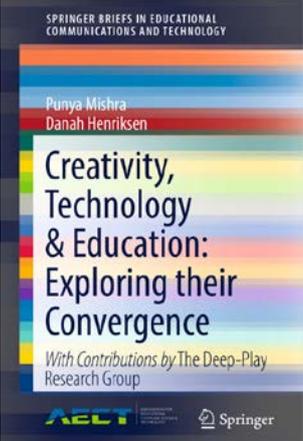


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# **FOSTERING A MIND-SET OF CREATIVITY IN EDUCATION: A REVIEW OF *CREATIVITY, TECHNOLOGY & EDUCATION: EXPLORING THEIR CONVERGENCE*.**

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<p><b>CREATIVITY, TECHNOLOGY &amp; EDUCATION: EXPLORING THEIR CONVERGENCE</b></p> <p><b>Editors:</b> Mishra &amp; Henriksen</p> <p><b>Publisher:</b> Springer</p> <p>Mishra, P., &amp; Henriksen, D. (2018). <i>Creativity, technology &amp; education: exploring their convergence</i>. Springer.</p>	
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## **REVIEW**

The impulses, easily identified in children, to communicate, inquire, construct and express themselves with the world around them underpin the urge to learn in all ages. John Dewey identified these impulses as central to how pedagogical strategies should be tailored for learners. However, in the century since Dewey expressed his ideas the domain, fields, and tools of education have become crowded in how to tap into the impulses that drive learning. Punya Mishra, Danah Henriksen and their colleagues in the Deep-Play Research Group, a group of faculty and students from Michigan State and Arizona State Universities, address the challenge educators face when developing educational strategies. Their illuminating work, *Creativity, Technology & Education: Exploring their Convergence (2018)*, offers a new perspective of creativity, the creative process, technology in education and how these can be wielded and focused by educators and learners alike. Where the work is found lacking is the grounding in empirical findings, theoretical underpinnings for newly introduced concepts of (in)disciplined learning and deep convergence, a paucity of specific examples in education and technologies employed. Despite these shortcomings, the work offers educators a concise perspective to heuristically promote students' use of creativity and technology allowing them to own their learning experience.

The twelve essays in four sections attempt to reframe, redefine, and in some cases introduce new concepts that provide new insight for educators to promote creativity and technology in educational contexts. The theme woven through these essays is the need for a deep and wide variety of knowledge and varied experiences, which are vital to the ability to come up with creative possibilities and exploit the tools of learning. For educators attempting to foster these in young learners or learners with limited subject knowledge this could prove difficult and self-

defeating. However, the authors adequately address this dilemma by emphasizing the use of trans-disciplinary cognitive skills of perceiving, patterning, abstracting, embodied thinking, modelling, play, and synthesis and the introduction of the new concept of (in)disciplined learning. Both must be nurtured and manipulated in an educator-learner partnership to develop new insights, solve problems and transfer information creatively.

### *Deconstructing the myths surrounding creativity*

The deconstruction of the myths and perceptions surrounding creativity and technology in education is the subject of the first section of the book. Dispelling the “chrono-centric” conceit that technological tools should drive the conceptualization of teaching and learning is first challenged. Readers are encouraged to utilize technological tools to stimulate different cognitive skills to satisfy the “what” and “how” of content delivery. An excellent example is of elementary school students using motion-sensing technology to discuss college level algebra mathematical functions through an abstraction of their own physicality as they moved around the room. Second, the authors dismantle the notion of teaching creativity in a content neutral way. This is clearly evidenced from the necessity of creativity in all fields. Yet creativity manifests differently for each field from mathematics, art, and science to business.

In place of the deconstructed myths, the authors offer up the NEW (Novel, Effective, Whole) definition for creativity of a goal-driven process for developing solutions that are novel, effective and whole. This offers the tantalizing possibility of developing a rubric to measure what we value, in this case creativity, and not assign values to what is easily measured. Unfortunately, the authors go no further than offering hints on their research methods in developing such a valuable tool. As for technology tools, the multiplying and evolving influence of social media and digital learning are opportunities for educators to capitalize on. Drawing upon Csikszentmihalyi’s (1997) systems view of creativity that creativity lies in the interaction between the individual, domain, and field in which the creative work is developed, the authors conclude that the distance between the creator and the audience has now reached zero. Gatekeepers, in this case educators, no longer have the same role in disseminating information and should instead evolve with technology into influencers. The one example of YouTube in the text illustrates how educators can repurpose social media to fit pedagogical and disciplinary learning goals. Though linkages between the tools utilized and the cognitive skills actuated are not identified.

