

Changes needed in US Education:

Area	Problems	Options
<p>Learning</p> <p><i>Need to disrupt our methods and content</i></p>	<p>When politicians, administrators, or even parents believe that succeeding at our current education (i.e., memorizing the multiplication tables, mastering the long division algorithm, being good at paper-book reading, and studying science, history, and civics in traditional ways) is what is important for today's and tomorrow's students, they put those students at a huge disadvantage relative to the fast-changing future.</p> <p>We need to provide an education that interests our students and gets them deeply engaged in their own learning, and that teaches all of our students what they need to be successful in their 21st-century lives.</p>	
<p>Assessments</p> <p><i>Present assessments are used badly because they serve only to rank, and do not provide useful feedback to students and teachers to help them improve.</i></p>	<p>The educational medicine most prescribed today – the test-scores-driven, fix of Arne Duncan, Michelle Rhee, and others – will not result in our kids getting the right education, even if it reaches whatever goals they set, because it treats the wrong disease.</p> <p><i>Students need to be part of the assessment process and help develop how they will get feedback</i></p> <p><i>Like playing a video game, children respond to moving to the next level when they accomplish their task</i></p>	<p>The much-banded-about, high-stakes assessments of today are poorly designed, used badly, often measure not what kids know, but rather their test-taking abilities. They are poorly designed, despite their claimed statistical sophistication, because they measure things no longer valuable, do not measure many increasingly valuable skills at all, and rely overly on a discredited approach to assessment (i.e., multiple choice questioning).</p>
<p>What and How we teach</p>	<p>Rather than start over with new schools, a far better, more effective approach is to change what goes on in our current classrooms. To change, that is, both how we teach and what we teach, in ways that reflect our current and future realities. Changing the “how” means creating a pedagogy that works for today's students. Changing the “what” means creating a curriculum that is future-oriented and engaging to today's students, while remaining useful and rigorous.</p> <p>How to Teach – Changing Our Pedagogy to “Partnering”</p>	
<p>Partnering with our students</p>	<p>“Partnering” is a catchall term for approaches that include problem-based learning, case-based learning, inquiry-based learning, student-centered learning, and others which have until now been seen as “different.” At their core, they are all variations on the same central pedagogical idea, generally accepted by experts: an end to teaching by “telling,” and a reassignment of roles for the teacher and students.</p>	

	<p>We need to move from the teacher talking and the students taking notes. (“My teachers just talk and talk and talk” is by far the students. biggest complaint about school.) In partnering, the students do what they do – or can do – best, which is finding information, using technology and other resources, and creating. The teachers do what they do best, which is asking the right questions, ensuring quality and rigor, vetting, and adding context and appropriate scaffolding.</p>	
<p>What to teach</p> <ul style="list-style-type: none"> •Modeling •Scaffolding •Coaching •Reflecting (Meta-cognition) •Fading 	<p>Our curricula are already overstuffed, the new curriculum must begin with deletion – figuring out and eliminating those things that are no longer truly needed, yet take up tremendous amounts of class time. Since every piece of our current curriculum has its backers and artisans, it is crucial that everyone be made to understand these need to delete, or we will never make progress. To those who maintain that students should take years of 1,000-year-old geometry because it helps their logical thinking, we must respond: “So does programming, and it will help them get jobs.”</p>	<p>Deletion candidates in elementary school, for example, include cursive handwriting, the long-division algorithm, and – very controversially – memorization of the multiplication tables. Deletion candidates in higher grades include much (though certainly not all) of some traditional mathematics courses and many details of history (not the broad strokes, of course).</p>
<p>Curriculum</p>	<p>Presently we teach in a silo process of just the individual discipline. This generally creates a lack of interest and little engagement.</p>	<p>Create an interdisciplinary learning environment that begins with stories from literature, social studies or a science. Blend in the learning of math, science and language arts.</p>
<p>Creating an educational plan for the individual</p>	<p>Problem: educators need to understand where the student is coming from, what they think and why; what they understand.</p> <p>How can they do this efficiently while managing a classroom full of students? What are the areas that need to be understood to understand the students needs:</p> <ul style="list-style-type: none"> • Background understanding and pre-conceived thoughts • Their skills and characteristics • Their passions and wants • The environment that they are in • What structure support system do they have; community 	
<p>Knowing our students</p>	<p>Our current education places no importance on even knowing the individual passions, or interests, of our students, and most teachers don.t ask – not necessarily because they don’t care, but because they</p>	<p>What’s their learning style, Do they bring pre-conceived thoughts to the classroom? Everything we teach should also be matched with a clear answer to the student’s constant question of “Why am I learning this?” Students should be taught to</p>

