

SCHOOLS THAT MAKE SENSE --Video

Narrative Summary

(This text is excerpted from the video and is not a word-for-word translation.)

How can we fix what we don't understand?

Wouldn't it be nice if we could stop the world long enough to make sense of what's happening all around us? We feel powerless when we're bombarded by sudden events and uncomfortable information that we can do little about. We're faced with pressures to compete with the rest of the world ...And with changes in our own families and communities...

Our generation therefore finds itself faced with a complex challenge. How can you fix what you don't understand? . . . especially when you don't seem to have much time to do it. We have no choice but to deal with change at the same time as we try to understand it..... and learning from experience -- that's a new kind of problem!

And for those who work in or with schools, they face the additional challenge of equipping a new generation with the knowledge and skills necessary to deal with these constantly changing conditions.

We've been trying hard, but seem to be losing ground

Over the past several decades, American education has responded to this challenge by developing new materials, providing technology, sending staff to new kinds of training, leading and managing schools differently.... "fixing," looking at and attempting to improve each of the various parts that make up our educational system. It made sense to do that ...and still does. Yet with all this redesign, realignment, and "restructuring" . . . and with the difficult conditions that continue to exist around us . . . are we really comfortable with how far America's schools have come in these tasks?

No one will deny that schools have had successes. In fact, surveys continually show that most Americans think their local schools are doing a good job. Still, many feel that we must do better...that some children are not receiving an adequate education ...that many aspects still could be improved and that with more complex problems seemingly occurring more frequently, part-by-part improvement isn't getting us where we want to be fast enough.

So frustration mounts. Even though we focus national attention, resources, and research on schools, we still have not been able to put these parts together in a way that permanently and effectively changes education as a whole.

How can it be that a country as powerful and resourceful as ours... a country that created from scratch an organization that could put men on the moon... can't reorganize one of its most basic and familiar institutions?

It just doesn't make sense!

With all the national concern for improving our schools today, it doesn't make sense that all these efforts by dedicated people are not having the overall effects that we need. Why is that?

Each idea seems to make sense...to some extent. Schools need more money. National standards would clarify directions. Better tests would provide information to help schools improve. Teachers, like any professionals, always need more training to stay up to date. And students need to know how to use the modern technologies that are already in wide use throughout society.

Yet the problem seems to be outside any of those individual solutions.

Fix the parts; or fix the system?

Colorado's Governor Roy Romer may have expressed this frustration at part-by-part improvement best when he noted -- "If you've got a guy who's got a bad heart, and bad kidneys, and bad lungs, what are you going to do -- cure him one piece at a time?"

What the Governor notes is that, at least in matters of health, when we deal with individual problems we never forget that they are part of a system of connected parts. . . . and interestingly, the same approach seems to apply to the "health" of organizations. In industry, for example, they've discovered what some call the "85-15 Rule" --

- 85% of problems are due to poor systems.
- 15% of problems are due to poor individual performance.
- Put good people in a system where the parts are poorly connected, and the system will win most of the time.

Industry has recognized that the fundamental parts of an organization --its people --aren't the problem. They function, as do the parts of a body, as an interdependent system. But, what's the *system* in schools? Where is it? Clearly, America's educational reformers would want to fix the whole "system" instead of the individual parts? Why aren't they doing it?

And there's the beginning of the real problem. To fix an entire system, we first have to make sense of it. If something "makes sense," we know why it acts as it does.

That's what this tape is about -- first, we'll find a way to *make sense* of the system we call schools. . . and then, we'll use what we learn to suggest ways we can begin today to *improve* them.

Making Sense

There is a fundamental reason why schools have to make sense to us our minds require it. Our brain has been compared to a "sense-making" machine... it attempts to create order out of what we experience every moment of our lives. We can't even stop the process . . . we sense something, and jump to a conclusion about what it is, or what it means. We may or may not be right, but we have to have an initial answer to the question "WHY?" [Did you ever wonder why pre-schoolers are always asking "why?" and not what or how?]

Knowing *how* is important, but without knowing *why*, we can never improve... we must have a reference point for understanding -- something that makes sense, an answer to that question --"why?"

