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The Case for Creativity in Higher Education: Preparing Students for Life and Work in the 21st Century

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Abstract

In order to be successful in a world shaped by volatility, uncertainty, complexity, and ambiguity, students must be skilled in creative thinking. However, *creative thinking* has not enjoyed the same pedagogical attention in higher education as has the skill of *critical thinking*. In this article, the authors explore the role of higher education, the importance of creative thinking as an indispensable life skill, the history of creative and critical thinking as dual educational components, the definition of creativity as a trainable ability, and the reasons why creativity must be assertively implemented in university and college curricula and environments. Case studies of universities that have fully operationalized creative education in the United States, Canada, and Colombia are explored, as well as the efforts to promote creativity within fourteen universities ranked among the world's top fifty.

Keywords: *creativity, creative studies, higher education, VUCA world, critical thinking*

INTRODUCTION

> "For the past 25 years, we have optimized our organizations for efficiency and quality. Over the next quarter century, we must optimize our entire society for innovation."
>
> (National Center on Education and the Economy, 2008, p. 25)

As noted in the opening quote, the world is at an inflexion point. The role higher education plays in that societal optimization, in our opinion, can arguably be synthesized into one goal: to prepare students for future success. By *success*, we mean achieving intrinsic and extrinsic goals both personally and professionally. In other words, and in the most ideal sense, students attend a college or university not just to receive a piece of paper formalizing the number of years they have attended or a transcript to document academic performance, but rather, to be better prepared to be successful in the world they are about to enter as adults. As our world continues on its path of economic, geopolitical, technological, and social change, success will be realized, as noted by the National Center on Education and Economy, by those who are creative. As their report argued, "Creativity, innovation, and flexibility will not be the special province of the elite. It will be demanded of virtually everyone who is making a decent living, from graphic artists to assembly line workers, from insurance brokers to home builders" (National Center on Education and

Table 1: Skills on the Rise and on the Decline in the 21st Century Workplace

Skills on the rise (Trending, 2022)		Skills on the decline (Declining, 2022)	
1	Analytical thinking and innovation	1	Manual dexterity, endurance and precision
2	Active learning and learning strategies	2	Memory, verbal, auditory and spatial abilities
3	Creativity, originality and initiative	3	Management of financial, material resources
4	Technology design and programming	4	Technology installation and maintenance
5	Critical thinking and analysis	5	Reading, writing, math and active listening
6	Complex problem-solving	6	Management of personnel
7	Leadership and social influence	7	Quality control and safety awareness
8	Emotional intelligence	8	Coordination and time management
9	Reasoning, problem-solving and ideation	9	Visual, auditory and speech abilities
10	Systems analysis and evaluation	10	Technology use, monitoring and control

Source: World Economic Forum (2018). The future of jobs report. Geneva, Switzerland: World Economic Forum. Retrieved on October 20, 2019 from http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf

the Economy, 2008, p. 25).

THE ROLE OF HIGHER EDUCATION

For institutions of higher education to best prepare students for future success, it is imperative that they understand the context into which they are sending their students. Mass public education has its roots in the industrial revolution where students were trained to take part in a labor force as either skilled workers or as managers (Florida, 2014). However, our world has evolved, and our times have changed. We are no longer preparing students for an economy and society dominated by industrialization, a world characterized by stability, predictability, and disciplined repetition. Instead, we are preparing students for life and work in an era driven by innovation, which the World Economic Forum (2018) referred to as the fourth industrial revolution. This is a world that is characterized by volatility, uncertainty, complexity, and ambiguity. As such, there is wide recognition that the skills necessary to be successful in the 21st century are substantially different from those that contributed to success in the 20th century. Table 1, based on the World Economic Forum's 2018 *The Future of Jobs Report*, provides an excellent summary of how 21st century skills are overtaking 20th century skills.

The skills noted as being on decline in Table 1 are primarily 20th century skills which were appropriate for a labor-centric society. In sharp contrast, the skills on the rise are reflective of the 20th century economy and world. Yunus (2017) eloquently summarized the contrast between the 20th and 21st centuries when he argued that past educational practices prepared students to become job seekers, while today it is incumbent on educational systems to train students to become job creators. With this new economy in mind, the reader will note that both critical and creative thinking are viewed as skills that are on the rise (see left column in Table 1). Like two distinct threads, critical and creative thinking are woven throughout the skills that the World Economic Forum argued are on the ascent and will be in great demand by the year 2022. With respect to critical thinking, this skill is specifically called out in set #5 in Table 1 (Critical thinking and analysis). What is striking about the World Economic Forum's analysis of workplace skills is the degree to which creativity and creativity-related skills are coming to the fore. As seen in Table 1, creativity is specifically highlighted as the third most important skill for professional success by the year 2022 (#3 Creativity, originality, and initiative). Moreover, closer inspection of these top ten growth skills shows creativity is embedded in a number of places in this list. For instance, Puccio, Mance, and Murdock (2011) have specifically described how creativity supports Complex problem-solving (see item #6), Leadership and social influence (see item #7), and Reasoning, problem-solving, and ideation (item #9). Critical and creative thinking do not work in isolation. These are integrated skills and the top ten list provided by the World Economic