### *A new definition of creativity*

The second section of three essays attempts to address the contradiction that the creative process requires deep disciplinary knowledge and the ability to transfer creative ideas across disciplinary boundaries. The concept of (in)disciplined learning is posited. The view holds that the creative process occurs within a specific context, and this process is distinct between contexts or disciplines. While simultaneously, the process is not confined by context to encompass imagination and divergent thinking. In order to bridge this divide, trans-disciplinary cognitive skills are put forward as a path for educators. It is the challenge for educators and learners alike is to make connections between the different contexts through the use of content, tools and activating differing combinations of trans-disciplinary skills. The last two essays offer insight in how (in)disciplined learning occurs through relating the breakthroughs of innovators such as Charles Darwin, Mark Twain, Alexander Fleming, Steve Jobs and an in-depth consideration of the Rubik’s cube.

The main deficiency of this section, which serves as the crux of the book, is that no framework is proposed for (in)disciplined learning. The addition of the label (in)disciplined can serve to succinctly identify widely known patterns of behaviour of famous innovators, however carries no weight without a framework to examine or implement such behaviour. The value in identifying this deficiency is for educators and learners alike to experiment with the content, tools, and cognitive skills to incite novel, effective and whole (NEW) creative thinking in learners to aid them in achieving their educational goals. Action research in this domain would serve to develop the concept of (in)disciplined learning.

### *The creative process of creative people*

The third section describes in detail personal creative process experiences in three fields: engineering, computational thinking and mathematics. The common thread among the personal experiences discussed is how the in-depth knowledge of these individuals was informed, inspired and motivated by ideas and concepts from their other disciplines. For example, Steve Jobs' engineering prowess being inspired by his sense of aesthetics and calligraphy, and Manful Bhargava's mathematics influenced by his music highlight the concept of (in)disciplined learning. One powerful example is Christopher Carlson's computational thinking experience. Combining his expertise in computational tools and his passion for design, he designed parameters for corporate logos. Then employed a computational thinking system (a tool) to manipulate the parameters and design the logos. The parameters of the new designs would then be refined by Carlson and re-manipulated by the tool. The creative solutions were thus the product of the partnership of human intuition and agency with an advanced tool's algorithmic problem solving and abstractive reasoning. From the detailed personal accounts the reader can partially deduce the trans-disciplinary skills employed by these innovators to transfer ideas from one discipline to another to generate creative solutions. The experiences are illuminating due to the disparate disciplines from which ideas are exchanged and how the individual interacts with their domain and field to spur creativity.

### *The convergence of creativity, technology and education*

The fourth section explores the architecture of user-driven learning spaces and the authors' ideas on the convergence of creativity, technology and education to contemplate how humans develop meaning for themselves and the world around them. The first two essays detail models of user-driven learning spaces, their design and architecture. The revelation of how each model was being subverted by the users was intriguing. Users sought novel, effective and whole solutions to exploit the learning space and facilitate their needs. The functionality of user-driven learning spaces is identified a dependant on how sensitively and flexibly designed they are to seamlessly produce the contextual environment that learners experience in real world interactions. Further, a balance of chaos and order is noted to be essential in the learning space to encourage experimentation, problem solving, and collaboration with content and technological tools.

Lastly, the uncertainty of the influence the convergence of creativity, technology and education will have on society, called deep convergence, is reflected upon. Instead of speculating, the authors call for new frames of thinking and research as the convergence of these three factors has accelerated in digital, pedagogical and societal domains. From only a decade ago, digital convergence has revolutionized the reach of individuals, firms and governments to communicate, interact, and explore through the now ubiquity of smart devices. Similarly, pedagogies are challenged as the how and what to learn by necessity is changing with the

limitless exposure to information and the relentless pace of innovation. Lastly, individual and societal behavioural norms have been altered, as the forms of communication, interaction, cooperation and even psychology have become unstable and unpredictable. The ripple effects and consequences of trivialities now spread beyond the furthest imagination generating senses of excitement, fear, mystery and anxiety to the users and creators of these same convergences.

It is here, the ragged edge of creativity, technology and education where Punya Mishra and Danah Henriksen's book leaves us. In their words, it is a first draft that will be filled in not only by them but others who will take up the challenge. The work succeeds in laying out new perspectives on creativity, technology, education and their convergence. The value to educators and learners is in the application of the insights revealed. With plentiful examples of the application and manipulation of creative processes and technology provided throughout the twelve essays. Readers can also discover opportunities for action research from within the theoretical shortfalls and lack of empirical findings. The limited cases in the field of education presented limit in some respects the value of this work. In summation, the work is worthwhile and easily accessible for all readers with an interest in education, innovation processes and technology in the classroom. Additionally, for exploratory or experimentally minded educators, this work has the potential to offer innovative educational strategies, educational objectives and classroom activities to foster creativity within the minds of their students as they seek to achieve their educational goals.

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