To make sense of today's problems, we usually try to make connections between what we observe, and what we already know. We look for connections . . how do things fit together?

And what happens when we have to deal with conditions we don't totally understand? . . .when we can't see either the connections or understand the big picture ?

You watch and watch and watch until you begin to see patterns. And when actions seem to fit those patterns, you'd begin to think of these patterns as the rules of the "game." These rules become a theory of what the game is all about ... a framework that helps you know enough about the game that you can tell when it's being played right or wrong, and what might improve it, and then you can even predict what might happen next.

So these are ways we "make sense." But what happens when we can't "connect-the-parts"... or make out the "big picture" -- when the parts are so numerous or separated that we can't observe enough to develop a theory? ...just like the situations we face today in schools. There are too many exceptions to the old theories and rules...we have too little experience with big pictures that might encompass and help us make sense of all the parts.

Well today, maybe a question for those of us trying to make sense of schools might be ..." Did anything like this ever happen before?. ...if we haven't had the experience, has anyone else?"

Another time, another place...same problem!

In the 16th century, beliefs based upon centuries of direct observations held that the earth was the center of the universe. But a Polish astronomer, Copernicus, challenged that basic belief.

He questioned a theoretical system that had been in place for some 16 centuries ...and it had worked pretty well. Farmers could plant and harvest, and sailors could navigate. Each day, people could go on with their lives, and what they saw with their own eyes was what the theories predicted. The sun, stars and planets moved around the earth.

In fact, they could even predict the position of the stars and the planets from season to season. Of course, there was some problem in predicting the length of the seasons, but astronomers could correct any discrepancies by adjusting something else in the system. Unfortunately, discrepancies corrected in one place usually produced a discrepancy in another. As a result, Egyptians had added over 5 days to their year; and by Julius Caesar's time the Spring equinox had slipped 10 days.

In fact, the system had become so cumbersome to work with that Copernicus complained...

...“it is as though an artist were to gather the hands, feet, head and other members for his images from diverse models, each part excellently drawn, but not related to a single body, and since they in no way match each other, the result would be a monster rather than a man.”

Now, Copernicus didn't know exactly why things weren't working, but he did feel that there was something amiss in the way the whole system was arranged. What some saw as adapting the system, he saw as patching and stretching it to cover what didn't make sense.

In seeking to understand, ...much as we do today, ...mankind had created a theory from what it had directly observed, without realizing that it never really saw the *system* the theory predicted, and which they drew abstractly on their charts.

Copernicus set out to find a different theory. He sought a system that would allow more sensible explanations of how planets moved and seasons occurred. . . one that would allow the more exact predictions needed by explorers were beginning to cross oceans.

At that point, Copernicus must have felt as we do today when we look at what's happening in our schools. We, too, are trying to make sense of our system of schools --seeking out its natural processes and rules -- so we can use that understanding to improve them. But many times when we think we fix one part of schools, another problem appears somewhere else and we end up patching and stretching to make things fit.

It's frustrating . . . for everyone -- inside and outside schools. And with frustration can come blame, for someone must be doing something wrong! We say, "If they won't do it right, we'll find someone who will."

And in the midst of all this , life in schools still has to go on. Teachers, administrators and policy makers must try as hard as they can each day to meet the needs of today's children while at the same time trying to change schools for the children of tomorrow.

But where's the new blueprint that could help us all make sense of how the whole school system is supposed to work? Just having good "parts" isn't enough. Connecting relationships are just as important. Yet, in schools, we see teachers, principals, other administrators who work isolated from each other and from those from whom they need support. Somehow, without effective connections, the different and changing needs that students bring to school with them each day are supposed to be known by people outside the classroom who might be able to help. And curriculum and new ideas mandated or developed out there... are supposed to miraculously appear ready for use in all classrooms.

So, to develop a new blueprint that can help us make sense of schools, maybe we, like Copernicus, should be asking some different questions:

- Are things really connected the way we think they are?
- Is our fundamental theory right about how the parts connect to our purpose?
- Do we all have the same purpose?