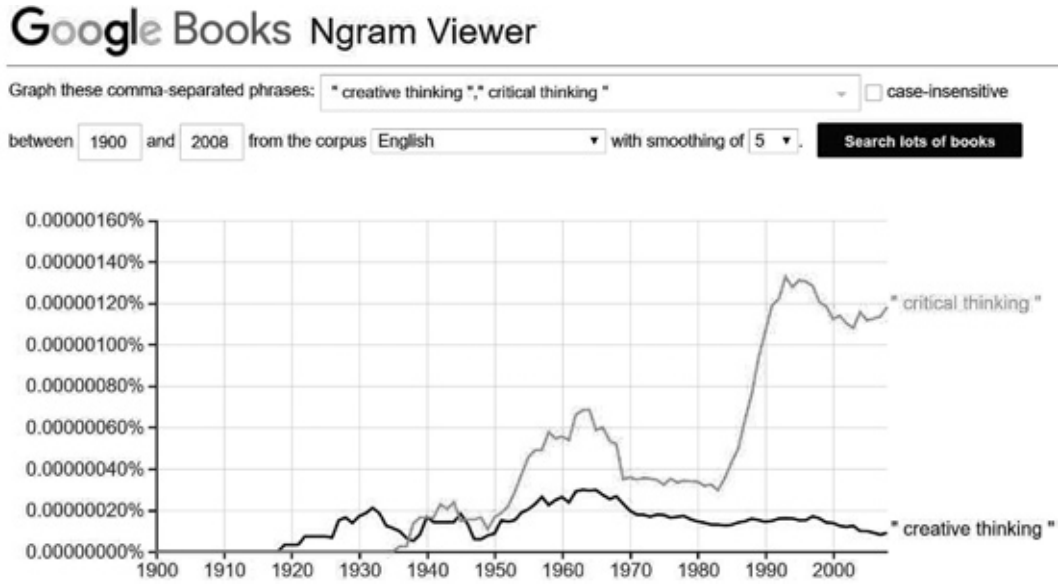

Figure 1: Google Ngram Viewer of Critical Thinking and Creative Thinking

Forum reinforces the symbiotic relationship between critical and creative thinking. Notably, the most crucial skill set for 2022, #1 Analytical thinking and innovation, emphasizes the union between critical and creative thinking, respectively.

There is no more important goal than for universities to prepare students for success in life and work. The World Economic Forum's list is useful in assisting university and college leaders to understand the current context and, consequently, the skills necessary for success in the early part of the 21st century. As stated above, we believe that both critical and creative thinking are tantamount for 21st century success; however, where critical thinking seems to be of longstanding concern for universities and colleges, creative thinking is an emergent concept. As a construct that is relatively new in the world of higher education, the purpose of the present paper is threefold. First, to make a case for the importance of creativity in higher education. Second, to define and describe creativity and creative thinking. Third, to provide examples of how universities and colleges can promote creative thinking among their students.

THE IMPORTANCE OF CREATIVITY IN HIGHER EDUCATION

Critical and Creative Thinking

While universities need to develop both critical and creative-thinking skills among their students, it is our contention that there is a greater emphasis, and broader acceptance, of critical thinking in institutions of higher education. An analysis of the terms "creative thinking" and "critical thinking" in Google's Ngram Viewer illustrates the popularity of these concepts. Google's Ngram Viewer tracks occurrences of words in printed texts (for the methodology of data collection used to produce Google's Ngram Viewer, see Michel et al., 2011). The analysis below tracks the occurrences of the two bi-grams from 1900 to the present day in a repository of books printed predominantly in the English language in any country, with a smoothing of 5, meaning the results are averaged over the span of a five-year period. The graph in Figure 1 shows that *creative thinking* emerges as a concept just before the 1920s. *Critical thinking* appears much later, around the mid-1930s. However, *critical thinking* is quick to overtake *creative thinking* starting in the 1940s.

A brief historical review is necessary to

understand the adoption of these terms over time. In the 1930s, 30 schools in the United States took part in the "Eight Year Study," an effort put forth by a newly formed Commission on the Relation of School and College to examine mass public education in the United States over the three decades since the turn of the century and consider how it might be improved to better prepare students for the world. During the time at which this commission was founded, only three out of six students who entered high school graduated, and of those three, only one would go on for higher education. After a one-year review by the commission, several weaknesses were identified in the school system that gave them a framework around which to base their longitudinal study in which 30 schools were invited to experiment with their curriculum. Interestingly, one of the weaknesses identified was that "...the creative energies of students were seldom released and developed" (Akin, 1942, p. 6). Critical thinking was not mentioned in the weaknesses outlined in the beginning of this report, but later, one of the 30 schools that participated stated that they placed a strong emphasis on the development of critical thinking in their students. The Stanford Encyclopedia of Philosophy summarizes the history of critical thinking—that after the Eight Year Study of the Progressive Education Association, critical thinking became the subject of research (Arnold, 1938), led to the development of measures, and ultimately was incorporated into Bloom's first taxonomy of cognitive educational objectives (Hitchcock, 2018). Of contradictory salience, however, is that while critical thinking seemed to grow in popularity and importance after this study, creativity did not enjoy such attention, despite the following call to action featured at the end of the report—a directive that schools should provide for the:

> Release of creative energies: through experience and training in various arts, including both practice and appreciation… through the encouragement, in all work, of independent, individual thinking and of fresh combining of thought; through providing opportunities for guidance, for young people to exercise their desire to do something "on their own" (ex: tinkering, inventing, constructing, special pursuits in reading, instrumental music) (Akin, 1942, p. 145).

Figure 1 shows several more spikes which provide dramatic evidence for the widening gap between critical and creative thinking. According to this Ngram analysis, interest in critical thinking jumped, especially when compared to creative thinking, in the mid-1950s, the mid-1960s, and then a sizeable leap occurred in 1990. Throughout this time frame, *creative thinking* remains fairly static, lagging well behind the growing interest in *critical thinking*. More recently, Runco (2007) has argued that most educational practices are focused on *critical thinking* and do very little to promote such *creative thinking* skills as divergent thinking, which is the ability to generate many, varied, and original responses to an open-ended challenge. When economic and societal forces of the 20th century are taken into account, the gap between critical and creative thinking can be understood. However, given the widespread call for creativity in the 21st century, as noted above and by Puccio's (2017) review of 21st century workplace reports, it might be expected that the divide between critical and creative thinking would wane in light of contemporary workplace needs.

Critical thinking, to be sure, is a valuable cognitive skill; however, of equal value is the ability to think and solve problems *creatively*. The lack of emphasis on this skill in general, and specifically in higher education, is problematic given the world into which new graduates are entering.

CURRENT CONTEXT: STUDENTS ENTERING A VUCA WORLD AND THE RISE OF THE CREATIVE CLASS

Since the late 1980s, the United States Army War College has incorporated the acronym "VUCA" into its pedagogy (U.S. Army Heritage and Education Center, 2018). Standing for "Volatility, Uncertainty, Complexity, and Ambiguity," VUCA encapsulates the notion that students should be appropriately prepared to survive and thrive in environments where current situations are not analogous to past experience and future outcomes are difficult to predict. VUCA has since become prevalent in organizational and leadership language (see Bennett & Lemoine, 2014; Lawrence, 2013), and more recently,

is finding applications with respect to higher education (see Waller, et al., 2019).

