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Developing creativity, motivation, and self-actualization with learning systems

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Abstract

Developing learning experiences that facilitate self-actualization and creativity is among the most important goals of our society in preparation for the future. To facilitate deep understanding of a new concept, to facilitate learning, learners must have the opportunity to develop multiple and flexible perspectives. The process of becoming an expert involves failure, as well as the ability to understand failure and the motivation to move onward. Meta-cognitive awareness and personal strategies can play a role in developing an individual's ability to persevere through failure, and combat other diluting influences. Awareness and reflective technologies can be instrumental in developing a meta-cognitive ability to make conscious and unconscious decisions about engagement that will ultimately enhance learning, expertise, creativity, and self-actualization. This paper will review diverse perspectives from psychology, engineering, education, and computer science to present opportunities to enhance creativity, motivation, and self-actualization in learning systems.

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Keywords: Creativity; Learning systems; Psychology; Failure; Motivation

Education has the dual power to cultivate and to stifle creativity. Recognition of its complex tasks in this domain is one of the most fruitful intellectual achievements of modern psychopedagogical research.

Edgar Faure (Learning to Be, Unesco, Paris 1972)

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1. Introduction

This paper starts off with a discussion of the synergies between the arguments of several leading experts on creativity, education and educational technology, and psychology with respect to creativity, motivation, and self-actualization. After establishing this basis, it extends a discussion of the role of personal ownership, imagination, and analogy in the development of “multiple points of view,” an ability widely regarded as essential to learning and becoming expert. Hybrid human–computer systems and the concept of Meta-Creativity are then discussed, highlighting the opportunities they present to develop complementary psychological, cognitive, and computational strategies, enhancing both human and computer capabilities, particularly in creative and self-actualized pursuits. The next section addresses motivation and failure and how computers can be employed by designers, educators, and learners to welcome difficulty, failure, and challenge to develop experience and expertise. The paper then closes with a series of recent psychological findings, both positive and negative, on the topics of motivation, affect, optimal experience, creativity, procrastination, and interruption. These are seen as instrumental to the realization of learning systems that strive to foster self-actualization.

2. Self-actualization, learning and creativity: a synergistic cycle

Self-actualization, “the desire to become more and more what one is, to become everything that one is capable of becoming” (Goble, 1970), as stated in Abraham Maslow’s theory of basic needs, is fundamentally equivalent to the goals for education, learning environments, and creativity, espoused by notable educators and psychologists: Teresa Amabile, Mihaly Csikszentmihalyi, Edgar Faure, Alan Kay, Seymour Papert, and Paul Torrance. These goals emphasize learning in relation to creativity, incubation, play, imagination, analogy, flexibility, optimal experience, joy, well-being, and adequate challenge. There is agreement not only that learning and creativity are essential to self-actualization, but also that self-awareness, intrinsic motivation, and self-actualization are fundamental to learning and creativity as well: there is a synergistic cycle. In the following paragraphs I will summarize relevant contributions of each of the aforementioned individuals.

Amabile has created a social psychology and computational model of creativity. Her structure includes three components within the individual: intrinsic motivation, domain-relevant knowledge, and creative skills, alongside a fourth environmental component encompassing the external setting, extrinsic motivation and rewards, social interactions, and time pressure. Although the definition of creativity is frequently debated there is some consensus that it deals with a “process” which results in a “novel” and “useful product,” in the most general sense of these words. Amabile argues that, while a person is engaged in activity, the greater the individual’s intrinsic motivation; facility with and access to domain-relevant knowledge; and creative skills; and the more the environment is supportive through resources, information, actualizing rewards, volunteering, freedom, and

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