Reframing Schools

Before we try to challenge any beliefs ... maybe we should go back and look a little more closely at what Copernicus did ... and what happened when he did it.

Copernicus, being human and needing to “make sense” of his findings, kept asking “*why?*” Was there a different way to look at reality that would allow it to make more sense?

His calculations indicated that the earth was only a small part of a larger system -- a universe with the earth in company of other planets all revolving around the sun. Today we'd say that when Copernicus re-framed his view of reality, he changed his “mental model” or shifted his “paradigm.” Its important to note here what shifting a paradigm really involved. It made complete sense to most people that stars, moon and the sun moved around the earth because they saw it happen. And there's nothing wrong with theories based on what we see until we stop questioning them and they turn into *beliefs*. Then they can become frames - or boundaries - that limit our ability for seeing anything outside them.

This is a key element of a “paradigm” or “mental model.” It is a way of seeing and understanding the world around us . . derived from one fundamental central belief. And once we have them, we seldom have to think about them again.

Isn't it the same situation today with schools? We each make sense of them based on theories developed from our own experiences . . as students . . as parents . . or even as teachers . . or administrators. And we continue to peer through those paradigms every time we think about schools.

Lessons from Copernicus

Copernicus' problem, therefore, was similar to ours in that he could see the “parts” of the solar system, but he couldn't “see” what was happening in the spaces between them. He was able to figure out what those invisible connections might be however, because of one critical characteristic of relationships among parts of a system . . the parts each have a common relationship to something else... some common element. For Copernicus that element was the sun.

He then went beyond direct observation, to actual [mathematical] proof. That the sun was the center of our solar system, became scientific fact for him. Once he accepted the sun as the center of the universe, he could relate everything he observed to it.Suddenly, the behavior and the relationships of the planets became clearer.... they “fit,” ...with this paradigm he could provide a new map that *made sense*.

Are there lessons for schools today in this 16th century story? Are there natural working parts to our school universe that may not need to be changed as much as re-connected? . . More important, does our system have a common center which if we could understand, and accept, would make these connections clear?

Understanding the purpose...the fundamental reason an organizational system exists ...is the key to understanding *why* things are supposed to be connected in it.

Finding the center

So, what about the organizational “systems” we call schools? What is the purpose that connects everyone in them? We hear many answers today. But, woven throughout each of these is a common element -- learning. Schools are about learning.

So for re-mapping our schools . . . is learning our “sun”? If so, then why does it appear as if all the parts of this education universe don’t seem to relate to learning? Why don’t all the parts that make up that universe -- students, teachers, schools, administrators -- why don’t they seem to connect and function together as they work each day to promote learning?

Could it be because it’s so hard to “see” learning? When you look in a classroom, how can you tell which students are really learning and which aren’t? Is “activity” learning? Is “thinking” learning?

Because we can’t observe learning happening, we have indicators like tests that suggest learning may have taken place. But test results are not learning. Test results can’t be the focal point for a system, any more than thermometer readings could provide the criteria for organizing a hospital.

But we can’t see learning. We see instead the things we provide to promote learning. We have national debates over what should be learned; how to teach it so it will be learned, and what type of school systems will best support that teaching but that one thing still remains unclear -- what is learning?. . . how does learning -- the goal of all our efforts -- take place?

There are two ways we can find answers to those questions: 1- We can observe, like the pre-Copernicans; or 2- like Copernicus, we can experiment and conduct research that provides a sound base of fact.

Let’s try the first way: assume we don’t have a common theory and we have to figure out what the rules and theory of learning are just by watching what happens, time after time after time?

First, we might conclude that learning has something to do with the taking in of information and knowledge. If so, it would make sense then to conclude that teaching was the delivery or transmission of that knowledge, that effective knowledge delivery causes learning, and if it is delivered well, learning happens.

With time we might even develop a *Dump Truck* theory of learning. Knowledge, appreciation and abilities are loaded into the teacher’s “dump truck” and then directly unloaded into the student’s mind... so he or she can build a productive life with the pieces. With this theory we would then organize our schools to support the teacher as “information-dumper.”

