# INNOVATION AGE LEARNING

## Empowering Students by Empowering Teachers

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## Empowering Students through the 4Cs

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CHAPTER 1

# Thriving in the Innovation Age

> We need to out-innovate, out-educate, and out-build the rest of the world.
>
> —President Barack Obama, State of the Union Address, January 2011

Are we really in the Innovation Age? What demands does it place on students? How can educators prepare students to thrive in the Innovation Age? Instead of starting over, how can good instructional strategies be retrofitted to meet the needs of today's students?

## What Do We Mean by "Innovation?"

The term "innovation" is used liberally when it comes to technology-infused initiatives, but it has several meanings. The *Merriam–Webster Online Dictionary* defines innovation as 1) the introduction of something new, or 2) a new idea, method, or device. Looking at the Latin origins, innovation means "to renew or change into new."

Innovation can easily be confused with creativity, invention, and improvement. It is important to understand the difference. Creativity is about the expression of or impetus behind ideas and thinking, while innovation is the implementation of an idea. Whereas invention is about the creation of a novel device, innovation is in the use of such ideas or methods. Improvement is doing the same thing better, while innovation may take an existing practice in a new direction.

Its scale can categorize innovation. Disruptive innovation is a radical change that starts at the bottom of a [market] system and relentlessly moves up to replace the existing leader (Zhao, 2012). Personal computers triggered disruptive innovation because they created a vast new market for accessible data. Craigslist changed the way classified ads are posted and viewed; iTunes drastically changed the way we acquire and listen to music.

Sustaining innovation is characterized by changes to an existing model and how it is used (Modi, 2011). Cell phone developers like to claim each new model is a sustaining innovation. Business leaders have identified different models of innovation that benefit their companies by rethinking internal processes and changing the way goods or services are provided. Amazon's Jeff Bezos, for one. Solar entrepreneurs offer an environmentally-friendly alternative that taps into existing power systems.

Innovation can take any form; it has prevailed for centuries. So why are we suddenly in the Innovation Age?




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## The Information Age Gives Way to the Innovation Age

In the information age, the use of computer technology and the internet made it possible to collect and disseminate information in digital form. The dominant economic force shifted from manufacturing to creating systems that could efficiently access, generate, and analyze data, turn it into information, and consolidate the content into accessible knowledge. Information such as books, images, music, and periodicals became readily available online. Students with access to the internet were taught information literacy and digital-age skills; those who couldn't attend certain classes often enrolled in online courses.

The Innovation Age can be seen as a response to "info-glut" and the tech-savvy, globally connected economy brought about by information-age advances. We live in a time where success has become less about knowledge and more about what one does with it. Continuous improvement and innovation is the responsibility of all workers, not just the research and development department. Companies of all sizes train their members to be effective collaborators, communicators, creators, and critical thinkers.

Here are some indicators that innovation, not pure information, rules the day:

- Would you rather invest in a start-up or a bookstore?
- Would students prefer a Maker Faire or a trivia contest?
- Should students simply show their results, or show multiple ways of solving the problem?
- Would you rather "Ask an Expert" or "crowd-source" a solution?

Organizations, including those in education, can no longer justify the this-is-the-curriculum-I have-always-used mindset. Instead, they must incorporate collaboration, communication, creativity, and critical thinking and rely less on multiple-choice tests and single "right" answers.

To be competitive in the global economy, every nation needs to develop future innovators. In order to meet this challenge, we need to first understand how successful innovators work.

## Innovation Process

One thing innovators have in common is that they enjoy collaborative work. The innovation process generally starts with a problem and involves an idea or solution, multiple perspectives, revision, and persistence. Let's look at the steps in the innovation process as described by two innovation experts, David Kelley and Tarak Modi.

David Kelley, founder of IDEO, an international design and consulting firm located in Palo Alto, California, has been in the innovation business for decades. His company has been credited with designing more than 1,000 products, but he is perhaps most famous for working with Steve Jobs.

Kelley also founded the Hasso Plattner Institute of Design (d.school) at Stanford University. Graduate students from different disciplines participate in this program, which encourages innovation in terms of design thinking, or thinking like a designer. The program doesn't lead to a certificate or degree and still the number of applicants is far greater than the number of spots available.

In a 2013 episode of *60 Minutes,* Kelley said, "The big thing about design thinking is it allows people to build on the ideas of others. Instead of just having this one thread…we get to a place that we could not have reached on our own. You have to have diversity and collaboration…empathy for the consumer." He advocates identifying the big idea and looking to others to generate exciting ideas. Kelley's primary steps for design thinking:

1. **Inspiration.** Go into the field to gain a better understanding of your user and their challenge, whether it is in their domain or unrelated domains.
2. **Synthesis.** Make sense of your findings by looking for patterns.
3. **Ideation and Experimentation.** Consider all options and experiment with numerous prototypes, without becoming attached to any one solution. Get feedback from multiple stakeholders and hear all perspectives.
4. **Implementation.** Refine the "best" solution and roll it out.

There is no magic formula for innovation. Tarak Modi is an innovation expert and author of many articles on its process. In his book *Living in the Innovation Age:*




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*Five Principles for Prospering in the New Era* (2011), Modi describes six phases in what he calls the "Innovation Life Cycle":

1. **Ideation.** Ideas are submitted, discussed, and rated.
2. **Selection.** The "best" ideas are selected and moved into the process.
3. **Inception.** Selected ideas are developed to a high degree of detail.
4. **Presentation.** Selected ideas are presented to stakeholders.
5. **Elaboration.** Stakeholder-selected projects are mapped out against projected milestones/goals and timeline.
6. **Transition.** Implementation of product, prototype, or demonstration of innovation.

While the six phases of the Innovation Life Cycle apply to business development, there are two important takeaways for educators: 1) the innovation process is fluid and iterative, and 2) its adoption cycle no longer takes years. Companies that have a protracted adoption cycle risk losing their competitive edge. Likewise, education needs to keep innovating for students to remain competitive.

## Traits of Successful Innovators

Is the ability to innovate determined by nurture or nature?

Researchers have estimated that roughly two-thirds of our innovation skills can be learned or nurtured. In *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators* (2011), authors Dyer, Gregersen, and Christensen identify five skills that underpin the ability to innovate: questioning, observing, networking, experimenting, and associational thinking.

In *Creating Innovators: The Making of Young People Who Will Change the World* (2012), Tony Wagner lists the essential qualities of successful innovators as curiosity, collaboration (which begins with listening and learning from other perspectives), associational or integrative thinking, and bias toward action and experimentation. He also says that these qualities are not limited to those born predisposed to innovation, but can and should be encouraged in all learners through a process that includes play, leads to passion, and matures into purpose.