Area Problem Options

<p>Current U.S. education ignores almost entirely the thing that has always been America's greatest strength: the passion of our people.</p>	<p>are so occupied with all the other required tasks (such as teaching for the tests) that they feel they have no time. But if we lack the time to find out who our students really are and what they like, it is hard to create an education that interests them.</p>	<p>immediately use what they learn to effect outcomes in the world, and change it for the better. For example, they can use their learning to design a school of the future, or to redesign their current school. They can use the languages they learn to work directly with foreign students. They can learn to perform professional energy and environmental audits of local businesses. They can use their knowledge and skills to create Public Service Announcements for local TV and radio stations.</p>																		
<p>Learning Styles Relate to Multiple Intelligences</p>	<table border="1"> <tr><td>Intrapersonal</td></tr> <tr><td>Logical-Math.</td></tr> <tr><td>Spatial</td></tr> <tr><td>Bodily-kinesthetic</td></tr> <tr><td><i>Musical</i></td></tr> <tr><td><i>Verbal-linguistic</i></td></tr> <tr><td><i>Interpersonal</i></td></tr> <tr><td><i>Naturalist</i></td></tr> <tr><td> </td></tr> </table>	Intrapersonal	Logical-Math.	Spatial	Bodily-kinesthetic	<i>Musical</i>	<i>Verbal-linguistic</i>	<i>Interpersonal</i>	<i>Naturalist</i>		<table border="1"> <tr><td>SelfSmart</td></tr> <tr><td>LogicalSmart</td></tr> <tr><td>ImageSmart</td></tr> <tr><td>BodySmart</td></tr> <tr><td><i>SoundSmart</i></td></tr> <tr><td><i>WordSmart</i></td></tr> <tr><td><i>PeopleSmart</i></td></tr> <tr><td><i>NatureSmart</i></td></tr> <tr><td> </td></tr> </table>	SelfSmart	LogicalSmart	ImageSmart	BodySmart	<i>SoundSmart</i>	<i>WordSmart</i>	<i>PeopleSmart</i>	<i>NatureSmart</i>	
Intrapersonal																				
Logical-Math.																				
Spatial																				
Bodily-kinesthetic																				
<i>Musical</i>																				
<i>Verbal-linguistic</i>																				
<i>Interpersonal</i>																				
<i>Naturalist</i>																				
SelfSmart																				
LogicalSmart																				
ImageSmart																				
BodySmart																				
<i>SoundSmart</i>																				
<i>WordSmart</i>																				
<i>PeopleSmart</i>																				
<i>NatureSmart</i>																				
<p>Professional development <i>Focus on the core essence of learning, not just the content.</i></p>	<p>We need to refocus our teacher training around more effective pedagogy, rather than just around particular technology tools. In a “verbs vs. nouns” metaphor that many find useful, the “verbs” are the unchanging skills of education, such as thinking critically, communicating effectively, presenting logically, and calculating correctly. The “nouns” are the tools of education – the technologies that students use to learn and practice the skills. In the 21st century, nouns change with increasing rapidity. For example, for learning the underlying skills (verbs) of presenting, communication, and getting information, nouns (tools) currently used include PowerPoint, email, and Wikipedia. But while the verbs will not change over the course of a student’s education, the nouns certainly will. Our pedagogy needs to focus on the underlying verbs, while providing students with, and employing, the best, most up-to-date nouns (tools) to do so –many of which are becoming so inexpensive that they can be supplied to all students at the beginning of each year in most places. Some of the verbs students need to master are unique to our changing times. Skills like programming digital machines, video communication, statistics, and problem solving should be studied by all our students starting in kindergarten,</p>																			