So, we would conclude from this observation-based theory that the fundamental purpose around which we organize schools is to deliver knowledge. If we are to accept that information-dumping theory -- if we let that be the belief that frames the way we look at schools -- then the test should be that it works in all learning situations . . . but it doesn’t.

Just like Copernicus, we observe things that don’t “fit” the theory. For example, what about all the learning we do before we ever get to school -- learning one or possibly two complex languages, learning how to walk and navigate. Where was the dump-truck? And what about all the learning we do outside of school... on-the-job... or in the home?

So lets try the other approach -- research. Where Copernicus turned to mathematics, we turn to basic psychological research. to look for something more fundamental as the center of our understanding.

In the past several years, an entirely new field of research has disclosed a lot more about learning . . . especially where and how it takes place . . . here in the *mind*. From this research has grown an entirely new area of study -- cognitive science -- the study of the mind -- how we perceive, remember, learn, plan and reason.

The implications of these new, and continuing, discoveries about learning are as profound for education as Copernicus’ mathematical proofs were for astronomy. In fact, its been called a revolution . . . a cognitive revolution. While we are only at its beginning, this revolution already has uncovered some important facts about the learning process... facts that explain why so many of our good intentions in schools seldom produce the results we want.

Learning...No Choice!

Copernicus' experience suggests why this research is so important. Since "learning" is as central to our school systems, as the "sun" was to Copernicus' view of the solar system, we must first understand, and accept as a fact, the basic and natural way that all human minds learn - children and adults. Then, we must use this shared understanding of learning as a common reference point as we take a fresh look at each of the educational system's "parts."

How does this fundamental "center point of our system"-- this learning process -- seem to work? Since the brain is an integral part of the human body, we would expect it to share certain characteristics with other of our body's sub-systems. For example, each major system takes in something from outside, processes it, and turns it into something the body needs to function properly and survive -- the lungs take in air; we call it breathing, and that process produces oxygen cells need for growth. Our intestines process food and other nutrients --we call that digesting, and the process produces elements the cells need.

We also know that from birth on, these critical life systems don't change the ways they function, but they can and do increase their capacity to function more effectively. And the mind is no different.

What does the mind take in and process from the external world? Information . We call that process learning, and the process produces the skills and knowledge a person needs for survival and growth.

So learning is an essential process in every human being. At the same fundamental level as breathing and digesting. There's no difference. Each process is part of the basic programming of every normal child and adult.

When you say that you believe that "every child can *learn*," that isn't an expression of a *possibility*. Its a fact.

So this is where we must start our understanding of learning. We don't have to make anyone learn . . any more than breathe or eat. Everyone has a built-in capacity to learn . . and just as with the other body systems, we can help increase the mind's capacity so it can function more effectively.

Those of us who aren't scientists frequently use metaphors to help understand how body systems work. Did you ever compare the heart to a pump, or the eye to a camera? What do you picture when you think of the "mind?"

Some people envision the mind as just a library - a storehouse for remembering as much as possible - the bigger your library the more intelligent you are. Still others think of it as a computer. In fact, cognitive research suggests that the mind is very much like a computer--an actual *information-processing* device that is "wired" to use effectively what it chooses to store.

But, of course, the test of a metaphor is whether it is useful to you in understanding something you don't understand. Let's introduce three different symbols-- 1] *Robinson Crusoe*, 2] a *radar*, and 3] a *weaver*.

First, "Robinson Crusoe". -- He was shipwrecked on an island with no help from the outside world. Clearly this challenged everything he knew. First he tried to use prior knowledge to make sense of a new situation. Then he had to apply what he knew to the situation and if it didn't work try again -- try, fail, learn from it and try again. What was happening? That's where our radar metaphor comes in. Out there in the external world there are a lot of things which, if we learned them, could help us live effectively. . . but there's not room for all of them in here. So, as sense-makers, we continually scan this world of information with a kind of internal, hidden radar -- trying to understand what we encounter there and figure out what it means.

But our radar probes are not random sweeps. Think about what our "radar" looks for right after we do something: "did it work? accomplish our purpose?" or we look for evidence that we make a difference -- that we have an impact on the world. We notice the unexpected, or the missing piece to a problem, that provides an *ah-ha* -- the joy when suddenly something makes sense. Most of all, our radar seeks reflections of who we *are*.