The *volatility* faced by today's higher education student can be seen by the rate at which information becomes outdated. For instance, an earlier World Economic Report (2016) indicated that 50% of content a student in a technological field learns in his or her first year of university study is out of date by the time the student reaches his or her final year of degree work. In a 2006 paper, IBM reported that where knowledge had doubled every 25 years or so in the 20th century, in the 21st century knowledge doubles at a rate of every 11 hours.

Uncertainty can be seen in the current job market in which new graduates seek employment. While the job market for 2019 graduates is currently strong, there is uncertainty in the types of jobs that will be available for students in the future. For example, a 2017 report published by the Institute for the Future and Dell Technologies stated that an estimated 85% of the jobs that current-day students will have in 2030 have not been invented yet. The report goes on to describe an environment experienced by 2030 workers that will be characterized by "In-the-Moment Learning":

> ...it's clear that, by 2030, workers will create new work infrastructures to acquire the skills and knowledge they will need to execute their work successfully. They will routinely improvise, learn from each other, and make their own way. Some will rely on past work experiences, frameworks, or mental models. Others will experiment across different platforms, discovering their own workarounds and pioneering their own innovations (Institute for the Future & Dell Technologies, 2017, p. 16).

This study illustrates the uncertainty today's students face, and it also provides support for the fact that students need to learn how to be adaptable, how to think like problem-solvers, and how to be creative. They must be trained, as the study above implies, to be *pioneers*.

Shaffer and Zalewski (2011) specifically invoke the VUCA concept as they cite all the factors that contribute *complexity* to the current state of the economy. They name the rate of globalization, economic instability, population growth, environmental issues, intercultural communication, and technological change as issues that add layers of intricacy and solution multiplicity to the world of work that students will enter (Shaffer & Zalewski, 2011).

Ambiguity is the direct result of the confusion that arises from the previous factors of volatility, uncertainty, and complexity. Digitalization is changing the rules of everything from mass communication to employment. A 2013 study conducted by Frey and Osborne concluded that roughly 40% of current jobs will become automated in the very near future. Their analysis of those jobs that will be most resistant to automation possess two key characteristics: social skills and imagination.

Where Frey and Osborne's (2013) study highlights the impact of technological advances on future work, Florida's work underscores the significant changes in the nature of the labor force that are currently underway. Florida described the paradigm shift from the orderly, linear, homogeneously clustered world of the earlier half of the 20th century to that of our contemporary society driven by creative impulse—the rise of what Florida dubbed the Creative Class. Florida posited that "creativity—'the ability to create meaningful new forms,' as Webster's dictionary puts it—has become the decisive source of competitive advantage" (Florida, 2014, p. 6). Whereas the Working and Service Classes, by Florida's definition, are paid for physical work, the Creative Class is paid for skilled application of their cognitive and social abilities. In other words, they are paid to use their minds to produce novel solutions. However, as the name of his book suggests, this creative class is still on the rise; we are currently in the midst of a seismic societal shift from one mindset—of raw productivity rooted in the Industrial Age—to another entirely new mindset. Florida stated that one of the keys to bridging this gap is to intentionally foster creativity in our education system.

A PERFECT STORM: THE GAP BETWEEN THE CREATIVITY DEMAND IN SOCIETY AND THE CREATIVITY PROVISION IN EDUCATION

A 'perfect storm' is a particularly violent weather

Table 2: Bloom's Revised Taxonomy of Thinking

Level	Cognitive Process Dimension	
6.0	Create: Putting elements together to form a novel, coherent whole or make an original product	
	6.1	Generating
	6.2	Planning
	6.3	Producing
5.0	Evaluate: Making judgments based on criteria and standards	
	5.1	Checking
	5.2	Critiquing
4.0	Analyze: Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose	
	4.1	Differentiating
	4.2	Organizing
	4.3	Attributing
3.0	Apply: Carrying out or using a procedure in a given situation	
	3.1	Executing
	3.2	Implementing
2.0	Understand: Determining the meaning of instructional messages, including oral, written, and graphic communication	
	2.1	Interpreting
	2.2	Exemplifying
	2.3	Classifying
	2.4	Summarizing
	2.5	Inferring
	2.6	Comparing
	2.7	Explaining
1.0	Remember: Retrieving relevant knowledge from long-term memory	
	1.1	Recognizing
	1.2	Recalling

Source: Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. Theory into practice, 41(4), 212-218.

event that arises from a rare combination of adverse meteorological variables. Today, we believe society is facing a perfect storm relative to creativity. While creativity is in demand, it would seem that educational, organizational, and societal pressures are undermining the degree to which individuals can develop and express their creativity. This perfect storm is particularly evident when one compares the current demand for creativity with the degree to which educational practices attend to creativity. Bloom's well-known taxonomy of thinking, in which thinking skills are organized from lower to higher order, was revised at the beginning of the 21st century (see Table 2) to better reflect life in the 21st century. In the previous version, Evaluation, a skill more in keeping with critical thinking, was considered to be the most complex form of human thought. As can be seen in the revised taxonomy, creative thinking has assumed the highest form of human cognition. With that in mind, it would seem natural that university leaders and educators would aim to develop students' thinking to the highest level achievable by humans.

Sadly, Florida (2014), among others, believes our current educational system is broken. Robinson and Aronica (2015) detailed the Industrial Revolution roots of mass education, in which society needed to train its youth en masse to be effective workers. Since more workers were needed than managers, schooling was structured like a pyramid, with the numbers of students who progressed up the levels from grade school to graduate school

thinning out. This system espoused the principles of compliance, conformity, and a linear progression of knowledge. Today, that system has grown into one that is consumed with standardization of knowledge, from the Common Core in the United States to the proliferation of time- and resource-consuming standardized testing in school systems worldwide. Robinson and Aronica call out an educational system that is designed around standardized testing: "If you design a system to do something specific, don't be surprised if it does it. If you run an education system based on standardization and conformity that suppresses individuality, imagination, and creativity, don't be surprised if that's what it does" (Robinson & Aronica, 2015, p. xx).

