Beyond TTWWADI

Reconsidering Education in the Information & Communications Age

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Overview:

Beyond TTWWADI (That's the Way We've Always Done It)

It's amazing how we can embrace doing things the way they have always been done without examining where the original decisions came from. We just accept a pre-existing mind-set because it's the path of least resistance. For example, the mind-set for the structure of our schools is based on decisions that were made in the days of the horse, buggy, kerosene lamp, factory floor, and production line. It's a system in which most students are still released for 3 months each summer so that they can harvest the crops based on some European agricultural cycle. This is classic TTWWADI (That's The Way We've Always Done It). Accepting this preexisting mind-set of what schools look like is easy because they haven't changed that much in a long time. Most educators embrace the entrenched ideas about schools and learning without thinking. However, the world is no longer the stable and predictable place it once was. Technology is fueling an engine of change that is making the world a moving target. What is startling is that the rate of change is picking up speed with each passing day. Radical new developments in technology are having increasingly profound implications for life as we know it. In this environment of change, it is critical that we begin to question the rationale behind TTWWADI in our schools.

This presentation looks at the development of our current mind-set for what schools look like. We trace the source of many of the foundational assumptions we take for granted in public education. We then look at some of the key areas of technological

development that are putting pressure on schools to change and explore the implications these developments have for what new skills and habits-of-mind we should be emphasizing in our schools to prepare students for life in the 21st century. We will examine the power of TTWWADI and discuss the difficulties we face in shifting people's ideas to a new vision for schools and learning. Finally, we will suggest a number of ways educators must change in order to keep up with a world on the move, a world that is forcing us to face a fundamental question about the nature of education: Do we prepare them for the world of tomorrow, or the farms and factories of yesterday?

A preamble about monkeys

Start with a cage containing five monkeys. Inside the cage, hang a banana on a string and place a set of stairs under it. Before long, a monkey will go to the stairs and start to climb towards the bananas. As soon as he touches the stairs, spray all the monkeys with cold water. After a while, another monkey makes an attempt with the same result – again all the monkeys are sprayed with cold water. This continues until pretty soon whenever another monkey tries to climb the stairs all the other monkeys will try to prevent it. Now put away the cold water. Remove one of the monkeys from the cage and replace it with a new one. The new monkey will see the banana will attempt to climb the stairs. To his surprise and horror all the of the other monkeys attack him. After another attempt, and attack, he knows that if he climbs the stairs he will be assaulted.

Next remove another of the original five monkeys and replace it with new one. The newcomer takes part in the punishment with enthusiasm! Like wise replace third original monkey with a new one, then a fourth and a fifth. Every time a new monkey takes to the stairs it is attacked. The monkeys that are beating him have no idea why they were not

permitted to climb the stairs or why they are participating in the beating of the newest monkey.

After replacing all the original monkeys none of the remaining monkeys have ever been sprayed with cold water. Nevertheless no monkey ever again approaches the stairs to try for the bananas. Why not? Because as far as they know that's the way we've always done it around here. We call this TTWWADI.

Why do we do the things we do the way we do?
It's because of TTWWADI - That's The Way We've Always Done It.

It amazing how we can embrace doing things the way they have always been done. It seems that once a decision has been made for a course of action, it is much easier to just continue going in the same direction than it is to reexamine the situation and re-evaluate the decision. With all of the effort required to think your way through an issue, it is all too easy to just slip into a preexisting mind set. Often we have no idea where the mindset came from or how the original decision was made. We just accept things as they are because it is the path of least resistance. Here's an example of what we are talking about.

The mindset of the rails
Today in the United States, the spacing between the rails on railroad tracks is always 4 feet, 8 1/2 inches - a rather odd and seemingly arbitrary number.

Why is that particular spacing always used?
Because that's the rail spacing they used to build the railroads in England, and English expatriates built the US railroads.

Why did the English use that particular spacing?
Because the same people who built horse-drawn wagons in the pre-railroad era, and that's the axle width wagon makers built the first railroad cars used.

Why did the wagon makers use that particular axle width?
They did this because, if they used any other axle spacing, the wagon wheels would break on the sides of the established wheel ruts.

So, where did those old rutted roads come from?
The first long distance roads in Britain and Europe were built by Imperial Rome for the use of the Roman military, and they have been in use ever since.

Why did the Romans use that particular axle spacing?
Roman war chariots formed the initial ruts in these first roads, and everyone ever since has had to adapt to those ruts to avoid destroying their wheels. Thus the United States standard railroad track spacing of 4 feet, 8 1/2 inches derives from the original specification for an Imperial Roman war chariot.

