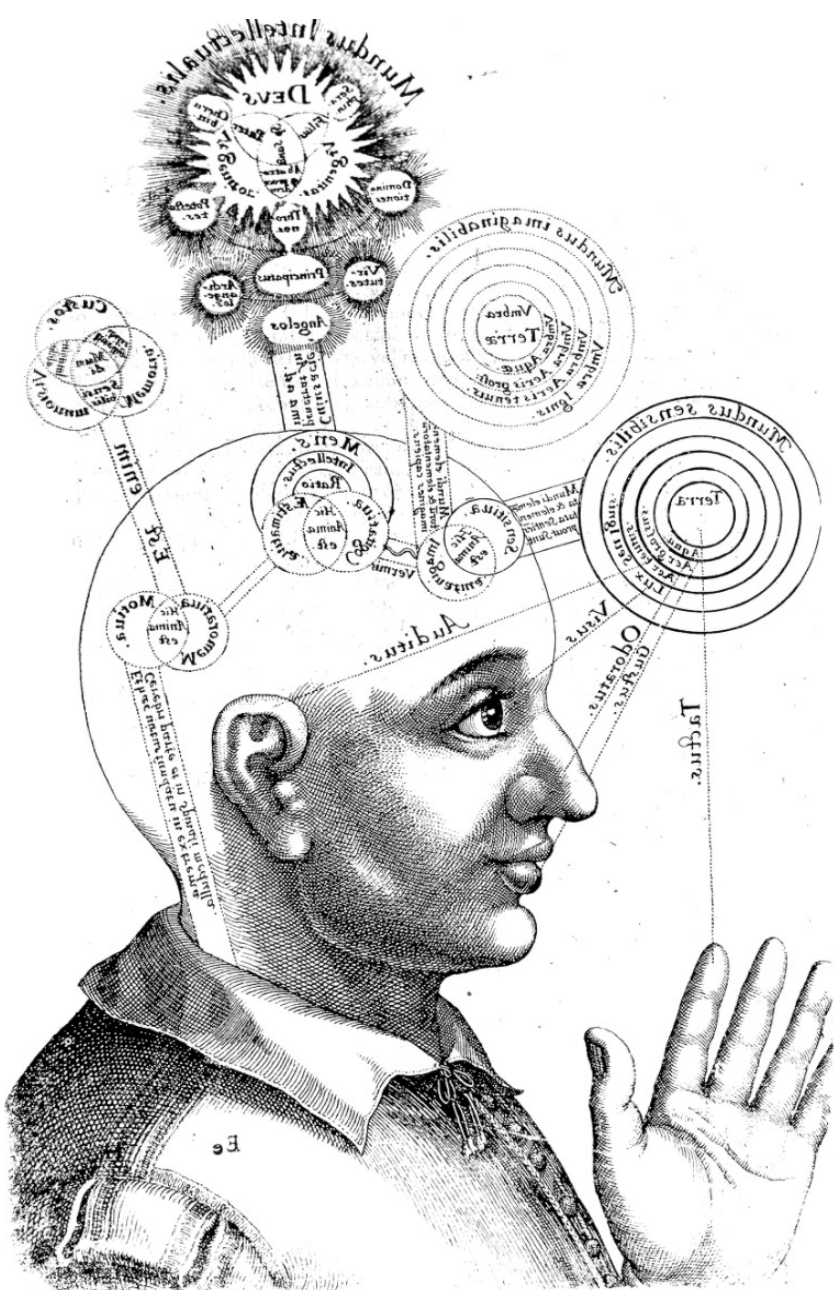


LEARNING SCIENCE AND PEDAGOGY FOR CREATIVITY

PATRICIA KUCKER

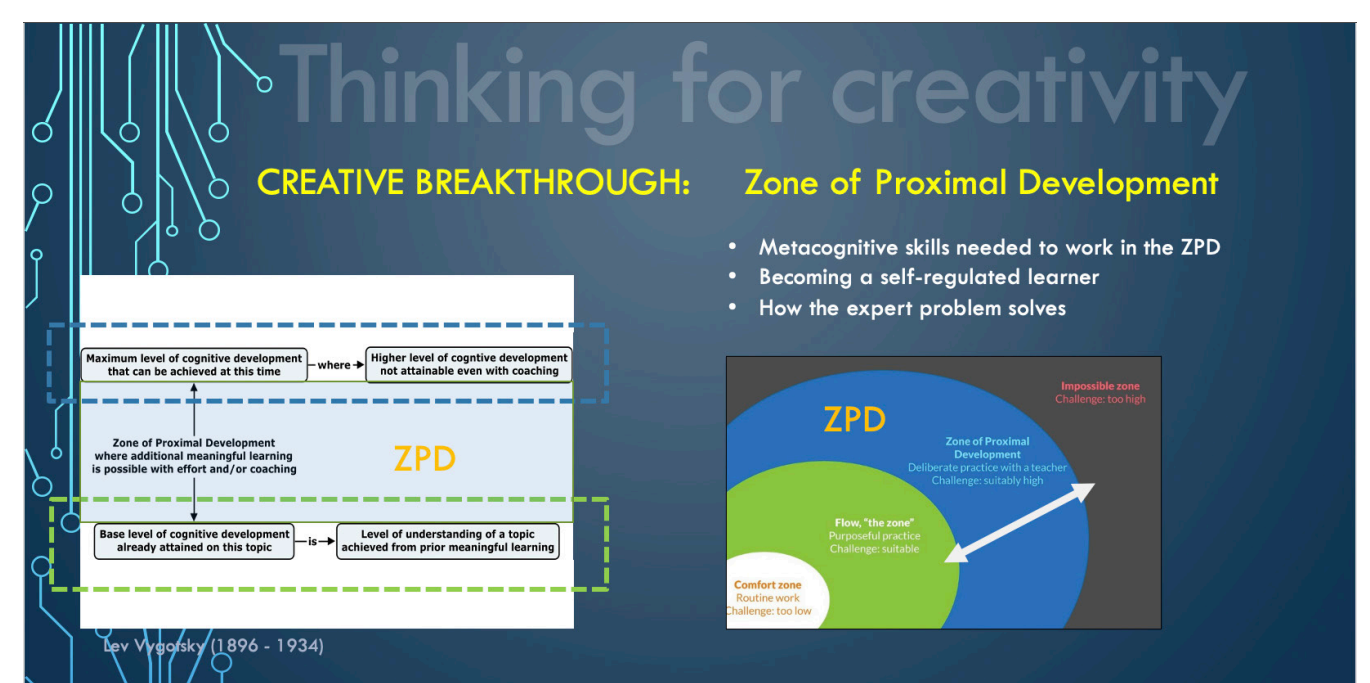
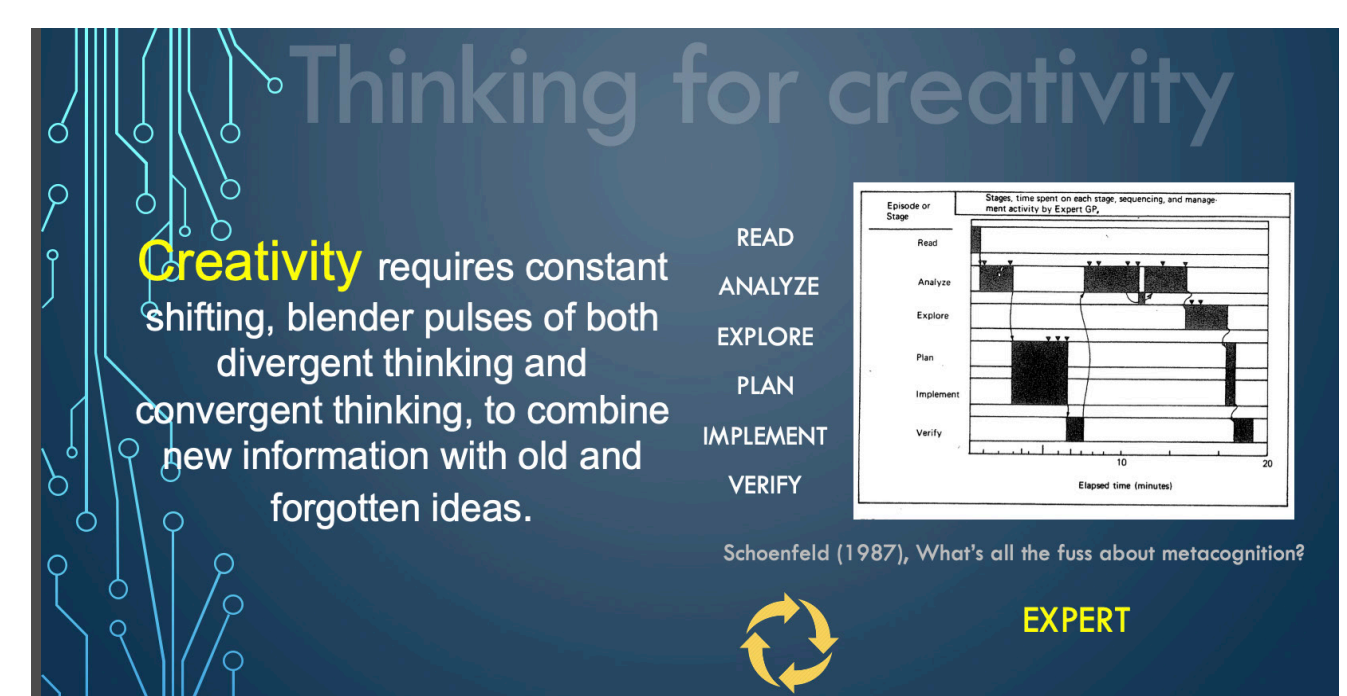
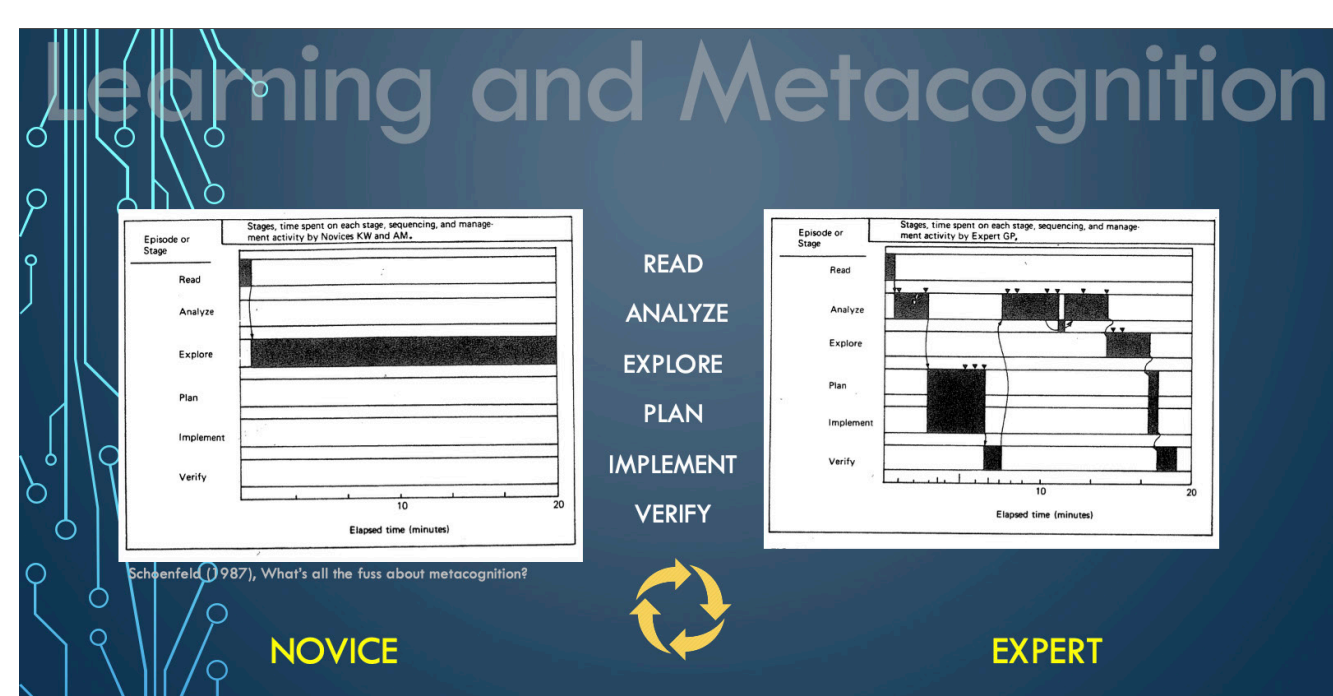
Nurturing and developing creative skills and expanding a student's creative capacity is the hallmark of learning experiences in the Penn State College of Arts and Architecture. What is creativity and how do we teach it? To answer this question, scholars, psychologists, educators, and neuroscientists have been discussing and defining the construct of creativity for more than 60 years. This study seeks to explore the theories of creative cognition and learning science to develop a framework for analyzing current, and developing new, pedagogical practices for creativity in art and design.