Robinson and Aronica (2015) called for an infusion of creative teaching and creative learning as a critical step toward improving today's U.S. education system. In his popular 2006 TED Talk, Robinson stated, "Creativity now is as important in education as literacy, and we should treat it with the same status." However, educational practices seem to be lagging behind.

The need for educational systems to pay greater attention to creativity is not limited to the U.S. In a 2010 study in which teachers in schools across 32 European countries were surveyed, Cachia and Ferrari found that while the belief that creativity was important and cross-disciplinary, there was a discrepancy between what teachers believed and what they put into practice. The authors argued for the institutionalization of creative practices, and called for the reform of educational policy to require training in how to foster creativity in educational systems (Cachia & Ferrari, 2010). In Canada a 2015 survey of university faculty members showed that while 87.8% of faculty felt creativity was important, only 45.9% included creativity in their student learning outcomes (Marquis & Henderson, 2015).

Cachia and Ferrari (2010) proposed that part of the issue related to the dearth of creativity in education might be connected to a lack of understanding what creativity is and how it can be implemented in the classroom. Cachia and Ferrari (2010) stated that creative practices in education need to go beyond "learning how to learn" (p. 9) and embrace other activities instrumental to creative learning, such as play and multidisciplinary work. They raised the following call to action:

> We also argue that policy-makers and teachers should have an understanding of what creativity is, what it implies for education, and how it can be applied in practice. This should be stated and promoted through curricula, teacher training, and good practices exchange. (Cachia & Ferrari, 2010, p. 10)

Adobe has conducted a series of international surveys to examine the demand for creativity and the extent to which educational systems promote creative thinking. The findings provided by a 2012 global study conducted by Adobe revealed that a majority of employees, 59% on average, believed that their past educational experiences stifled their creative potential (62% in the US, 61% in the UK, 59% in Germany, 62% in France, 51% in Japan). A study conducted a year later with K-higher education faculty and parents highlighted the key barriers to creativity among educational institutions (Adobe, 2013). The top three reasons cited by the US sample were: system too reliant on testing, educators restricted from straying outside of the curriculum, and lack of resources. For the international research participants (UK, Germany, and Australia), the major barriers to creativity in education were: the current educational curriculum, the misunderstanding of the importance of creativity in education, and lack of resources combined with educators not able to stray outside of the curriculum.

The analyses described above underscore the gap between the demand for creativity and the degree to which educational practices engage students in the development of creative potential. To this end, let us examine what creativity is, the role it plays in education, and how educators are currently putting it into practice.

WHAT IS CREATIVITY?

So, what is creativity? In order to define what creativity is, it is imperative to examine what it is *not*. Fox and Fox (2010) outlined four myths about creativity: 1) mystery, 2) magic, 3) madness, and 4) merriment.

Creativity is *not* shrouded in mystery. It has been studied for well over fifty years with academic programs and centers dedicated to both creativity

research and creativity education. Creativity is *not* synonymous with magic. It is not something that is gifted to some people and not others; in fact, creativity is innate to all human beings and is a competency that is teachable and learnable. Despite the popular perception that one must suffer from mental disorders to be creative, while the relationship between creativity and mental health is complex, it is simply *not* accurate to conclude that one must be mad to be creative. To the contrary, creativity has been cited as a sign of a healthy mind (Rogers, 1952). Finally, while creativity and levity often go hand-in-hand, creativity is *not* just "fun and games." To be sure, creativity involves playfulness and imagination, but at the same time it is serious work to the bottom-line success of an organization and society as a whole (Florida, 2014; Toynbee, 1964). Creativity is novelty and adaptation; creativity is evolution.

Creativity is not an unknowable force that is gifted to some lucky few individuals; rather, creativity is a trainable skill. Consider the following three definitions of creativity:

1. Creativity in problem solving and planning is the ability of a subject in a choice situation to modify self-imposed constraints (Ackoff & Vergara, 1988, p. 87);
2. Creativity is… the ability to bring new and valuable things into being (Nielsen & Thurber, 2016; p. 17);
3. Creativity [is] the ability to generate new ideas and to apply them in practice (Robinson, & Aronica, 2015; p. 136).

Creativity is, above all else, an *ability*. Abilities can be taught, and abilities can be learned. Having established the importance of creative ability as a skill necessary for a VUCA world, it is now useful to examine case examples in which creativity and creative thinking have been successfully embedded within universities and colleges.

SUCCESSFUL IMPLEMENTATION OF CREATIVITY PROGRAMS IN HIGHER EDUCATION: CASE EXAMPLES FROM SUNY BUFFALO STATE (USA), SHERIDAN COLLEGE (CANADA), AND UNAB (COLOMBIA)

It is important, first and foremost, to recognize that creativity is an ability that can be taught, and that studies have shown the efficacy of creativity training. The fact that creative training produces measurable results in organizational settings has been well-researched and well-documented (e.g. Puccio, Firestien, Coyle & Masucci, 2006; Puccio et. al, 2018) and was the subject of an intensive meta-analysis undertaken by Scott, Leritz and Mumford in 2004, the results of which indicated that across the 70 prior studies analyzed, gains in creativity training programs are generalizable across criteria, settings, and target applications.

A study conducted over the course of two years and published in 1976 details the effects of creativity training in a university setting. In this study, 145 incoming first-year college students were enrolled in four creative studies courses each semester for two years. For comparison purposes, students in the control group (n = 153) did not enroll in creative studies courses over the same time period. Both groups took tests derived from Guilford's Structure-of-Intellect categories at the conclusion of each of the four semesters of the study. The results of the study indicated that the training in creativity had significantly improved participants' abilities in idea-generation, idea assessment based on judgment criteria, as well as idea implementation strategy (Reese, Treffinger, Parnes & Kaltsounis, 1976).

To illustrate the successful implementation of creativity training, three case studies are presented for consideration: 1) International Center for Studies in Creativity at SUNY Buffalo State in the United States, 2) Sheridan College in Ontario, Canada, and 3) Universidad Autónoma de Bucaramanga, Colombia.

