a conceptual -- here's the problem. When we teach to the test, it's like giving kids a box of Christmas tree ornaments and no tree to hang them on. We're giving them bunches o'facts, right, with no conceptual understanding. Whereas if you go deeply and develop a conceptual understanding of an era, a discipline, whatever, students may not know all the facts, but they know enough to be able to eliminate at least two of the four multiple-choice answers because they know how to think, they know how to read critically. So they will invariably out-perform students who simply have memorized facts and then forgotten them the minute they've memorized them.

WOMAN 4: My question is about the School of the Future. Have you heard about that curriculum? Because everything that I have heard so far is very much, you know, aligned to the soft skills of collaboration and the critical thinking through really using and analyzing information. And how familiar are you with that --

DR. TONY WAGNER: That's the one in Philadelphia that was sponsored by Microsoft, right?

WOMAN 4: Yeah, that was the one. But also, what I would like you to really look is at that, you know, from the perspective of the philosophical piece, not just --

DR. TONY WAGNER: What's exciting today, right now, is that I can take you to hundreds of schools around the country, if not thousands, that have been intentionally developed in recent years to teach these skills. When I gave that list -- where's my clicker? Put a slide back. When I gave you the list of the new education system -- let's see if I can get it back quickly. I'm sorry I'm a little slow here, but -- this one. This is not hypothetical. I profile three schools in the last chapter of my recent book, "The Global Achievement Gap," which are organized by these principles. The School of the Future is organized by those principles. High-tech High, New-tech High, there are hundreds of schools. And apropos the whole question of accountability, the governor of Indiana was so taken by one of these school models, New-tech High, he's trying to put one in every single district in the entire state of Indiana. And it's -- so it's that bottom-up effort by you, edupreneurs, if you'll pardon my phrase. I know that's a little hard to translate in sign language. Edupreneur is an educational entrepreneur. It's the edupreneurs in our world who are creating these schools as existence proofs, as models of the schools of the future today, not tomorrow. Thank you for your question.

MAN 1: Good morning. Like most public school employees in Pennsylvania, I belong to a teachers union. What do you see as the role of unions in the transformation process?

DR. TONY WAGNER: All right, how many of you have seen "Waiting for Superman"? Raise your hands. How many who intend to see it, raise your hands. I don't see enough hands. Everybody needs to see that movie because it's a movie that defines the education problem for the public, for parents, for policy-makers in ways that I find very disturbing. I'll get around to answering your question. But "Waiting for Superman" does a brilliant job of portraying kind of the aspirations of under-served students and their parents, brilliant job at that, and creates urgency around that. But lays the blame for our under-performance very squarely on teachers unions and says the answer is charter schools. Now I'm -- I was an NEA building rep. I think there's a role and a place for unions. I do not, however, think there's a role and a place anymore for tenure. I simply don't see it.

I quit a tenure -- I've quite two tenure-track jobs, one tenure job. I had a tenure job as a high school teacher, I quit it. I was tenure-track in the university, I quit it. All of the incentives to become tenured at the university level I think are wrong. I deeply believe we're going to have to get into the practice of thinking critically about our work, and some of the best union leaders understand that. They understand that we have to reinvent our profession. Finland, that highest performing country in the world by any education standard, and far more heterogeneous than those people realize, with 45 languages spoken in Helsinki schools, Finland has one of the strongest teacher unions in the world, and yet is the highest performing education system in the world. Also has a shorter school day, students do less homework, they start school at the age of seven.

By the way, I mention Finland because I was invited there this spring and I'm collaborating with Robert Compton, who made the video "Two Million Minutes" on a documentary, a full-length documentary, about the Finnish education system that'll be released next month. There'll be information on my website about that. So I don't think it's unions per se. We have good unions, we have

bad unions. It is how we think about our profession and our professional associations, and what we ask them to advocate for, that matters. Thank you. More questions, comments.

WOMAN 5: Hi, thank you for your presentation. I am a parent of a child with Asperger's Syndrome and so your analysis, or the seven survival skills that included critical thinking and problem solving, as well as curiosity and imagination, those being including in that list is exciting for me because my child is a problem-solver. He has high math and science skills, very high, and also has a tremendous ability to draw and have imagination. So, I guess my question for you, though, is this. In the team, or team-building type thing, the element of coaching and all that sort of arena in the public school system, it's really hard to build a team that works with a child with autism, with the -- I'm choosing my words very carefully because I know there's a lot of educators in here. [audience laughing].

DR. TONY WAGNER: You're a parent, you're an educator too.

WOMAN 5: I know, I know, but I don't want to --

DR. TONY WAGNER: I understand. You're among friends. You can just say it.