FLUDDS DIAGRAM OF THE MIND, Image credit:
Utriusque Cosmi, Tom. II, Tract. I, Lib. X

Creativity has been a topic of discussion and of research in the field of psychology for approximately 60 years. Psychology is the parent discipline of education, and education often takes its definitions from psychology. Psychology, which is the scientific study of mental operations and behavior, asks, "What makes people creative? How can creativity be enhanced? What happens in the mind while a person is creating? What are the conditions for creative production? What inhibits creative production? What does the social setting contribute to creativity? Is creativity a solitary or community activity?" All of these, and more, are questions psychologists have sought to study with regard to creativity. Creativity research in psychology considers four interrelated streams: the process, product, person, and the environmental influences (Piirto, 2011).

Creativity and human creative behavior is rooted in cognition (Runco, 2014, Bass, et.al, 2015). Cognition refers to the mental processes involved in gaining knowledge and comprehension. Research in the field of cognition focuses on thinking skills and intellectual processes, such as higher order skills for learning that include judgement, perception, planning, and memory.



Images are from a lecture titled: CREATIVE COGNITION. The lecture presented connections between metacognition and creative problem solving behaviors. Image credit: Patricia Kucker

For students in the creative fields of design and the fine and performing arts, their college education is defined by a learning experience that relies on cycles of reflexivity to execute creative solutions to complex and ill-defined problems, or to develop an artistic body of work that is compelling to the eye, ear, and emotions. This educational journey requires developing personal awareness, motivation for critical inquiry, goal-oriented behavior, and perseverance. These essential behaviors are a framework for attaining disciplinary knowledge and a prerequisite for cultivating creativity. As educators in the college, we are accomplished creative practitioners but few of us are trained to be teachers. Few are trained to teach students to be creative.

There are fertile connections between basic cognitive and metacognitive processes, and information processing and creative problem-solving, as well as connections with intelligence, judgement, and language development (Runco, 2014). The field of creative cognition is multi-disciplinary and offers schema for understanding the cognitive processes underlying the range of human creativity.

This study is focused first on a literature review for 'creative cognition' to articulate and inform pedagogical practices. This review includes the early work of Spearman, Guilford, Torrance, and Mednick, with a focus on the contemporary scholar and psychologist Mark Runco, Ph.D. Runco's research has led to the componential theory of creative cognition that takes into account the multi-stage stage and flexible cognitive processes for creative problem-solving. In addition, this study will identify evidence-based research for pedagogical practices in art and design that target the development of creativity. Furthermore, this study seeks to connect the model of creative thinking present in learning science to new pedagogies for art and design education. Dr. Marcela Borge, College of Education, may be a good partner to include as her work focuses on cognition, learning and design. <https://ed.psu.edu/directory/mbs15>.

Baas, M., Nijstad, B. A., and De Dreu, C. K. W. (2015). Editorial: "The cognitive, emotional and neural correlates of creativity." *Front. Hum. Neurosci.* 9:275. doi: 10.3389/fnhum.2015.00275

Csikszentmihalyi, M. (1999). "Implications of a systems perspective for the study of creativity," in *Handbook of Creativity*, ed. R. J. Sternberg (New York, NY: Cambridge University Press), 313–335.

Kaufman, J. C., & Sternberg, R. J. (Eds.). (2010). *The Cambridge handbook of creativity*. Cambridge University Press.

Kozbelt, A., Beghetto, R. A., & Runco, M. A. (2010). *Theories of creativity*.

Piirto, J. (2011). Creativity for 21st century skills. In *Creativity for 21st Century Skills* (pp. 1-12). -SensePublishers.

Runco, M. A. (2014). *Creativity: Theories and themes: Research, development, and practice*. Elsevier.



PennState
College of Arts and Architecture