Do you notice that these signals bouncing back to us from these active probes into the world around us provide a very special and powerful kind of information? When you compare this feedback with all the other data coming at you, what is different about this *new* information?

In a way, you “own” it! Its been generated as a consequence of your actions. You’ve acted - based on what you know - and this feedback tells you something new about the validity of what you *know*, and also about *you*. Do you see why we pay more attention to this information?

For our radar scanning analogy then, let’s consider that there are just two types of information out there waiting to be taken in . . . this powerful information that is “yours” and “everything else..” Again , your information is that which bounces back as a consequence of something that you do... as you directly interact with the outer world. It has a unique power to influence your learning. In fact, research indicates that the more the interaction, the greater the learning.

And second - "everything else" is just what it says - "everything else." -- It includes fundamental information about the world that we use as the building blocks of knowledge. This information comprises much of the content of instruction -- and also can be powerful information -- but first it has to be taken in. And there's the problem...it has to fit... it can't just be dumped there! Why? There's not enough room. The mind has limited space, and the new information has to fit with everything else that's in there now.

So this brings us to the third metaphor, lets now think about the mind as a *weaver* ...a spinner of information into strands, and a connector of strands into concepts and patterns. This weaver's responsibility is to make the most of the limited space in here by recording and managing the information we take in so that it can be easily retrieved and used.

So as new information comes in, the weaver seeks connections to what's already stored there. Here isolated facts may be linked together - in terms of some relatedness - as *concepts*. Animals have certain features, for example...all animals can breathe. Also, in here, the concept of “animal” is linked to other concepts, such as Bird and Mammal, which themselves have features connected to them.

Now suddenly, my radar picks up new information. What is it?...a Duck Billed Platypus. I can see the Platypus has fur just like a dog. I can also see that it has a duck bill and webbed feet just like a duck. So, I have learned that not all animals with duck bills and webbed feet are ducks ... and not all animals with fur are dogs. So we see the mind doesn’t just store what it takes in, it can also create new knowledge from it -- and if we use that knowledge successfully, even *wisdom*.

But what would have happened if my original connection became so established and strong that they had become rules? All animals with webbed feet and duck bills are ducks. When we turn the connections we see into rules, theories, or beliefs they became like windows that lead us to see only what we believe and believe what we see. Remember, it was this type of rigid beliefs window that kept people from accepting Copernican theory for so long.

So, the radar and weaver processes help the mind get and store information effectively, as well as construct new knowledge. For most of us, Platypuses exist more as information than knowledge. What would turn this information into real useful knowledge? Let my “head” represent what I “know” at any one point in time . . . Here’s all that previously stored information --facts, objects, events, etc. -- all woven together in these pre-existing webs. And here also are my *skills* in using this information; along with *rules* I’ve developed about how to act on that information stored here. Now, if at some other point I am knowledgeable about Platypuses, and more expert in what I can do with the information you might say I’ve *learned* something. So something important had to happen between here . . . and here.

What happens in this space that makes our knowledge and expertise change over time? What happens in this space that increases our capacity to act differently next time? What makes us learn?

The answer brings us back to our first metaphor -- “Robinson Crusoe”. -- Do you remember what Robinson Crusoe faced? -- A challenge to what he knew. When we face challenges, our minds do their most important work.. They must draw on prior knowledge and if it doesn’t make sense, or work, they have to adapt and create new knowledge. They must learn. Learning is an increased capacity to handle future challenges -- much as exercises provides challenges that increase the capacities of our circulatory and respiratory system.

Challenges to what we know offer the experiences that feed back that vital new information from which new knowledge is woven. Overcoming challenges moves us on this journey towards mastery and expertise --and increased capacity. We start from this initial state of partial understanding and sense making . . . and move to the next level of partial understanding. The places “in-between” these two states are challenging experiences that provide useful feedback ... and a chance to try again . . . so that each time we are a little bit more knowledgeable or expert than the time before.