Education's future changes needed in US education-07252012

Area	Problem	Options
------	---------	---------

	as we weed out as quickly as possible those skills that are no longer needed – particularly ones that machines can do faster and better.	
Steps to make changes	Despite all the focus that reformers place on testing, our hardest and most pressing educational problem is not raising test scores, but rather connecting our kids' education to real life and to the fast-evolving world of the future. It is our inability to make the material we are currently required to teach in school real and interesting for today's students – call it relevance, or engagement, or something else – that makes so many current efforts unsuccessful. And our teachers know it.	We must, first and fundamentally, re-design education to be connected to students. “reality” – the world they see and know. While students have always asked “ Why should I learn this? ” the answer, for most things, is now less and less clear. The real reason kids have to learn most of what they are taught today is “because it's in the curriculum,” not because it will be useful long-term. (This could be easily verified by having adults take the SATs and making their scores public.)
3 C's The new curriculum should be much more <i>cross-disciplinary and integrated</i> than is currently the case, because this is how the world works.	To those who argue that patience and delayed gratification are important, I answer yes, but only if students are convinced their efforts will truly pay off in ways that are important to them. It is therefore crucial that we create a curriculum that is focused almost exclusively on future reality , and on connections to today's and tomorrow's world, while respecting the past.	Additionally, it needs to focus much of its teaching on at least three areas that are not given enough – or often any – systematic attention in our current education. Let's call them the “3 C.s”: 1. Character and Passion 2. Communication & Problem Solving 3. Creation and Skills. In the new curriculum, all subjects would be taught in the context of these 3 C.s, rather than just being grafted onto an existing content base.
Character and Passion <ul style="list-style-type: none"> • <i>Empathy</i> • <i>Ethics</i> • <i>Values</i> Habits of mind...	In the current system – or at least the public portion, which is most of it – there is an almost total lack of curricular emphasis on character, i.e., becoming a good person in addition to a good student. Teachers may work on this, but it is not “in the curriculum,” except in the earliest grades. When our current education was conceived, such character education was mostly left to the home and family, a context that no longer exists sufficiently	Systematically focusing on character and passion will correct one of our current education's greatest failings: focusing more on content and subjects than on the people being educated. The formal part of our education has also almost totally excluded our students' passions. Some of these passions get to be expressed in