What this all means
Specifications, bureaucracies, institutions, and systems have a natural tendency to solidify in their ways, requiring people to do things the same way they have traditionally been done. This, despite the fact the world is changing around us all the time. In this situation, you might find yourself sometimes asking, "What horse's ass came up with this way of doing things?" In the case of the railways, you would be closer to the truth than you imagined, because the Imperial Roman war chariots were made just wide enough to accommodate two horses asses.

Indeed, a horse's ass did originally determine the way we do some things now, and we finally have the answer to the original question. That's TTWWADI!

And there's more

There's new twist to the story about railroad track spacing and horses' behinds. When we see a space shuttle sitting on its launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These are solid rocket boosters, or SRBs, which are made at the ATK Thiokol Propulsion factory in Utah. The engineers who designed the SRBs might have preferred to make them a bit fatter, but the SRBs have to be shipped by train from the factory in Utah to the launch site in Florida. The railroad line from the factory runs through various tunnels in the mountains. The tunnels are slightly wider than the railroad track, and the railroad track is about as wide as two horses' behinds.

So, a major design feature of what is arguably the world's most advanced transportation system was determined over 2000 years ago by the width of a horse's ass! That's TTWWAI. And it's everywhere.

For example why do we have 24 hours in a day, 60 minutes in an hour, 60 seconds in a minute - 360 degrees in a circle and 60 minutes in a degree? why isn't it 10 hours, 100 minutes, 1000 seconds, 100 degrees in a circle.

It was decided 4400 years ago because the Sumerian math system couldn't handle fractions and 60 could be divided by 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 so they could avoid using fractions

Then about 3500 years ago the ancient Egyptians divided the day into 24 hours.

About 2,200 years ago the Babylonians divided the hour into 60 minutes and the minute into 60 seconds.

This system is still in use today.

So instead of a 10-10-10 time system and a 100-10-10 circle system, we use a 24-60-60 time system and a 360-60-60 circle system.

That's… TTWWADI!

TTWWADI and the mindset of schools

Let's use this point to reexamine the assumptions behind our modern education system. Today's public education system was created over a century ago in a time before computers, before television, before airplanes, before automobiles, before radios, before telephones, before satellites, before computers, before brain research and entirely before electricity was available in anyone's home.

In fact, today's public education system was designed in an era when more than 90% of young people still lived on farms or in rural areas. Consequently, education was institutionalized and legalized as a seasonal enterprise. Schools adopted the six-hour day and the nine-month calendar to accommodate farm life. Summers were reserved for harvesting crops and other agricultural activities. Schools were designed to serve the needs of a slower-paced, far less technological world - an era called the Agricultural Age.

Then, at the end of the 19th century, the Agricultural Age began to give way to a new way of thinking as the Industrial Age swept across America. Quickly this became a time when the modern assembly line factory was viewed as the most advanced form of organizational productivity possible. The factory model was appealing because of its

tight organization, its uniformity of product, and its standardization of process.

Not surprisingly, schools were modeled after the assembly line factories of the early 20th century, with teachers seen as the workers, students as the products they produced and schools as the production line. Schools tried to make students regimented "learning machines" so that they would be equipped to play efficient roles on the assembly lines of the day, doing precisely defined tasks over and over accurately as rapidly as possible.

Schools needed to look just like the factory

Both factories and schools strove for standardized procedures, mass production, technical efficiency, and an assembly line process that required all work to proceed at a uniform pace. Remarkably, the thinking of the day in large part remains with us. Today we have an educational model that can produce students with the same efficiency and consistency as Henry Ford was producing Model T's.

However, the world that today's high school seniors face is profoundly different from the world in which this education model was created, and it continues to change even more every day. Students are growing up in the Communication Age where information is available anytime and almost anywhere.

Access to information on everything from world events to the latest research in any area of human endeavor is available from your desktop or the palm of your hand. While easy access to enormous amounts of information holds profound implications for students, workers and citizens alike, the impact of the technological revolution doesn't stop with improvements in communication.

Development of even more powerful technologies will bring about enormous changes to our lives in the very near future. Biotechnology -

the marriage of electronics and biology - is just beginning to hit its stride. Technological innovation is surging ahead in such far-fetched fields as genomics, nanotechnology and, above all, bio-informatics.

Still more phenomenal changes will come with the development of nanotechnology. Nanotechnology will allow us to build incredibly small materials and machines out of individual atoms and molecules. New neuro-silicate implant technologies that allow the blind to see and the deaf to hear are already significantly affecting the fields of health and medicine. In addition, this is just the beginning.