Challenge, interaction, and a chance to try again ...does this make sense? To test this, think about the learning we do outside of school -- first, during the first five years of life, and then later as an adult. During our first five years we develop the capacities to walk and talk - to do a lot of important things... all without formal instruction.

As children, it was that natural urge to make sense of the world that took over and compelled us to learn to walk and talk. One thing that helped us was that as we attempted new tasks we received immediate and unambiguous feedback.

Watch a child learning to walk. If he can't keep his balance he falls down. If he doesn't like falling down, then he has to maintain his balance -- he has to try to walk again. His environment provides information to let him know how well he's doing. He gets the same type of feedback as he attempts to communicate. He points to things, but does not always get exactly what he wants. As he learns the names of objects and says them, he finds people respond more quickly and accurately to his needs.

So, in an environment that provides challenges, feedback and a chance to try again, a child can test new ideas, skills and capacities to find if they really work, then continue to practice them until mastered.

It works the same way throughout the rest of our life. Most of what we learn as adults may not have been formally taught, ...but learned through the challenges of on-the-job experience. Here too, our learning -- the increase in our mental capacities -- results from feedback and chances to try again.

So, if learning -- central purpose of schools -- is at the center of our paradigm, or way-of-thinking about schools, what is this new science of the mind -- cognitive science -- telling us about it.?

- We can see that *learning is a natural process* regardless of age -- it's part of the way our body works. It's the way we make sense of the world in which we must survive. *Everyone can learn . . . and in fact, does learn.*
- What drives the learning process? *Challenges* to what we know.
- What feeds it? *Information generated from the ways the world interacts with us*, and especially the feedback from what we do.
- What does it produce? Our woven-in capacities -- like intellectual muscles; *capacities to act.*

Looking at the system through a learning-centered frame

With learning at the center of our system, we once more face a Copernicus-like dilemma. We have scientifically verifiable facts that can't be seen, and in fact, contradict what we do see-- that's why we have to use metaphors. Let's use them again to re-examine the *dump-truck* theory we developed from what we see happening in schools? What's different? What's missing?

First, in many schools, there may be no time to use that powerful body of new information generated from practice and feedback. information that can allow a student to self-correct, and which provides clues for what to do next.

Second, notice who is doing most of the work? There's little weaving for the *student* to do because the teacher has the major responsibilities ... but with a handicap. From the outside, the teacher lacks the weaver's intimate knowledge of what's already stored in the mind, also hidden are how it's all woven together, and what rules the

student may have developed for using it. Can you see why it can be so difficult for teachers to play this connecting role?

And, there's something else going on today that affects this... there's not much for the weaver to do at home either! The media have extended our radar scanning...exposing us to endless amounts of information - (often more than we may want)...but the media are horrible "weavers." Very little is connected. Moreover, little of it provides feedback. In fact, recent medical research show that it takes less energy for a child to watch TV than to do nothing. Why? Because when we do nothing, our mind still remains active.

And finally, where are the challenges . . . those situations that would drive learning from the inside...where students would feel satisfied because they accomplished something important, had tested themselves, and seen that they made a difference . . . where are these challenges ?

Since the mind must have these challenges . . where are children finding the substitutes? Where do they find challenges to what they know and can do? ...Challenges that let them learn from trial and error interaction; and that allow them to get better continuously?

If schools aren't providing meaningful challenges that engage the mind, can you see connections to the ways children behave while they are at school? To their seeming lack of motivation? To their dropping out at alarming rates?

Can you see now how cognitive science helps us understand why we're having some of the problems we are? This type of research will continue to provide more insight on how to organize schools and instruction to support effective learning. But in the meantime, what do we do about these problems?

Fortunately, the same research provides keys to help us make sense of, and find ways to attack today's educational crises. But now the issue is not children's learning . . . but ours! And the challenge that must drive our learning is right here . . .

On one hand, cognitive research for the first time helps us understand how learning takes place in all children. With that we can see exciting new implications for what the adults in school might do every day to accelerate learning among these children.

