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Laurie's Bio:

Laurie is currently teaching Data Visualization at Art Center College of Design, Pasadena CA; in addition, she is professor emeritus at Pasadena City College. Since 2009, she currently is the Education Innovation Advisor for Lynda.com, a LinkedIn Company as well as consults for companies as well as universities. She advocates for academic initiatives, supports excellence in teaching and learning, and provides integration and implementation for systems-wide online teaching and learning solutions. Laurie evangelizes all things education and learning as a thought leader and public speaker and writer. Before consulting, she served for 22 years as a professor in Interaction Design and as the director of the Pasadena City College Digital Media, serving the state of California as a regional resource for collaboration between education, industry, and the community. Her passion is digital storytelling.

Title: Innovation in the Classroom: Do it! Make it!

Abstract (300 words):

As educators, how can we identify and foster key tenants of innovation? If we focus on producing innovators, not subject matter experts, how might we shift our teaching approach? What lessons can we learn from real world leaders who possess the traits of risk-taking, curiosity, and creativity? This session provides practical examples of how to incorporate questioning, experimentation, observation, association, and sharing into our curriculums.

Join Laurie Burruss in exploring prototype driven, human-centered innovation processes, for creating an innovative classroom environment. She jumpstarts her teaching by having learners employ "design thinking" to create experiences for the "real world" in a variety of form factors. Explore developing emotional connections with an intended audience, imagining new solutions, and creating user-centered experiences for hands-on, high-energy design challenges that lead to innovation, experimentation and discovery. Appreciate how these processes apply to developing each student's personal innovative strategy and artistic viewpoint for solving problems within school and forward into industry.

- Experience several "best practices" currently used in industry as well as in education.
- Learn about the seven stages of design thinking: *define, research, ideate, prototype, choose, implement, and learn*
- Explore how to integrate innovation into the curriculum

Paper (3,591 words + Resources)

I. INNOVATION

In 2009, I took a leave of absence from Pasadena City College. I left higher education where I worked and taught design and interaction design to work 2 years full-time at a fast-paced internet technology company called Lynda.com, now a company of LinkedIn.

Three big “ahas” occurred for me.

1. I witnessed the active practice of questioning, observing, networking, experimenting & I saw numbers of employees who were either failing or “clueless” as to how to do these things.
2. I realized what business wants are a track record that demonstrates discovery skills, possession of expertise in one knowledge area and breadth in a few, and a passion – to change the world and make a difference. An expectation of EXCELLENCE.
3. After looking up innovation in colleges and universities, I saw the “innovation” programs appeared in business schools’ course listings but not necessarily “liberal arts” or “art and design” programs. However, understanding innovation practices is not just a skill set for entrepreneur programs but a skillset required all types of jobs and in all parts of today’s 21st century global organizations.

When I went to the dictionary, innovation is defined as “into the new.” And in looking at the antonym – the word “stagnate” gave even more clarity to my understanding – it’s about movement.

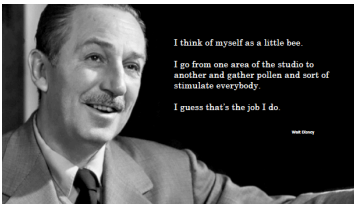
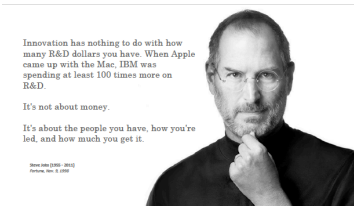
How do we define an innovator? We know for instance if the CEO is an innovator, the company is more likely to be innovative. Disney was the consummate innovator. He termed this practice as being a “cross-pollinator” or “the stimulator.” In the book, *The Innovator’s DNA*, the three authors, Dyer, Gregersen and Christensen, examine how business looks at innovation? The term “innovation DNA” is defines as the discovery quotient or an index of a company’s performance currently while simultaneously looking to the future. This understanding is really about two additional factors – both forward looking and historical performance. (Dyer, Gregersen and Christensen (2014). *The Innovator’s DNA*. P. 179.)

They conducted interviews with 500 plus innovators, 5,000 plus executives, in 75 countries. The book itself has in-depth profile for determining a person’s innovation leadership profile. The profiles of top innovators are high in observation (85), association (100), questioning (95), diverse networking, and experimenting (over half). These were leaders from Dell, Blackberry, eBay, Intuit and so forth.

(<http://innovatorsdna.com/innovators-assessments/>)

An innovator according **The Innovator’s DNA** is:

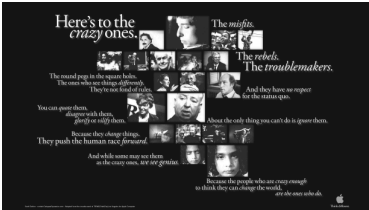
- A person with infectious curiosity who is interested in discovering how we can provide ever more delightful experiences to improve our lives (what clicked for me in ArtCenter’s Design Matters program.)



- A creative catalyst,
- An advocate or “coach,”
- A facilitator of an innovation philosophy & processes,
- A cross-pollinator.

(Dyer, Gregersen and Christensen (2014). *The Innovator’s DNA*. p. 44, 179.)

It occurred to me that this description closely resembles the role of an educator (trainer, team leader, manager) in a 21st century school or workplace.



More importantly, an innovator has a vision that people can get behind: for example, the “Think Different” Campaign - inspired people, inspired a change of culture. When Steve Jobs returned for his second time to Apple, he commented: “The whole purpose of the ‘Think Different’ campaign was that people had forgotten what Apple stood for, including the employees. . . [and I thought] if you don’t know somebody very well, you ask them, ‘Who are your heroes?’ Our heroes are innovators. We stand for innovations. If you want to work at Apple, we expect you to be an innovator who wants to change the world.”

How would you rank your Innovative DNA?

- Am I good at generating innovative ideas?
- Do I know how to find innovative people for my organization?
- Do I know how to teach people to be more creative and innovative?
- Am I an innovator?

The typical response in audiences, workshops, and classes is 30 per cent of the people raise their hands.

To teach different, we as educators, artists, illustrators, and designers must act different and so think different. To innovate is not merely a function of the mind, but a function of behaviors. It’s all about “Do it! Make it!” By changing our behaviors, we can improve our creative impact and thus change outcomes.



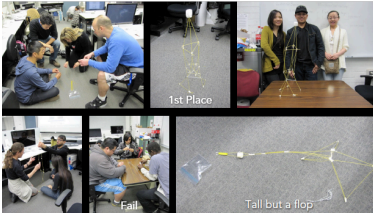
Education and training have historically focused on cognitive - or what is termed associational thinking but the good news is that the behavioral skills of questioning, observing, networking, & experimenting are completely TEACHABLE! (Dyer, Gregersen and Christensen (2014). *The Innovator’s DNA*. pp. 23 - 25.)

ASSOCIATION: adjacent possibilities, making connections across seemingly unrelated questions, problems of ideas.

QUESTIONING: passion for inquiry, the desire to change the status quo, a willingness to take “smart” risks, the motivation to make change happen, the courage to make mistakes.

OBSERVING: intensely watching the world around you, acquiring information from multiple senses.

NETWORKING: finding and testing ideas through diverse networks of individuals and experiences, searching for new ideas by talking to people who offer radically different views.



EXPERIMENTING: creating new experiences, piloting new ideas, exploring intellectually, experientially, with conviction held back, testing new hypotheses. (Dyer, Gregersen and Christensen (2014). *The Innovator's DNA*. pp. 41,65, 89, 113, & 133.)

The Learner INNOVATION COMMONS	
• connect ideas	ASSOCIATION
• bridge disciplines	NETWORKING
• cope with complexity	ASSOCIATION
• iteration is not a sign of mistakes nor failure	QUESTIONING
• learn by doing	EXPERIMENTING
• take risks	EXPERIMENTING
• borrow & adapt from the past	ASSOCIATION
• allow for emotional influence	OBSERVING

As educators, we can identify and foster key tenants of innovation. If we focus on producing innovators, not subject matter experts, we will naturally shift our teaching approaches.

II. DESIGN THINKING

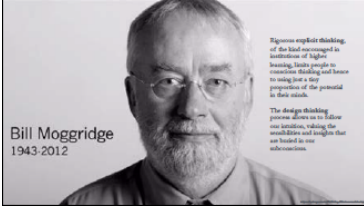


Many good models exist for innovative design thinking. Exploring prototype driven, human-centered innovation processes helps in the understanding of creating an innovative classroom environment. As educators, we can jumpstart our teaching practices by having learners employ a framework like “design thinking” to create experiences for the “real world” in a variety of form factors. IDEO provides a template and has codified a “common language for such a creative or innovative processes. It’s not the only one but, arbitrarily, I have chosen this open-ended framework or strategy as it allows learners to explore developing emotional connections with an intended audience, imagine new solutions, and create user-centered experiences for hands-on, high-energy design challenges that lead to innovation, experimentation and discovery. These processes apply to developing each student’s personal innovative strategy and artistic viewpoint for solving problems within school and forward into industry.

What is design thinking? It’s not just a process for problem-solving but a multimodal literacy needed and required by all of us to communicate and to connect effectively. Design thinking is, at core, a MODEL or FRAMEWORK that:

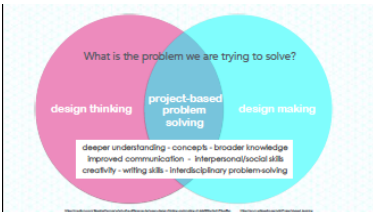
- Defines the needs through observation and immersion
- Is based on brainstorming and experimentation
- Creates prototypes
- Requires feedback, testing, and continuous iteration throughout the cycle.

To understand design thinking is to look deeply at all human experiences – to feel inspired, full of ideas, and ready to create and/or implement human-centered projects that solve problems. It is sensory; it is language and meaning; it’s a point-of-view or position; it is imagery and metaphor; it is a story; it is expressive not perfunctory; it is experiential. In sum, as Bill Moggridge emphasized, it is not explicit thinking but intuitive insights that generate ideas and create both memorable and inspirational experiences.



At the intersection of Design thinking and Design Making is the heart or what is termed Project-based Problem-solving.

- **Design Thinking** is a critical process for solving complex, open-ended problems that don’t have a “right” answer.
- **Design Making** is the act of “making a thing” that didn’t exist - an act of creation (yes, a celebration!)/
- **Problem-solving** is active & inquiry-based knowledge - the integration of knowing & doing - problem-solving by investigation authentic or “real life” research



In sum, it’s a practice that asks the question What is the problem we are trying to solve?



Some key principles underlay Design Thinking:

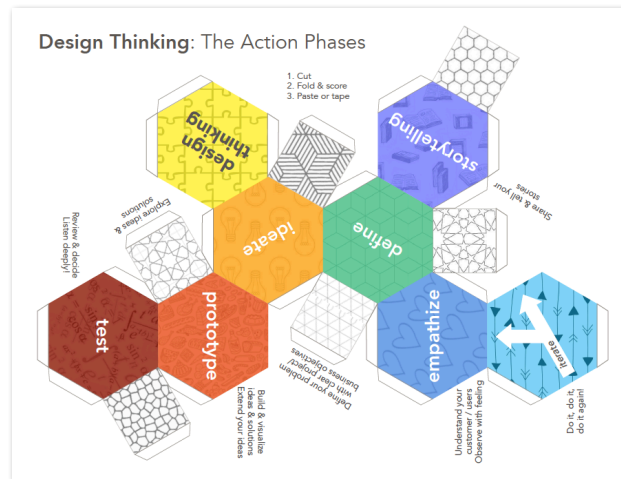
ITERATION: repetition both forwards and backwards till clarity is reached within the time restraints.

DIVERGENCE: creation of choices; allowance for feelings of optimism; exploration; opening up to possibilities

CONVERGENCE: making choice, selection, analysis, synthesis, breaking apart problems and putting ideas back together into one whole

TANGIBLE DELIVERABLES: a set of deliverable resources and tools at every step

INTEGRATION: the combining of one thing with another so that all parts become a whole - in an effort to merge, unite, blend, & assimilate



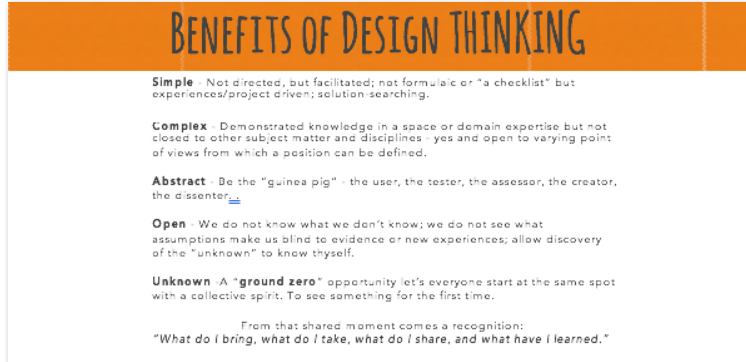
The Design Thinking PROCESS has 5 phases:

1. Empathy - understanding the world from your user's point of view
2. Problem definition - defining the problem carefully
3. Brainstorming - creating as many ideas as possible and exploring possibilities
4. Prototyping - rapidly building a low fidelity prototype from which to learn - creating the story
5. Testing - having the customer/user/client use the prototype & gathering feedback

The Gift from IDEO and Stanford's d.School is the ability to have language that we all can understand and that has shared meaning - a framework, a vocabulary, a process that is flexible, adaptable and is good fit for students in the studio to launch open-ended design problem-solving projects. The outcome is always learning.

My students have observed that there are many benefits to this practice:

- Interdisciplinary perspectives
- Innovative thinking and creative problem-solving
- Alignment of outcomes and goals with the intended audience
- Effective and informative experiences for the student learner
- Continuous expansion of knowledge
- A culture of making stuff to make experiences



Higher education's challenge is that our current basic organizing principle is around academic divisions and/or media-titled courses. We want our students, our learners, our faculty - to think deeply, roam widely, explore a range of questions, approach life from many different angles, to go from self-containment to porous borders that result in the creation of interdisciplinary learning "storms" whose focus are "wicked" challenges that can only be confronted by design thinking and collaboration.

As artists, designers, teachers, professionals, WE are the ones who always "think different". We own an enviable space - much sought after by the rest of the world. Our position or tenet is to explore, discover, experiment, observe, question, and through associations bring new light to problems. We bear the responsibility of intelligent communicators. IT IS HARD to give up basing decisions based on historic precedent in favor of contextual

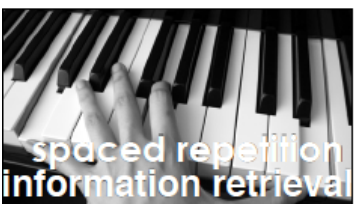
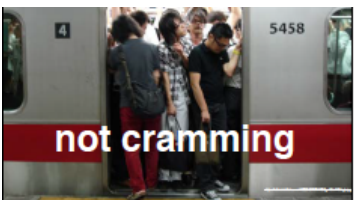
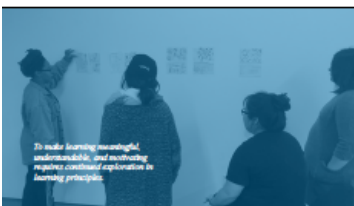
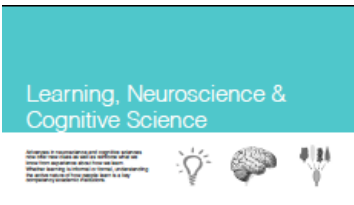
need. IT IS HARD TO institute ideas and practices that move beyond just adding technology form factors to the ever-growing menus in the cafeteria line in our schools' curriculum. THE CALL is for self-awareness of our institutions, to let go of outmoded positions to maintain vitality, to practice Design Thinking in the present context of today, and to FREE ourselves to renew and recreate our ideas about teaching and learning as needed. To recap – it's a sea change to participate in creating a culture of making experiences.

III. 9 LEARNING STRATEGIES

Teaching learning strategies is a simple and direct way to integrate innovation into the curriculum as well as teacher the student how to learn.

The marriage of the studies being conducted in the areas of learning, neuroscience and cognitive science is moving what educators knew only anecdotally to a data-driven understanding of how we learn and how we can learn better. In an age of access to all knowledge, exploring learning principles or what I term "learning strategies" is the great gift educators can give to their students and colleagues. When learning is meaningful, understandable and motivating, deeper engagement and a sense of delight and joy in continuous learning is the result.

Each of the following learning strategies embraces three perspectives: Concept (the big idea or theory), Data (that drives and supports the research), & most importantly Application (real-world case & uses).



1. Learning by PRACTICE: not cramming but spaced repetition coupled with information retrieval
2. Learning in CHUNKS: breaking the learning into small "chunks" makes it more digestible, doable, and achievable with practice over time.
3. CROSS-TRAIN as you learn: mixing or interleaving your practice of skills that you are seeking to develop leads to ownership, the ability to apply to other learning and higher retention over time
4. Learning FRAMEWORKS: a framework is a way to organize complex information and later retrieve or present – like a rubric
5. Learning take EFFORT: effortful learning is active learning like challenges or learning sprints – a way to encourage a growth mindset – a try it and see what happens attitude
6. Learning that STICKS: practice that's spaced out, interleaved with other learning and varied produces better mastery, longer retention, and more versatility; it allows the brain to consolidate and not to procrastinate (the opposite of sticky learning)
7. Learning MOTIVATES: the three motivators are retrieval (I need it now to go forward with what I'm doing now), extrinsic (for others, for scholarship and grades, for a job, for recognition), and intrinsic (passion for subject matter or idea) and there are perks associated with all three types.
8. Learning ENGAGES: it's termed the Spiral Effect or the return to learn; a cumulative learning that draws the learner back in again and again allowing for changes in understanding, seeing anew, gaining new insights, and immersion in problem-solving. It's a way to self-assess.



9. Learning from PEERS: people learn better both alone and together; people practice better within a group that supports their collective learning and shared similar activities. Yes, we learn from creating and our sharing our stories.

The above learning strategies really do help and motivate students, but there are a number of obstacles that the learner will purport are keeping them from success. The top five are: not enough time, not enough guidance or direction, not enough recognition or reward, not engaging enough, and too hard to find. In addition, learners often have illusions of competence. Some ways to address this illusion are recall or mental retrieval, self-testing or quizzing, changing up the location, interleaving the learning, using peer learning or role playing, simulating “real world” doing and making, and moments of reflection. Generally, a need exists for more complex problem solving within the curriculum. You can also teach students how to use the tools you use for effective teaching in their own studies - rubrics, surveys, polling, iterative feedback, and stretching the project outcomes to achieve more good. A model called Made to Stick – Succes Model (*Made to Stick, Heath & Heath, 2007.*) has a simple system for remembering learning principles.

- Simple - core concept
- Unexpected - grab attention
- Concrete - image > reality, man on moon
- Credible - stats and data, famous endorsement, add detail
- Emotive - connection/feeling humanity
- Story - put it all together in one

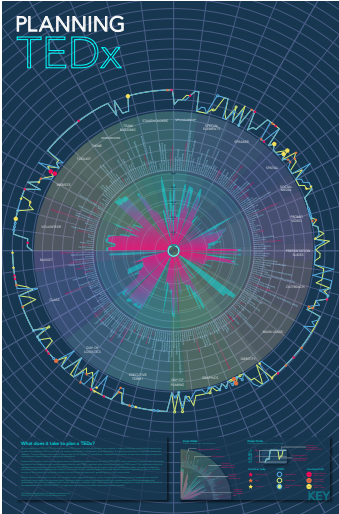
Promote learning across your ecosystem. Identify people at the mid-level positions who can lead this charge (and by all means give them permission to add learning to the team or class responsibilities what I call RD &L). Focus on empowered individual learning. Teach others how to learn to attain high standards and promote your campus’ learning strategies. You are the driver. You are the advocate for this culture of learning at your institution.

IV. CHALLENGES – not EXERCISES

- The Illustrated Interview
- Rollcall Self Portrait
- Data Viz Makeover
- Slide Makeover
- Animated Icon (GIF)
- Data Viz Fairytale
- Visual Notetaking
- Draw Toast
- Timeboxing: Mobile Prototyping

V. PROJECT –BASED PROBLEM-SOLVING – not ASSIGNMENTS

- Dear Data Diary: I & II



- Make a Map: Where I Live, How I Go to School
- The Data-Driven Compelling Presentation: Slidument + 3 minute story – Homeless Union Station, Foothill Unity Food Bank, Santa Monica Community
- Infographic/Animated Infographic
- Tree – Korean Food, TEDx, Hate Words
- Music Mash Up
- Union Station Homeless Project: Zine/Map (collaboration)
- Five Minute Video to teach something in five steps: Third Stop: Boba Drinks



VI. CASE STUDIES

- Challenge: Make a Chair
- Bread for Life: Storm Sandy + Red Cross (2 teachers, 2 graduates, 2 students in a MOOC)
- Houston Community College: Entrepreneur Program Workshop
- Frog Design: Aging in Place
- One Acre: Promo Video
- Design Thinking Crash Course
- CreatingInnovators.com

VII. CONCLUSION

Innovation is an investment in yourself, in others, and in your institutions from top to bottom and side to side. Innovation is everyone’s job. It’s a culture of learn by doing. It’s a culture of ideas leading to wonder and invention. It’s moving from a fear of judgment to self-efficacy – the rediscovery of creative confidence we all had as children. I feel most educators are innovators whose success is based on innovative practices. Thus, our role as teachers is to foster “guided mastery.” The steps to integrating a culture of innovation in the studio are to:

- Intervene (perform, model, devise challenges) for our classes, our teams, our cohorts by designing “stretch” projects
- Develop knowledge and skills that lead to proficiency and flexibility what is termed competency
- Promote our students’ independence - self-initiative, self-motivation, self-empowerment.

The most successful innovative creative learners are the ones who learn to educate themselves. This idea makes innovation possible. These learners share across teams and organizations, they recognize the value of mastery, they advocate for smart risk-taking that bring great rewards and return on investment, they exceed our expectations.

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