THE INTERNATIONAL CENTER FOR STUDIES IN CREATIVITY (ICSC) AT SUNY BUFFALO STATE, USA

In 1953 Osborn published his seminal book *Applied Imagination: Principles and Procedures of Creative Problem Solving*. As indicated by the title of this popular book, Osborn was one of the first ever experts in applied creativity methodologies. In this seminal book Osborn introduced and described cognitive strategies he had fashioned and tested

over decades through experiences gained primarily in his advertising agency. Although Osborn was steeped in business applications of creativity, he recognized the crucial role education played in preparing people for success in life and work. So strong were his convictions that education needed to do a better job at enhancing creative thinking, that post his business career he dedicated the remainder of his life to promoting creativity in education. Between his retirement from the advertising agency he founded and his death, Osborn established the Creative Education Foundation, initiated the first ever conference on creativity (the Creative Problem Solving Institute which still runs today), facilitated perhaps the first ever university courses on creativity at the State University of New York (SUNY) at Buffalo, and collaborated with researchers to test the efficacy of his methodologies.

In 1967 Osborn's main academic collaborator, Dr. Sidney Parnes, along with Dr. Ruth Noller, left the University of Buffalo and moved their fledgling creativity program to SUNY Buffalo State. Given the profound and positive results of a two-year empirical study into the effectiveness of undergraduate courses in creativity (Reese, Treffinger, Parnes & Kaltsounis, 1976), Drs. Parnes and Noller were invited to establish a permanent academic department focused solely on teaching and studying creativity. Now more than 50 years later, SUNY Buffalo State boasts the longest running academic program in the field of creativity.

This unique academic program blends an applied approach to creativity with an interest in creativity research. This dual focus has resulted in numerous academic publications, including studies focused on the impact of their undergraduate and graduate creativity courses (Firestien & McCowan, 1988; Puccio, et al., 2018; Puccio, Firestien, Coyle & Masucci, 2006; Puccio, Keller Mathers, Acar & Acar Cayirdag, 2016). The International Center for Studies in Creativity, within the Department for Creativity and Change Leadership, offers both undergraduate and graduate programs. At the undergraduate level bachelor's degree students can earn a minor in Creativity Studies and another in Leadership Studies. Both of these areas of concentration assist students in developing the kinds of 21st century skills that will help them to be even more effective in their chosen fields of work and to standout in the marketplace as they compete for jobs. The Creativity Studies program attracts students from all degree programs but is most popular with those in Business Studies, Communication, and Psychology. The 18-credit hour Creativity Studies minor features five required courses in Creative Problem Solving, small-group facilitation, creative approaches to leadership, innovation, and a general survey of the field of creativity. The leadership program is also an 18-credit hour program of which four courses are required. The core required courses are Foundations of Leadership, Creative Approaches to Problem Solving, Creative Leadership through Effective Facilitation, and Experiences in Leadership.

At the graduate level the International Center for Studies in Creativity offers an 18-credit hour graduate certificate in Creativity and Change Leadership and a 33-credit hour Master of Science degree. The department's graduate program attracts students from a diverse range of fields: primary school to higher education, business, technology, not-for-profit, legal profession, medical, design, and the faith-based community. The overall graduate curriculum is organized into four categories of courses: the *knowledge* strand which focuses on creativity theories and models; the *imagination* strand which focuses on applied creativity methodologies; the *evaluation* strand which focuses on scholarship in the field; and the *attitude* strand which focuses on creative approaches to leadership.

To date, more than 700 students have earned the State University of New York graduate certificate in Creativity and Change Leadership and Master's degrees in Creativity Studies. It is not uncommon for these graduate students, which was reinforced by a recent survey of alumni, to describe their educational experience as transformative. To review recent empirical investigations of the impact of the graduate program on students see Puccio et al. (2018) and Puccio et al. (2016).

SHERIDAN COLLEGE, ONTARIO, CANADA

Sheridan College, formally known as The Sheridan

College Institute of Technology and Learning, has done something that no postsecondary institution has done relative to creativity education. This multi-campus college with more than 20,000 full-time students has successfully institutionalized creativity. Around 2012, Sheridan College embarked on a new strategic plan with the primary goal of becoming a creative campus. Sheridan's creative campus initiative included a number of elements. The main emphasis was to impart 21st century skills by infusing creativity into their discipline-based courses, as well as to offer courses that specialized in the topic of creativity. A second element was to develop the creative-thinking skills and knowledge of faculty so that they might better promote creative thinking and creative problem solving as learning outcomes in their courses. And the third aspect of the creative campus initiative was to infuse creative thinking and problem-solving strategies and mindsets into the daily operations of the college.

With respect to direct participation on the part of students in creativity courses, since 2012 Sheridan has enrolled over 3,000 students in a general elective course called Creative Thinking: Theory and Practice. In 2014 Sheridan began offering a series of creativity courses that culminates in an undergraduate board approved certificate in Creativity and Creative Problem Solving. To date nearly 200 students have completed the sequence of five courses earning this undergraduate certificate. Since this set of certificate creativity courses were launched in 2014, well over 6,500 students have enrolled in these courses.

To promote creativity outside of the specific courses described above, Sheridan has embarked on a professional development program that has involved more than 300 faculty, staff, and administrators. This four-tiered program features a three-day foundational workshop in Creative Problem Solving, a one-day workshop focused on embedding creativity content and skills into courses, a multi-day program in small group facilitation, and an advanced program in creativity training.

Sheridan College is a shining example of how creativity can be internalized at an institutional level. The creativity content and work at Sheridan is embedded across degree programs and specifically within their creativity certificate. And students enrolled in diploma programs, who are not eligible to participate in the creativity certificate, are able to take the general elective course. The use of Creative Problem Solving and other deliberate creativity methodologies have become so pervasive among students, that Sheridan students are now providing services to the campus and the community in which they facilitate and deploy deliberate creativity methodologies to tackle serious issues. For a description of Sheridan's creative campus initiative, and an investigation of the impact of this initiative on the organizational mindset, see Preece, Katz, Richards, Puccio and Acar (2017).

UNIVERSITY AUTÓNOMA DE BUCARAMANGA, COLOMBIA

The Universidad Autónoma de Bucaramanga (UNAB), a private, non-profit university in Bucaramanga, Colombia has become the first fully creative campus in Latin America. What started as an idea for an online program outside of the university grew, through collaboration and shared vision, into a culture change at the systemic level with the aim of revolutionizing the university's approach to higher education.