But on the other hand, we have, in our own minds, a mental map of the "educational universe" that for many generations -- just as in pre-Copernican times -- made sense . . . and seemed to work okay. When we went to school, we didn't know this isn't the way learning and teaching is supposed to be. We had to make sense of this world we observed...even if it didn't fit our natural way of learning.

We made it "fit" by developing beliefs that explained it. And in our minds a lot of us still carry around these pictures of this educational world that are as firmly entrenched as pre-Copernican maps.

Can schools learn?

This then is the challenge. How do schools, as organizations, learn how to move from where they are to achieve what we now know is possible? Now if a school were person, we would ask "Can he or she learn?" We would ask . . . how can this mind move from today's partial understanding towards new levels of knowledge and expertise that represent a new overall capacity? A capacity to respond to the learning -- to the sense-making -- needs of children?

But a school isn't a person, it can't learn. Only the people who work in it can. So, what do we now know about the human mind that might make it possible for those who already work in our schools to learn how to do business differently?

Well, for one, we know that research and logic aren't enough. If that were all it takes to create a major paradigm shift, it wouldn't have taken 200 years for Copernican ideas to gain total acceptance. And one problem, as

we've seen, is that our deeply-held beliefs about learning and teaching don't go away easily. Especially when we have little experience to really convince everyone that there is a better way to operate.

Maybe the answer can be found in what we already know about learning to overcome challenges. Schools already have the challenges...every day. But what is missing are opportunities to address them in an environment that allows people to make sense of the problems they face; that provides immediate and unambiguous feedback... opportunities to test new ideas; and opportunities to develop new skills and knowledge through actual practice.

What would it take to operate schools this way. . .to operate your schools this way?

Three essential elements:

1. This new approach to developing children's learning would have to *make sense* to those who work in schools, and to those who support them.

Well, we already know that these basic concepts are supported by sound present day research, but we also know that they have made sense for two or three thousand years. People have always believed that "experience is the best teacher." And good teachers already know how much more effective they are when they have the time to interact with students as they learn.

2. We would have to believe it was *possible*. No one wants to risk a child's mind and future on untested approaches. Are these ideas and approaches untested? No. Today there are schools throughout the country applying the knowledge gained from this research. They're beginning to provide children with opportunities that can support their continuous growth and improvement -- opportunities that allow them to make sense of their worlds, learn from them, and develop the capacities to master them.

But as we know from other good educational ideas that have been effective in isolated demonstrations, that doesn't prove they can be universally applied to all situations. Where are there models that embrace complete organizations - whole systems?

Fortunately, they exist. Many of these ideas can be found working well in a wide variety of organizations that today we call *World Class*. Common to each of these organizations is the ability to learn from the challenges confronting them. These *World Class* organizations are private and public sector work settings restructured around a very different fundamental belief. Listen to US Secretary of Labor Robert Reich . . . "*Your most precious possession is not your financial assets . . . your most precious possession is the people you have working there . . . and what they carry around in their heads . . . and their ability to work together.*"

The new workplace -- the human mind! To tap that resource, these work settings are structured and managed so that everyone can learn from their work how best to improve it.

What makes this possible in these successful *World Class* settings is that they parallel the regular work processes with a managed learning process that takes advantage of those natural ways that minds learn. For example, the "weaver" capabilities of all staff are continually tapped to make sense of the problems they face as work groups review, think and plan together. Each member brings his or her own unique knowledge, skills and experience to bear on those immediate problems. They interact as they construct new solutions which, in turn, increase their personal and organizational capacities.

Each person's "radar" needs are met by ensuring ongoing feedback about results. When this feedback goes to those who can act on it right away, assessment becomes a way to ensure success, not just measure it.

And what about the challenge? What do we find in these world class settings that meets the need for everyone in the organization to be addressing the same challenge? I like the way the staff in of these work settings described that challenge -- "*Both we,and the results of our work . . . must get a little bit better each day.*"

These *World Class* organizations prove that effective improvements and change can develop out of work, not on top of it.. These World Class organizations have learned that it is possible to address system-wide challenges... in ways that allow the entire organization to learn and change for the better. All they do is tap into, and support, the

natural ways people learn. Then they align and support their staff's natural drive to overcome challenges and solve problems.