WOMAN 5: Okay. With the lack of education of the educational system about children with autism at this point, the fact that these kids are so thinking-oriented, okay, but in an arena that's so different than a lot of the other kids that they work with on a regular basis, their thinking level is just so different, yet so precious because they are the inventors of so many of these great gadgets that everybody's walking around with. They are the inventors of a lot of the processes that change the way we live. And there's so much evidence, research-based evidence that says that, okay? But yet, as a parent, I go in and speak to that and they look at me as though I'm insane.

So what is your evidence to a parent like myself and to the educators that are sitting here on how do we address those issues for those kids because none of this really speaks to that? You want to say, okay, get these kids some, you know, great oral communications. That may never happen for a kid with autism. All this sounds great until you throw in that special-needs child.

DR. TONY WAGNER: Right, I understand, yeah. I think we have to embrace the idea of every student having differences. Every student is different. Every student has his or her own uniqueness. And I think the education system historically has been a kind of conveyor belt and an assembly line that tries to diminish or eliminate differences, and create a standardized product. And I think that it does enormous harm to most students. Some manage to slough it off and get by. Many do not.

Have any of you seen the movie, the recent movie, "The King's Speech"? Raise your hands. It's a fascinating story about difference and it's a wonderful story about a teacher, not certified, not an expert, an unconventional, highly innovative teacher who helps this would-be king overcome a speech impediment and embrace his difference. So I think, ultimately, the challenge for all of us as educators, and I realize there's huge constraints in terms of time, most of all, but ultimately I deeply believe,

especially with students who are in some ways challenged behaviorally or whatever, helping them find their uniqueness, helping them find what they're good at, helping them find and develop and discover their passion is our most important job. Because if they're able to develop their passion with awareness, awareness that they also have weaknesses that they need to be constantly working on, put the two together, embrace and develop your passion, your special interest on the one hand, and on the other hand be self-reflective and know that you have things you're going to have to get better at and work on, that's the greatest gift I believe we can give any of our students. Other questions or comments. Yeah.

WOMAN 6: I'm currently attending a graduate program to retain my Master's and one of the gripes, I should say, of a lot of the instructors are the undergrads want to know every single detail of an assignment. They want to know --

DR. TONY WAGNER: What do they have to do to get an A? Just tell me what I do to get an A. I don't want to learn, I just want to get an A.

WOMAN 6: And at the graduate level they're like, we just -- go find an article, write about it, review it, and do it on your own. They're not giving you an amount, they're not giving anything. So I think one of the things to think about is not think of this as a transformational, we're going to go from here to there. Do it just in small steps. Ask them, you know, once a month, once a week even, write about something that you're interested in just so they get that critical thinking. They can still memorize, you know, parts of what they need to memorize, but also just get that idea of thinking. And from our local schools, I know the senior projects, they give them a list, okay, here's the -- and it's ridiculous, like they should be able to come up with something that they want to do instead of this is something they have to do and these are the guidelines, these are the requirements. And also, you know, go back to teaching ethics because that's what I'm learning now as a graduate, going, this is ridiculous, we should have had the ethics back in kindergarten.

DR. TONY WAGNER: Well said. I agree on every count, absolutely. The best schools that I've seen have a culminating project as a part of every single class. So, at the end of every semester and every class, students have to do something with the content they've been learning in some kind of project or performance. And if they get in the habit of doing that, then when they get to a senior project, they're going to -- you know, you have to get out of their way. They're going to be so excited to have opportunities to do things. So thank you. I couldn't agree with you more. Time for a couple more questions if my voice holds up. Yeah.

WOMAN 7: First of all, thank you for your words. I look forward to not only seeing some drastic changes in K-12, but to see them at the college level would be wonderful as well.

DR. TONY WAGNER: It's a K-16 problem. I couldn't agree more.

WOMAN 7: But my question is, I think that sometimes it's easier to create that sense of urgency for change in districts where there are a large number of students who are not being served well. Do you

have any suggestions for those school districts who are, by the standardized test scores, doing very well, where really there's a tremendous resistance to change by pretty much all of the players in the system, including parents and students.

DR. TONY WAGNER: Yeah, if it ain't broke, don't fix it, you know. You know, it's actually quite interesting. I'm seeing a growing interest on the part of some of the highest performing districts to reassess and reevaluate because many of their parents understand that it's not just about getting into a name-brand college anymore. It's about having skills. A lot of them begin -- I don't mean to be touting my book, but a lot of them -- parent groups or community groups. One district bought 5,000 copies of my book and put it in every library and started a community read. So I see a lot of interest in that.

Fundamentally, though, what -- a strategy that I believe can really accelerate that is to go out and do focus groups with recent graduates from those districts, students who are two to four years out, not first-year graduates because they'll all tell you how wonderful you are, but ones who've been out in the world a little bit, and ask them in what ways they were most well-prepared, what ways they were least well-prepared, what their advice would be for teachers and parents, and videotape those focus groups and bring them back. Bringing the student voice into the conversation, from my point of view, is one of the single most important strategies we can use to create urgency.