Through a collaboration with the ICSC at SUNY Buffalo State, a process developed from the Four P's of Creativity and inspired by the model adopted by Sheridan College was initiated to operationalize the vision of an organizational design that would promote creative thinking in all aspects of UNAB's operations. The Four P's of Creativity, coined by creativity scholar Mel Rhodes (1961) set a framework for the understanding of creativity, and provided a holistic approach to the changes sought by UNAB. *Person* identifies the habits and attitudes that promote creative thought and behavior. *Process* applies to motivation, perception, and communication about creativity as an approach. *Press* assesses the development of an environment conducive to creativity. Finally, *Product* is the final stage of metamorphosis of an idea into a tangible form (Rhodes, 1961). These Four P's are evident in UNAB's strategic plan, seen in Figure 2, and explained below.

UNAB staff, faculty, and students at the undergraduate and graduate level represent the People of the Four P's model. Staff at all levels in

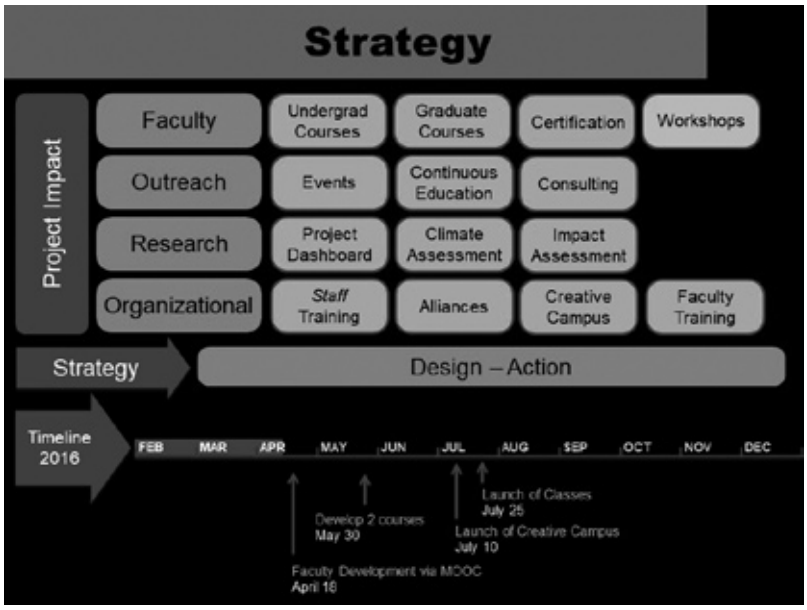

Figure 2: The strategic plan for creativity implementation at the Universidad Autónoma de Bucaramanga (UNAB), Bucaramanga, Colombia

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the university are involved in creative thinking workshops to develop skills and apply tools that promote an open mindset toward innovation. Faculty teach an assortment of creativity courses (including a course in creative studies that is required for all undergraduate students), workshops in creative problem solving, team-building for innovation, design thinking, and other creative processes. They also transform existing courses using the Torrance Incubation Model (TIM) to deliver profession- or discipline-related content while developing creative skills within their students (for more information on TIM, see Torrance, 1990). Through these courses and workshops, students are encouraged to "design their creative life," an initiative that embraces self-development, reignites the creativity that is often stifled through linear, algorithmic thinking, and aids students in identifying and removing their own self-imposed constraints.

The outreach aspect of the culture change strategy represents the creative Process. From the university's strategic planning to the way research proposals are created and executed, the academic community uses creative thinking to get the most innovative possible outcomes from these key activities. The university also hosts creativity events that are open to the community, continuous education for community members interested in professional development in principles of creative problem solving, and consulting opportunities that connect faculty with outside organizations ranging from local government to regional conferences.

UNAB's creative Product is represented in new courses and academic programs, workshops, and consulting activities designed to promote economic and social impact to the community, and research projects geared toward potential innovations. These Products are assessed through UNAB's research strategy. A project dashboard was designed to quantify the creative output in the form of research being conducted within the university. Regular culture assessments (similar to those conducted by Sheridan College) provide feedback on the aspiration to become a creative campus. UNAB also conducts impact assessments by regularly measuring course evaluations for student feedback, following up on faculty's consulting efforts, and other measurements of the overall effect of the creative campus.

Finally, creative Press, or environment, is seen at the physical and psychological level. UNAB

classrooms have been structured to promote collaboration and the development of creative skills. Creative Press is also seen in organizational training initiatives. Faculty follow the Sheridan approach of four levels of training—Level 1 consists of a three-day program that teaches the Creative Problem Solving (CPS) *FourSight* Model (for more information on the CPS *FourSight* Model, see Grivas & Puccio, 2012). Level 2 teaches the Torrance Incubation Model (TIM) of teaching and learning. Level 3 involves facilitation training, and Level 4 consists of the design and delivery of a course on creativity. University staff are invited to take on any of the levels of the training they wish. Branding of the campus as the first fully designated creative campus in Latin America is well underway through the launch of UNAB Creative—Centro de Creatividad, Innovación & Emprendimiento; Center of Creativity, Innovation & Entrepreneurship.

Since its implementation in 2016, UNAB Creative has served 1,077 UNAB students and has impacted over 25,000 individuals within the university and in the surrounding community through their workshops and courses (Reporte Docencia Creative, 2019). Additionally, UNAB has launched a successful new satellite campus, AURA Creative, in the capital city of Bogotá. All students at the satellite campus enroll in a Principles of Creative Problem Solving course, and the campus features the only creative studies library in Latin America (AURA Creative, 2019; J. F. Cabra, personal communication, November 14–18, 2019). Through these initiatives, UNAB is making tremendous strides in igniting creativity in the region.

The above three cases are the best examples that we know of in which institutions in higher education have committed to creative education as a strategic imperative at the institution's organizational level. However, it is also inspirational to note that other universities around the world are also taking measures to operationalize creativity in their curricula.

EXAMPLES OF CREATIVITY INITIATIVES AMONG THE TOP FIFTY UNIVERSITIES IN THE WORLD

Creativity is touted as an important enough skill to earn its way into mission statements of top universities. The authors compiled a list of the top fifty universities in the world, as ranked by the Center for World University Rankings (CWUR; Center for World University Rankings, 2019; for methodology see Mahassen, 2019). A content analysis of the mission statements of these universities showed that the words *creative thinking*, *creativity*, or similar iterations appeared in fourteen out of the fifty available statements, with *innovation* or *novelty* appearing in seven of these fifty statements. The words *critical thinking* or similar iterations appeared in seven of the fifty statements.