In the very near future, nanotechnology holds the promise of allowing us to do things such as bloodless microsurgery, RAM upgrades for the human mind, rebuilding nervous systems devastated by disease, allow people with spinal injuries to walk again and to reverse-engineer dozens of human processes gone bad. Sadly very little of the astounding scientific discoveries of the past 30 years is reflected in the modern curriculum. Nor is much of the latest research on the function of the brain and how it influences learning as is reflected by today's instructional practices.

Such breakthroughs hold far-reaching implications for the way we will learn and the way we will experience life in the 21st century, not to mention the skills, knowledge and habits-of-mind that will be needed to operate in a very different environment from the world of Ford's assembly line.

Preparing students for such a world is what our schools should be about. Yet, today's students continue to attend schools whose form and function were established in the days of the horse, buggy, kerosene lamp, factory floor, and production line. A system in which most students are still released for 3 months each summer so that they can harvest the crops based on some European agricultural cycle.

This is classic TTWWADI. Accepting the pre-existing mindset of what schools have always looked like is simply the path of least resistance. It will require much more effort to reexamine our school system and reevaluate how they should be structured. However, with the radical changes occurring in the world today, it is critical that we begin to question the rationale behind TTWWADI in our schools. The future success of our children is at stake.

Why does education continue to struggle dealing with change?
Why do we continue to struggle when the world outside of education continues to change at an exponential rate?

Over the course of the past twenty five years, education and educators have been asked/told to change almost everything about how they teach, how they test, and even how they conceive education – in fact, everything they have come to believe in about education since the time we were young.

In doing so, they are not being asked to change a few small behaviors, the way you might try to save money or lose weight or stop smoking. They are being asked to change the most fundamental parts of themselves – their core, unconscious assumed habits and values about education

How hard is it to break a bad habit?
Let's start by considering one habit you'd like to break or a behavior you'd like to change. Can't think of any? Just ask your spouse, who most certainly has a long list.

Try something simple - stop smoking, putting the toilet seat down, not saying "ya' know" all the time, spending less, losing a little weight… wow, it's really hard to break a bad habit. It's really hard to change.

So when we ask educators and policy makers to change how they think about education, we are not just asking them to change a few behaviors. What we are asking them to do is to change the most fundamental parts of themselves and belief systems.

Essentially what we are telling educators who have developed habits of mind for years to "Do everything different!" at the same time that the people who hire them, the parents who attend parent-teacher conferences, and the politicians who write laws don't really want there to be any change from the way things were. That's the power of TTWWADI!!

So the fundamental question schools now face is this: For what world should today's schools be designed to prepare our students? The Agricultural Age and Industrial Age? Or the Communication Age, the Biotechnology Age and the Nanotechnology Age? Do we prepare them for the world of tomorrow, or the farms and factories of yesterday?

What's the definition of insanity?
The definition of insanity is doing the same thing you've always done, but expecting or wanting or needing completely different results. And if we continue to do what we've always done, we'll continue to get what we've always got. And in doing so, we will fail ourselves by failing our children.

Demonstrating TTWWADI (An idea sent to us by Mark Tompkins)
One activity that I have used over the years in workshops you might find interesting to demonstrate TTWWADI. Identify an "airport" on the screen or use a box or trash basket. Ask the participants to make a paper airplane that they will attempt to fly and land at the "airport. When everyone is done making the airplane, have them all throw their designs at the same time. Typically very few paper airplanes will land

close to the “airport” - typically 1 out of 100.

Ask the participants to make another paper airplane, this time improving the design and performance. While they’re making their second airplane, pick up many of the first round planes and put them on a table to display.

When they’re finished, have them all fly together again. Often times, the second round of flights is worse than the first because they modify the existing design by adding more elements to the plane.

Collect the second planes and put on another nearby table.

Now it's time to talk. We look at the first planes - everyone is different (paper, size, folds etc...) yet they all are based on the same paradigm on how to build planes...and they don't fly well. It's just the way we do it.

I make the point that teachers are required to do more and more these days, that curriculum is piling on but the planes design does not change...we just add more to it.

Then I go to the second table to look at the new improved planes...they look interchangeable with the first planes...just more added on and often fly worse.

The key moment occurs when I talk about the flawed paradigm we use to design our planes. Then I take a plane, crumple it into a ball and throw it. This crumpled ball is inevitably a farther flying, more accurate plane then the complex ones they made.

The point: sometimes as educators "unlearning" is more important than doing more to or for students. We need to keep it simple and focus on

what really counts. How students learn, not how we teach or administrate. This simple illustration/game has been done with audiences in excess of 300 and always works. It makes the point of TTWWADI and paradigm shift better then just talking about it because participants live it.

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