And on my website there's actually an example of a focus group like that that I videotaped for a school district. And I find consistently, when adults hear kids talk about all of the ways in which they were bored in school, unengaged even though they got A's, even though they got into a good school, how they were fundamentally, at best, unengaged, and at worst, ignored, it begins to create a very different conversation. I saw a hand back here, yeah. Excuse me.

MAN 2: Good morning and thank you for your presentation. From your experience, looking at the international educational systems and knowing that in America we educate all children, you know, from a young age, how do you reconcile the approaches or the accomplishments in American schools, where we educate all, to overseas schools, where there are different tracking levels and, you know, and different traditions that are set up there? And I was just wondering how your seven skills for survival in the 21st century, you know, is that based on the business world's interests and the higher education's expectations, or is that something that you got from overseas, or just a collection of?

DR. TONY WAGNER: Two great questions, second question first. What I found was an extraordinary level of consensus that I did not expect among leaders, business, community, academic, military leaders, about the skills that matter most. They emerged from a wide range of interviews over a period of a year and a half. And interviews I've done for this new book, and as well as speaking engagements, have only confirmed those findings. What I hear over and over again is, you nailed it, you got it right, in terms of the seven skills. So it emerged from leadership interviews, and then in talking with audiences like this, a strong degrees of agreement. So I didn't go into my research thinking, "Oh, well, there's a bunch of skills and I'll just get people to confirm that." They emerged completely and organically out of the interview process, and then confirmed by a lot of the literature as well.

To your first question, you know, what's fascinating about Finland, when they began the transformation of their education system 40 years ago, they were an under-performing system and they had an economy based on one product, chopping down trees, which they figured was kind of a dead end. And they knew that they were going to have to transform their education system to create a vibrant 21st century economy and society. The first thing they did was create a comprehensive education system for every student and eliminate tracking. You see, we say we educate every kid, but we educate every kid in different tracks. And that's not the same. Finland eliminated tracking, has no tracking. But having said that, kids have a choice. When they get to upper-secondary, they can either go to technical vocational high school or to more academic high school. Both lead to post-secondary, which is 100% paid for by the government. And kids cross over.

Frequently the programs are in the same schools and they cross over. So it is true that some places, you know, Singapore is not representative of all of China, nor is Hong Kong, nor is Macau. There are elite kids educated in elite ways. But there are examples of countries that are really educating every single student. Finland will be 20% immigrant population in the next 8 to 10 years, already rapidly growing. And they're educating every single student to the same high standard because they know, as a small country, they cannot afford to leave a single child behind. They need every young person to be a vibrant, participating member of their society. Denmark, Sweden, the same, every kid to the same standard. Question here. One or two more questions, then we need to stop.

MAN 3: How do you see the transformational material that you've been presenting relate to the large numbers of students in our country that just have difficulty reading or are living -- or their group, their home group is not very interested in education, and within the context of the financial difficulties and time difficulties that almost all schools in this country face?

DR. TONY WAGNER: Yeah. This gets back to fundamentally issues of race and class. There was a wonderful, provocative article that was the cover article of the New York Sunday Times Magazine about 2 ½ years ago on what is the best research that we have about the achievement gap. And one of the stunning pieces of data that came out was that the vocabulary of kids from under-served populations, how many words they've heard by the age of five versus middle class populations, directly related to literacy. Also the motivational and the punitive language versus encouraging language, and so on. What we know is that every single student can perform at high levels and become literate, but that some students will need more time and more resources. The schools that succeed with under-served students, disadvantaged students, have a longer school day and a longer school year.

How many of you have read "The Outliers" by Gladwell? Raise your hands He's cites fascinating research that shows that the major factor in the achievement gap is what happens to kids over the summer. Kids from disadvantaged communities are set back months because of what does not happen for them and with them over the summer. Kids from middle class communities are accelerated because of all their summer enrichment stuff. So we're going to have to find ways to ensure that all students receive the kinds of additional time and supports they need to be able to achieve at high levels. The KIPP schools of the world have figured that out. They know how to do that. Last question. We done?

All right, let me conclude. How many of you remember -- I can't resist, being a high school English teacher. How many of you remember the opening to "Tale of Two Cities"? Raise your hands. Yeah, well, that's maybe the only thing you remember from high school English. [audience laughing]. It was the best of times, it was the worst of times. I mention this because, from my perspective, we have both in education today. These are very critically challenging times. You know this far better than I. Populations with more needs and we have fewer resources and less time. I know that. These are very challenging times. But it is also, interestingly, from my perspective, the best of times. I have opportunities to go all over the country and meet extraordinary educators like yourselves who are deeply committed to reinventing American education classroom by classroom. So I simply want to end by thanking you for the incredibly important work you do for young people every single day. Thank you. [audience applauding].