The fourteen institutions that mentioned *creativity*, or some iteration thereof, are presented in Appendix A. The schools are listed in the rank-order as obtained from CWUR, and the mission statement is listed either in full, or where indicated, abridged to show the creativity-related terms. The authors were interested to learn how these schools operationalized the creativity aspect of their missions. Upon further investigation, some exciting initiatives in creativity were evident.

Massachusetts Institute of Technology houses a Learning Creative Learning online course and community organized by the Lifelong Kindergarten group at the MIT Media Lab (Learning Creative Learning, 2019). Stanford University has created d.school, a cross-disciplinary program providing project-based and experiential classes in design thinking (d.school, 2019). Educational Innovation at the University of Wisconsin-Madison is a pedagogical initiative to "engage and inspire students through enriched learning" (Educational Innovation, 2019). The University of Texas at Austin offers a nineteen-hour certification program in Innovation, Creativity and Entrepreneurship through its Bridging Disciplines Programs (Texas Undergraduate Studies, 2019). The University of North Carolina at Chapel Hill has launched Creativity Hubs, cross-disciplinary virtual research networks that promote discovery, risk-seeking and curiosity in research (Creativity Hubs, 2019). At the University of Edinburgh, the Festival of Creative Learning is a series of programs that promote creative learning practices, and foster the values of openness, collaboration, creativity, mindfulness, and experimentation (Festival of Creative Learning,

2019). The Washington University in St. Louis offers an interdisciplinary first-year only course called "Designing Creativity: Innovation Across Disciplines" that explores the creative process through guest speakers, team collaboration, and project presentation (Designing Creativity, 2019). The Curb Center Creative Campus Initiative at Vanderbilt University supports the combined expertise of students, faculty, and staff with the goal of infusing the university with creativity through course innovation, experiential encounters throughout the campus, and facilitating conversations that focus on generating ideas and solving problems that benefit the community (Creative Campus, 2019).

This is not intended to be an exhaustive list; rather, it serves to show how creativity seems to be at the forefront of consideration of many institutions of higher learning – and one might hope that in the not-so-distant future, that even greater focus is given to this essential skillset, that more universities and colleges follow in this trend, that these initiatives grow to be operationalized at an all-encompassing, organizational level, and that creativity begins to see the same attention and focused energy that critical thinking has seen these decades past.

CONCLUDING VISION AND GOALS GOING FORWARD

In 1987 McDonough and McDonough reported on a national survey of American colleges and universities to determine how many offered courses specifically in creativity as a subject. Of the 1,188 institutions that responded to their survey, 76 were found to offer a formal course on creativity. That is roughly 6% of the responding institutions. In the mid-1980s the demand for creativity was not nearly as pervasive as it is today. In light of the universal call for creativity as a 21st century skill, it would be interesting to replicate the McDonough and McDonough (1987) study. One would hope that the percentage of formal courses in creativity offered at universities and colleges has ticked up. However, given the analysis of the use of the terms creative thinking and critical thinking shared earlier, in which creative thinking was seen to lag well behind the degree to which the phrase critical thinking is invoked, it might be safe to assume that subject of creativity is far from universally addressed by colleges and universities.

As noted earlier, we now live in a VUCA world. A world defined by change, driven by innovation, and beset by complex problems. The very survival of our species relies on, as it was ever thus, an ability to successfully apply creative thinking. And more than ever before, the generation of students who are transitioning into their adult years require creativity abilities to thrive in their professional and personal lives. The challenges associated with a VUCA world know no boundaries. It is not particular to Eastern or Western cultures, developed or developing countries, poor or wealthy strata within society, white- or blue-collar jobs, and private or public sector firms. In our highly integrated world, the implications of a VUCA world are truly global.

What is equally global is education. It is our firm belief that universities and colleges must do better to equip students with the creative-thinking skills so necessary in today's VUCA environment. It is the job of universities and colleges to prepare young people for future success. Therefore, it is incumbent upon institutions of higher education to call on, challenge, and cultivate the creative talents of students. There should be creativity courses, creativity content, and creativity professors at every university and college in the world. There is no excuse not to embed creativity in the academic world. There is a sufficient number of valid and useful creativity theories, models, and methodologies to deploy within university curricula. Universities and colleges must supplant the idea that they are preparing students for a job and career with the idea that they are preparing students for a lifetime of change. In today's world, content has a short shelf life, but creativity skills are forever.

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Appendix A: Mission Statements Containing "Creativity" or Similar Terms from the CWUR List of Top 50 Universities

UNIVERSITY NAME	MISSION STATEMENT
Massachusetts Institute of Technology	The mission of MIT is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century. The Institute is committed to generating, disseminating and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges. MIT is dedicated to providing its students with an education that combines rigorous academic study and the excitement of discovery with the support and intellectual stimulation of a diverse campus community. We seek to develop in each member of the MIT community the ability and passion for working wisely, creatively, and effectively for the betterment of humankind.
Stanford University	Research: Extend the frontiers of knowledge, stimulate creativity, and solve real-world problems. Education: Prepare students to think broadly, deeply and critically, and to contribute to the world. Service: Deploy Stanford's strengths to benefit our region, country and world.
California Institute of Technology	The mission of the California Institute of Technology is to expand human knowledge and benefit society through research integrated with education. We investigate the most challenging, fundamental problems in science and technology in a singularly collegial, interdisciplinary atmosphere, while educating outstanding students to become creative members of society.
University of California, Los Angeles	EXCERPT: Discovery, creativity and innovation are hallmarks of UCLA. As one of the world's great research universities, we are committed to ensuring excellence across a wide range of disciplines, professions and arts while also encouraging investigation across disciplinary boundaries. In so doing, UCLA advances knowledge, addresses pressing societal needs and creates a university enriched by diverse perspectives where all individuals can flourish.
University of Washington–Seattle	The primary mission of the University of Washington is the preservation, advancement, and dissemination of knowledge. The University preserves knowledge through its libraries and collections, its courses, and the scholarship of its faculty. It advances new knowledge through many forms of research, inquiry and discussion; and disseminates it through the classroom and the laboratory, scholarly exchanges, creative practice, international education, and public service. As one of the nation's outstanding teaching and research institutions, the University is committed to maintaining an environment for objectivity and imaginative inquiry and for the original scholarship and research that ensure the production of new knowledge in the free exchange of facts, theories, and ideas.

UNIVERSITY NAME	MISSION STATEMENT
University of Wisconsin–Madison	The primary purpose of the University of Wisconsin–Madison is to provide a learning environment in which faculty, staff and students can discover, examine critically, preserve and transmit the knowledge, wisdom and values that will help ensure the survival of this and future generations and improve the quality of life for all. The university seeks to help students to develop an understanding and appreciation for the complex cultural and physical worlds in which they live and to realize their highest potential of intellectual, physical and human development. It also seeks to attract and serve students from diverse social, economic and ethnic backgrounds and to be sensitive and responsive to those groups which have been underserved by higher education. To fulfill its mission, the university must: Offer broad and balanced academic programs that are mutually reinforcing and emphasize high quality and creative instruction at the undergraduate, graduate, professional and postgraduate levels. Generate new knowledge through a broad array of scholarly, research and creative endeavors, which provide a foundation for dealing with the immediate and long-range needs of society. Achieve leadership in each discipline, strengthen interdisciplinary studies, and pioneer new fields of learning. Serve society through coordinated statewide outreach programs that meet continuing educational needs in accordance with the university's designated land-grant status. Participate extensively in statewide, national and international programs and encourage others in the University of Wisconsin System, at other educational institutions and in state, national and international organizations to seek benefit from the university's unique educational resources, such as faculty and staff expertise, libraries, archives, museums and research facilities. Strengthen cultural understanding through opportunities to study languages, cultures, the arts and the implications of social, political, economic and technological change and through encouragement of study, research and service off campus and abroad. Maintain a level of excellence and standards in all programs that will give them statewide, national and international significance. Embody, through its policies and programs, respect for, and commitment to, the ideals of a pluralistic, multiracial, open and democratic society.
University of California San Diego	UC San Diego is transforming California and a diverse global society by educating, by generating and disseminating knowledge and creative works, and by engaging in public service.
University of Texas at Austin	The mission of The University of Texas at Austin is to achieve excellence in the interrelated areas of undergraduate education, graduate education, research and public service. The university provides superior and comprehensive educational opportunities at the baccalaureate through doctoral and special professional educational levels. The university contributes to the advancement of society through research, creative activity, scholarly inquiry and the development and dissemination of new knowledge, including the commercialization of University discoveries. The university preserves and promotes the arts, benefits the state's economy, serves the citizens through public programs and provides other public service.
University of North Carolina at Chapel Hill	Our mission is to serve as a center for research, scholarship, and creativity and to teach a diverse community of undergraduate, graduate, and professional students to become the next generation of leaders. Through the efforts of our exceptional faculty and staff, and with generous support from North Carolina's citizens, we invest our knowledge and resources to enhance access to learning and to foster the success and prosperity of each rising generation. We also extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life for all people in the State. With lux, libertas—light and liberty—as its founding principles, the University has charted a bold course of leading change to improve society and to help solve the world's greatest problems.

UNIVERSITY NAME	MISSION STATEMENT
University of Edinburgh	One of the four aims in the University's mission statement is to 'enable our graduates and staff to be exceptional individuals equipped to address global challenges'. The University's Strategic Plan highlights some of the key steps in supporting this mission. We will: be a place for independent, creative and critical thinkers to develop as innovators, researchers and explorers have a full understanding of our students' needs and opportunities enabling them to explore their interests within and beyond their degree programmes make available personal and professional development opportunities for staff and students educate the next generation of leaders and influencers enable our students to fulfil their full potential, regardless of where they come from, with increased financial and pastoral support. We will create opportunities for our students to exchange ideas, share their values and shape the world in which they live expand student and staff opportunities: embed community engagement within our degree programmes, creating opportunities for students to work, volunteer or study within a community setting recognise the value of engagement and social responsibility through the Edinburgh Award for students, credits for experiential learning in degree programmes ensure that our degree programmes remain current and support student employability seek employers' input to course content and degree programme development and delivery provide meaningful work-related learning for students, including placements with companies, industry co-sponsorship of doctoral degrees, and paid internships ensure that graduates are equipped with the abilities and commercial skills that employers need, through digital and data-related learning opportunities.
University of Minnesota–Twin Cities	EXCERPT: Research and Discovery—To generate and preserve knowledge, understanding, and creativity by conducting high-quality research, scholarship, and artistic activity that benefit students,scholars, and communities across the state, the nation, and the world.
Washington University in St. Louis	EXCERPT: to encourage faculty and students to be bold, independent, and creative thinkers
Vanderbilt University	Vanderbilt University is a center for scholarly research, informed and creative teaching, and service to the community and society at large. Vanderbilt will uphold the highest standards and be a leader in the quest for new knowledge through scholarship, dissemination of knowledge through teaching and outreach, and creative experimentation of ideas and concepts. In pursuit of these goals, Vanderbilt values most highly intellectual freedom that supports open inquiry, equality, compassion, and excellence in all endeavors.
Pennsylvania State University	The Pennsylvania State University is a multi-campus, land-grant, public research University that educates students from around the world, and supports individuals and communities through integrated programs of teaching, research, and service. Our instructional mission includes undergraduate, graduate, professional, continuing, and extension education, offered through both resident instruction and distance learning. Our educational programs are enriched by the talent, knowledge, diversity, creativity, and teaching and research acumen of our faculty, students, and staff. Our discovery-oriented, collaborative, and interdisciplinary research and scholarship promote human and economic development, global understanding, and advancement in professional practice through the expansion of knowledge and its applications in the natural and applied sciences, social and behavioral sciences, engineering, technology, arts and humanities, and myriad professions. As Pennsylvania's land-grant university, we provide unparalleled access to education and public service to support the citizens of the Commonwealth and beyond. We engage in collaborative activities with private sector, educational, and governmental partners worldwide to generate, integrate, apply, and disseminate knowledge that is valuable to society.

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