What they do seems simple. Out of a single process they make it possible to have continuous improvement -- both of results and the capacities to produce them.

So these ideas make sense; and are not only possible . . . but are practical and effective. They could provide a challenge for our schools and all the people in them . . . to get a little bit better each day . . . but that still will not be enough.

3. The third requirement is *commitment* -- total commitment. We -- those who work within schools, and those who support them from outside-- will be asked to totally re-think things we haven't been thinking about . . . to change things that may have been successful for us in the past. Why would we do that? What could drive us to endure that sort of mental struggle almost every time we make what used to be routine decisions?

Two reasons! a common goal . . . and a strong enough belief that we have no other choice.

Interestingly, the first is already there. Everyone wants schools to positively affect children's learning. And the daily work . . . if not life work ... of America's teachers and administrators . . . is already committed to that end -- to personally make a significant difference in the lives of children.

So we already have a common purpose to orient us, ...but what do I mean . . . "a belief that we have no other choice?"

Think back for a minute to two earlier analogies. Remember what happened in the 200 years after Copernicus. Since most people's lives were not really affected by the arrangement of the universe, they still had a choice of what to believe. And it's easier not to have to change . . . especially when the old ideas seem to make so much sense. The only ones who had to make a choice about the center point of the solar system were those whose daily work was affected - astronomers, explorers, and the church.

But what about today? It probably still doesn't matter which concept of the solar system you subscribe to . . . unless your work, like NASA's, involves getting to the planets. In the same way, if the effectiveness of today's schools has no influence on your life, then - like the post-Copernican's -- it really doesn't matter...you still have a choice. You can keep doing what's comfortable even though it doesn't work for some ... and someday -- after we're gone -- someone will work it all out.

But if the effectiveness of our schools does affect your life, do you really have any choice but to start with the correct centerpoint for thinking about our systems of schools the individual mind - and its natural way of functioning? Do you and I really have a choice to go on acting as if this natural process of learning could be violated without putting the child at risk? ...and today putting each of us at risk?

Remember when we noted that all people breathe, digest, and learn . . . and each process has a fundamental way of working that doesn't change. Well those who treat the *physical* processes that support life really have no choice - they must start with a belief and understanding of these fundamental ways the circulatory, or respiratory or digestive systems work. For example, our circulatory system may differ in effectiveness, but the way they each operate is the same. This is the bottom line. To deny it . . . for example, to make the blood go in the veins or out the arteries, puts a person at great risk, and can only be done for short periods of time. Physicians have no choice but to start with that understanding...every day.

So do we really have a choice to go on acting as if children's learning was only a possibility --- that their minds functioned as empty vessels to be filled by our dump-trucks?

Instead of "All children can learn" maybe we should have this bumper sticker --

All Children DO Learn No choice!

This is the bottom-line decision for each of us . . . the first step to making sense of schools. Like the post-Copernicans, once we accept the individual mind and its natural way of functioning as the new centerpoint for our systems of schools. . .then we can have a more accurate way of comprehending the “universe” that surrounds the mind.

And on this new map or blueprint we can begin to sketch in new teaching practices that make more sense for schools. We can begin to look “outward” to envision more effective relationships and roles that take advantage of the natural energies and forces in this universe. And we can begin to remove the barriers that have prevented it from working the way it is supposed to.

So today we have an idea that *makes sense*,... knowledge that it is *possible*,... and a personal *belief-based commitment* to a central goal. These three requirements create a powerful force, one that can overcome the struggles of changing accustomed perceptions and practices.

These are the requirements for starting. The elements are within schools to accept this challenge. The primary human resources are in place for creating the changes required.

Change can happen if we can manage schools so that educators once more become learners. Change can happen if we can take advantage of the power of their minds [and our minds] to learn, to overcome old paradigms and construct new practices out of experience.

With these changes we can accelerate the large-scale improvements required for today’s schools. The learning challenge that you and I face today is to make these improvements "the way we do business" in all schools.

If all this makes sense - if we now see "why" we must do this - then do we have any choice but to accept the challenge...Do we have any choice... but to learn!

END

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