

Just-in-time or Just-In-Case learning?

The high-tech manufacturing industry learned a lesson many years ago that they do not need to have large warehouses full of parts in order to meet the needs of their customers. In the early days, the personal computer manufacturers would have a room full of hard drives, a room full of cases, and a room full of power supplies. They soon discovered that the inventory was obsolete before it was all sold.

Early in the 1970's Taiichi Ohno was looking for a way to meet the constant demand of Toyota customers in the fast-changing world of the auto industry. He was looking for a way to eliminate waste of space, inventory, and motion. In order to do that, he found ways to have Toyota's supply chain located very close to Toyota's manufacturing plant. If they knew they would produce 150 Camry's on June 8th, they received a shipment of 150 windshields on June 7th and every other part that was needed. Parts were not stored, they went straight to the manufacturing floor and into the automobile. They rolled those vehicles off of the assembly line and directly onto a waiting ship or train. This is called Just-In-Time manufacturing, or JIT.

Most education systems in the United States were created around a different manufacturing model called Just-In-Case manufacturing. In that older model, manufacturers stored products in case they had a customer order that they needed to get out the door quickly. Their suppliers were slow and orders had to be made months in advance. They would continually build their products and store them for an eventual sale. When sales were down and the storehouse was full, they laid off their workers.

Educators tend to teach from a "Just-In-Case" (JIC) perspective. We want students to learn things that they MIGHT need in the future. Often times, the subject or standard is not relevant to the life of the student today, but we want them to be prepared for their adult self. Unfortunately, some of my teachers missed the mark. They prepared me for possible things 40+ years ago that I have yet to need in my life today. For example, I know to crawl under my desk in the case of a nuclear attack by the "Commies". I know that 90% of bird species are monogamous. I know that ancient Egyptian priests were forbidden to eat onions because they were considered to be an aphrodisiac. I know how to look something up in a dictionary if I don't understand it.

Nevertheless, I had teachers that also prepared me for things that have helped me make quick decisions. I know how to parallel park faster than most of my peers. If my bedroom is 11'x12', I know that it has 132 square feet in it. I know that if the walls are 9' high, it contains 1,188 cubic feet of space. I know how to read and when I don't understand a word (which is often), I know how to look it up. I no longer use a dictionary, but I understand that there is a compilation of known English words and that many words have multiple meanings and that there may be multiple pronunciations.

So, educators, what do our children need to know JIC and what do they need to know JIT?

In 2014, Pearson published "[The Learning Curve Report](#)". At that time, much focus was given to the 8 essential skills that students would need for the future. Those skills, as reported by Pearson are:

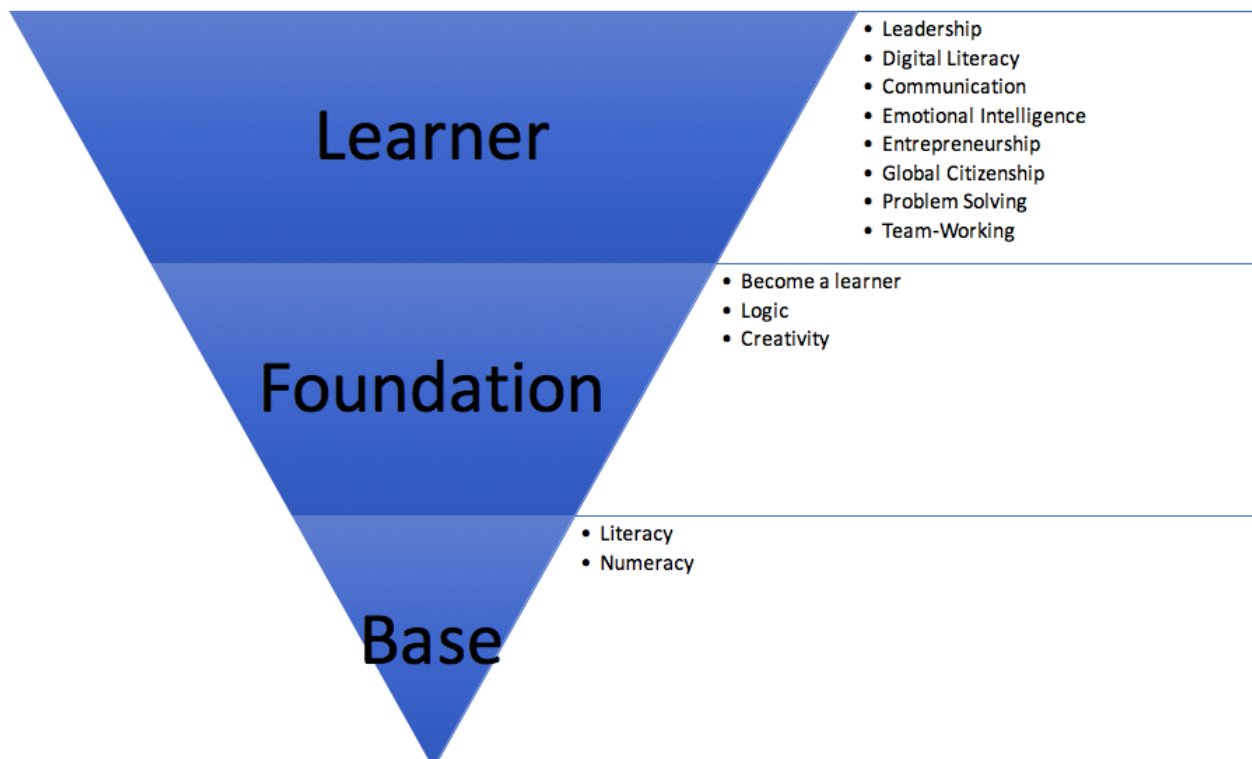
1. Leadership
2. Digital Literacy
3. Communication
4. Emotional Intelligence
5. Entrepreneurship
6. Global Citizenship
7. Problem Solving
8. Team-Working

What Pearson also reported, but has been widely left out by educators is that these skills are impossible if they are not built on a foundation of numeracy and literacy. In other words, the report is saying that there are at least 2 basic skills that students must have, just-in-case, in order to learn the broader skills that they will need to be successful in this generation.

I would add that somewhere between the 2 basic skills and the 8 essential skills of Pearson are 3 more skills that bridge the divide and help to form individuals that will be successful regardless of the change we see in the future. The 3 skills that are JIC skills are:

1. Learning to learn
2. Logic
3. Creativity

Graphically this hierarchy might look something like the following figure.



Becoming a learner is a skill that can be taught. The work of Carol Dweck and others on Growth Mindset have now firmly convinced me that our students can learn to learn. They can stretch their brain and that there is no time in our lives that we stop being able to learn more.

Logic can be taught in many different ways. It can be taught through coding. It can be taught through history lessons. It can be taught through algebra. However, it needs to be taught as a skill that will be useful across all disciplines and throughout life. Logic will contribute to the wider skills in that it is foundational to Communication, Global Citizenship, Problem Solving, and others.

Creativity is needed for a variety of reasons, but the most important reason is that it allows people to innovate. The various forms of the arts contribute to our lives as humans, but the arts also form in us a way to think about problem-solving and our future in new and creative ways. If you were to judge my creativity based on how well I could paint a mountain stream, you might think that creativity is not for everyone. Keep in mind that creativity is more about creation of ideas, concepts, and solutions than it is about aesthetics. Creativity can be learned and when it is learned well, it contributes to all the wider skills on the list.

In today's modern manufacturing centers, tools and machinery need to be in place and ready so that when the JIT supply and demand hits, they will be available to be used as resources. Our students are the same. If our students know how to learn, and they have the foundational tools, they can adjust to any change that comes their way.

Readers. What would you add to this discussion? What are the subjects that our students need just-in-case? What can they wait to learn when they need to learn it – just-in-time?

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