Fostering Creative Thinking and Innovation

A Few Practical, Research-based Strategies

Handout for the Keynote Session in the University of Toledo's

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Some common beliefs about creativity and innovation we might examine

Directions – Please mark each statement in the list below in the following way:

If you agree with the statement, put a plus sign (+) in front of it;

If you disagree, put a minus sign (–) in front of it; or

If you are unsure, put a question mark (?)

1st Response		*2nd Response*
____	1. Talent (of the genetic sort) matters a lot in creativity	1. ____
____	2. You need a high IQ to be big-C Creative	2. ____
____	3. Creativity and invention are one and the same thing	3. ____
____	4. Creativity and innovation are one and the same thing	4. ____
____	5. How creative individuals create is still a mystery	5. ____
____	6. Group brainstorming is a productive first step in innovation	6. ____
____	7. Most important innovations were created by individuals working alone	7. ____
____	8. The more expertise you have, the more creative you are likely to be	8. ____
____	9. The less expertise you have, the more creative you are likely to be	9. ____
____	10. Younger people (under 30) are generally more creative than older ones	10. ____
____	11. The more creative you are, the more ethical you are likely to be	11. ____
____	12. Prizes and other incentives promote creativity and innovation	12. ____
____	13. Criticism inhibits creative thinking and innovation	13. ____
____	14. Rules and similar constraints inhibit creative thinking and innovation	14. ____

A few questions we might consider . . .

1. What do we mean by creative thinking?
2. Is there more than one "flavor" of creative thinking?
3. What "habits of mind" does creative thinking require?
4. What kinds of creative thinking do our courses promote? foster? require?
5. What kinds of creative thinking do employers want? (And should this matter?)
6. How does creative thinking relate to problem solving (PS)?
7. What kinds of "problems" require creative solutions?
8. Can we/How can we effectively teach creative thinking & PS?
9. Can we/How can we effectively assess creative thinking & PS?
10. _____(your question)

Directed Paraphrasing

In 1 or 2 brief sentences, describe or define what creative thinking looks like when your students do it well – or what it would look like if they could do it well – by the end of a course you teach or program you lead.

Creative Thinking . . .

_____

_____

_____

Some key terms and concepts that might be of use

- Extrinsic and intrinsic motivation
- Deliberate practice
- Generativity
- Variations
- Closure
- Simple, Complicated, Complex and Super-complex problems
- Analogies
- Algorithms
- Concept maps
- Portfolios

Applications Card

DIRECTIONS: Please take a moment to recall and list the ideas, techniques, and strategies we've discussed – and those you've thought up – to this point in the session.

Interesting IDEAS/TECHNIQUES from this session	***Some possible APPLICATIONS of those ideas/techniques to my work***

A Few Possibly Useful References on Creativity and Innovation

Ariely, D. (2012). *The (Honest) Truth about Dishonesty: How We Lie to Everyone – Especially Ourselves.* New York: HarperCollins.

Burkus, D. (2014). *The Myths of Creativity: The Truth about How Innovative Companies and People Generate Great Ideas.* San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1996). *Creativity: Flow and the Psychology of Discovery and Invention.* New York: HarperCollins.

Daly, S.R., Mosyjowski, E.A. & Seifert, C.M. (2014). Teaching creativity in engineering courses. *Journal of Engineering Education,* 103(3), 417-449.

DeHaan, R.L. (2009). Teaching creativity and inventive problem solving in science. *CBE-Life Sciences Education, 8*, 172-181.

Ericsson, K.A., Krampe, R.T. & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363-406.

Kaufman, J.C. & Sternberg, R.J. (2010). *The Cambridge Handbook of Creativity.* New York: Cambridge U. Press.

Kruger, J. & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence leads to inflated self-assessments. *Journal of Personality and Social Psychology*, 77(6), 1121-1134.

Ness, R.B. (2011). Teaching creativity and innovative thinking in medicine and the health sciences. *Academic Medicine, 86*(10), 1201-1203

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Sawyer, R.K. (2012). *Explaining Creativity: The Science of Human Innovation.* New York: Oxford U. Press.

Space for Creative Thinking & Innovation . . .