Education's future changes needed in US education-07252012

Area	Problem	Options
------	---------	---------

<p>Art Costa</p> <p>Children need to feel successful and do it with community</p>	<p>(or in some cases not at all) for many of our students. We need to find ways of making character a cornerstone of our education, while still maintaining the secular values that characterize public education. Here is one place we can look to some of our private and charter-school successes for guidance.</p>	<p>extracurricular activities, but students will do far better if their personal passions can be more integrated into our teaching. Students often complain that too many of their teachers don't know them as individuals. At the least, all our teachers should know what their students' passions are and help those students approach their school subjects through the lens of those passions.</p>
<p>Communication and Problem Solving</p>	<p>Communication and problem solving are highly linked: Most 21st-century problem solving is done in groups, and even the best of solutions are worthless when not shared. Yet we currently do not approach either communication or problem solving systematically and holistically in all subjects.</p>	<p>IDEAL: I= Identify problems and opportunities D= Define goals E= Explore possible strategies A= Anticipate outcomes and Act L= Look back and Learn</p>
<p>Almost every problem in life can be helpfully viewed (and many solved) through the lens of a common framework, a framework that we should teach to all students, from kindergarten to college. This "Five Skills Framework for Problem Solving" can be seen in detail at www.marcprensky.com/writing/framework. The Five Skills Framework, if applied to all subjects, would create thousands of new problem-solving and communication experiences over the course of an education, and become a useful tool in students' 21st-century lives.</p> <p>http://www.integratingengineering.org/workbook/Design%20process.htm</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Each skill is further broken down into supporting skills. For example, Figuring Out the Right Thing to Do includes Identifying Problems, Behaving Ethically, Thinking Critically, Making Good Decisions and Judgments, and Setting Goals.</p> </div>		<p>The five skills are:</p> <ul style="list-style-type: none"> ✓ Figuring Out the Right Thing to Do ✓ Getting It Done ✓ Working With Others ✓ Doing It Creatively ✓ Continually Doing It Better <p><i>The process of problem solving is iterative and meta-cognitive reflection occurs at each step.</i></p>
<p>Creation and Skills</p>	<p>Creativity, as several educational observers these days have noted, is often actively discouraged in our current education. Given the tools that our students have increasing access to – many right in their pockets – with enormous capabilities and power that were only dreamed about in the past, today;</p>	

Education's future changes needed in US education-07252012

Area	Problem	Options
------	---------	---------

	students ought to be the most creative in history. Our future curriculum and education should be about unleashing all our students' creativity with these tools, in every subject and in every area of student passion.						
<p>Interdisciplinary Learning</p> <ul style="list-style-type: none"> • Teams= 6 Hats • Habits of Mind • Bloom Taxonomy • Engineering Design Process • System Thinking • Simulation methods 	<p>An example of a program for PreK-5th grades introduces teachers to engineering design and thinking skills (tools for engineering) in an interdisciplinary project based learning environment. The program uses the engineering design process, as defined in the Massachusetts Science Framework, as a connector between students' literature/ social studies and their mathematics and science curricula. It infuses the development of thinking strategies with creative and critical thinking, provocative questions and meta-cognitive reflection, skills that are part of the engineering process. This approach is based on the definition, "Engineering is about designing useful products & processes for society using all disciplines, but mainly science & mathematics". Teachers can use the design process to engage their students while dialoguing about literature.</p> <p>For example, kindergarteners might respond to a common fairy tale by designing a house for one of the little pigs (or perhaps a means of blowing down a house for the wolf!); fifth graders might respond to the book Island of the Blue Dolphins by identifying needs and solutions for Karana, the marooned main character of the novel.</p>						
<p>Delivery</p>	<p>How to provide the best education and engagement for the students?</p> <table border="1"> <tbody> <tr> <td>• Blended learning</td> </tr> <tr> <td>• Flip instruction</td> </tr> <tr> <td>• Clickers... Audience response systems</td> </tr> <tr> <td>• Team learning</td> </tr> <tr> <td>• Interdisciplinary connections</td> </tr> </tbody> </table>	• Blended learning	• Flip instruction	• Clickers... Audience response systems	• Team learning	• Interdisciplinary connections	<p>Use the best web based tutorials as a base for the content then use clickers in classroom to re-enforce the learning (in a flipped fashion, on-line studying at home first and in-class working examples after).</p> <p>https://learningcatalytics.com/</p>
• Blended learning							
• Flip instruction							
• Clickers... Audience response systems							
• Team learning							
• Interdisciplinary connections							
<p>References:</p>	<p>The Reformers Are Leaving Our Schools in the 20th Century Why most U.S. school reformers are on the wrong track, and how to get our kids' education right for the future By Marc Prensky marc@games2train.com</p>						
	<p>Ideal problem Solver, 1993</p>	<p>John Bransford & Barry Stein</p>					
	<p>Disrupting Class, 2008</p>	<p>Clayton Christensen, Michael Horn, Curtis Johnson</p>					
	<p>Engineering Lens www.engineeringlens.org</p>						

Interdisciplinary Learning Approach:

