Fostering Creative Thinking and Innovation

Some Practical, Research-based Strategies

An Interactive Session in the 2016 Assessment Forum on Enhancing Innovation in Learning, Teaching and Assessment: Using Research-Based Strategies

Sponsored by The Office of Academic Assessment at The University of Oklahoma

1:10-2:25 PM – Friday 16 September 2016

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Since 1981, when I began teaching college, there’s been a great deal of innovation in communication and educational technologies.

Let’s start with a quick “background knowledge” assessment on tecnologies used in 1981.
A Warm-up Exercise

In 1981, what percentage of the US population:

A. Owned cell phones? ___ % (of individuals)
B. Owned computers? ___% (of households)
C. Owned GPS devices? ___ % (in cars or cell phones)
D. Used the Internet? ___% (of individuals)
E. Used the Web? ___% (of individuals)
F. Had completed 4-yr degree ___% (of over 25’s)
How interested are you now in knowing the answers?

A. Very
B. Somewhat
C. Not very
D. When’s the Reception?
A Warm-up Exercise

In 1981, approximately what %-age of the US population:

A. Owned cell phones? 0 % (of individuals) [1983]
B. Owned computers? 1-2% (of households)
C. Owned GPS devices? 0 % (in cars or cells) [1995]
D. Used the Internet? 1%? (of individuals) [1989]
E. Used the Web? 0% (of individuals) [1993]
F. Had completed 4-yr degree 17% (of over 25s)
Obviously, the overall amount of technological innovation since 1981 has been astounding.

But what about specific technological tools used in higher education?
When did these technological teaching tools become widely available?

A. Laptops? 1983
B. Learning Management Systems? 1990
C. PowerPoint? 1990
D. Wikipedia? 2001
E. E-textbooks? Late 1990s.
There’s **BIG “C”** creativity

Let’s generate some examples.

Jane Austen, Shakespeare, Marie Curie, Albert Einstein and so on . . .

And there’s **small ‘c’** creativity

This session is mainly about small ‘c’ creativity
Small ‘c’ creativity

Is widely distributed among all populations.

Often involves: “coming up with fresh ideas for changing products, services and processes so as to better achieve the organization’s goals.”

T. Amabile, et al. (2005)

Depends on cognitive, metacognitive and interpersonal skills that can be taught and learned by any normal individual.

R.L. DeHaan (2008)

Is still rarely taught systematically or well.
So, small ‘c’ creativity

Is teachable and learnable by virtually all students.

Is valued in virtually all disciplines and fields

Is valued by a great many employers

But it is still rarely taught systematically or well in higher education.
Common beliefs about C&I

Quickly mark each of the 14 items in the list.

Put a plus sign ( + ) in front of ones you agree with.

Put a minus sign ( - ) in front of ones you disagree with.

Put a question mark (?) if you’re unsure
Common beliefs about creativity and innovation – page 2

1. Talent matters a lot
2. You need a high IQ to be big-C creative
3. Creativity and innovation are the same thing
4. How creative individuals create is still a mystery
5. Brainstorming is a productive 1st step in innovation
6. Most important innovations were made by lone rangers
7. Groups are typically more creative/innovative than individuals
8. More expertise = more creativity
9. Less expertise = more creativity
10. Youth = more creativity
11. More creative = more ethical
12. Prizes and $ incentives promote creativity & innovation
13. Criticism inhibits creativity & innovation
14. Rules and constraints limit creativity & innovation
To be “creative,” do you need . . .

  Talent?

  A high IQ?

  Youth?
How are the following terms related?

Originality
Creativity
Innovation
The creative process: Mystery solved! (?)

Typically, *creativity* involves 3 activities:

1. Divergent thinking
2. Convergent thinking
3. Analogical thinking

*Innovation* requires a fourth:

4. Practical problem solving
1. Divergent thinking
   (Generating ideas)

2. Convergent thinking
   (Evaluating ideas)

3. Analogical thinking
   (Making connections)

[4. Practical problem solving]
   (Designing implementation)
Brainstorming (Divergent)
Why we so often get it wrong
And how we can improve it.

• Choose appropriate problems/questions
• Make the generative focus clear
  [Don’t confuse it with critiquing.]
• Teach students a process to follow
• Ensure students are well prepared
• Give explicit how-to instructions
• Monitor and coach students throughout
• Make it consequential
Critiquing (Convergent)
Why we so often get it wrong
And how we can improve it.

• Use it at the right moments in the process
• Make the constructive focus clear
  [Don’t confuse it with criticizing.]
• Teach students a process to follow
• Ensure students are well prepared
• Give explicit how-to instructions
  [Try, “plussing,” for example.]
• Monitor and coach students throughout
• Make it consequential
Metacognition involves . . .

- **Self-Awareness**
  Knowing that and when you are thinking

- **Self-Monitoring**
  Noticing the quality/intensity of your thinking

- **Self-Regulation**
  Directing/Correcting your thinking

Reflection requires metacognition, but goes beyond it to affect/change values, beliefs, actions and/or habits
A Reflection-in-Action Exercise

Rate your own learning approach thus far in the session:

1. Disengaged (I don’t see the point, or I already know all this.)

2. Semi-attentive (Checking in and out, per my interests.)

3. Engaged recipient (I’m taking it all in, but quietly.)

4. Active Participant (I’m contributing & cooperating.)

5. Reflective Synthesizer
   (I’m making connections to prior knowledge/experience and imagining how I might use this in my future work.)

Expertise

Is a “Goldilocks zone” issue in creativity

Having too little expertise in a domain usually makes creativity impossible
Having too much expertise can lead to routine thinking

There seems to be a “just right” zone – enough expertise to know the rules and have all the tools, but not so much that you’ve figured out and memorized all the answers.
What’s left to talk about?

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**Impeding** Creativity & Innovation

- Fixed mindset/Belief in C&I “myths”
- Insufficient/unfocused passion/motivation
- Insufficient expertise in the domain
- Insufficient C&I process knowledge & skills
- Failure to find an engaged community
- Fear of failure
- Insufficient resilience/perseverance
- Unsupportive/hostile environment
Promoting Creativity & Innovation
Research-based approaches

Our curricula and teaching can help learners to:

• Develop a “growth” mindset – replace self-limiting C&I myths with empirical knowledge
• Identify their passions/goals/motivations
• Develop expertise in relevant domains
• Master key C&I process skills
• Find safe but challenging “learning communities”
• Engineer productive, educative failures


• Develop skills for resilience/perseverance
• Identify “generative” environments for living and working
Creative Thinking & Innovation are already on the short list of Higher-Order Thinking Skills every college and university claims to value and develop.

So, we don’t need to create new courses, programs or majors.
Developing *Creative Thinking and Innovation* skills require more time and effort than any single course or teacher can provide.

To succeed, we need to design and weave C&I systematically throughout and across our degree programs.
I’d argue we need creative thinking and innovation more than ever . . . and we must not delay preparing our students to face the world that we, in large part, have created.
Thanks for your time and participation today. And best wishes for success in your work.