

Handbook of Research on

# Creative Problem-Solving Skill Development in Higher Education



Chunfang Zhou



# Handbook of Research on Creative Problem–Solving Skill Development in Higher Education

Chunfang Zhou  
*Aalborg University, Denmark*

A volume in the Advances in Higher Education  
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## Chapter 9

# International Center for Studies in Creativity: Curricular Overview and Impact of Instruction on the Creative Problem– Solving Attitudes of Graduate Students

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### **ABSTRACT**

*This chapter provides an overview of the programs offered by the International Center for Studies in Creativity (ICSC) at Buffalo State, State University of New York, where creativity is taught and studied extensively at the graduate and undergraduate level. Following the discussion on creativity as a 21<sup>st</sup> century skill and perennial need for creativity in the workforce, programs and courses are introduced along with the historical roots and philosophy of creativity at ICSC. The Creative Problem Solving Model, which represents the core of the curriculum, is described. The chapter also presents the results of the study regarding the impact of the graduate program on the creative problem solving attitudes of the graduate students based on qualitative and quantitative data.*

### **INTRODUCTION**

Creativity has been perceived as an elusive and complex construct (Brown, 1989; Ford & Harris, 1992; Sternberg, 2006). The content we present in this chapter centers on creativity, however, it is quite tangible. We will present information about programs and curricula focused on the development of creativity and provide empirical evidence showing impact of such creativity programs. More specifically, such creativity models as Creative Problem Solving: The Thinking Skills Model is described as the theoretical underpinnings are briefly discussed.

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## ***International Center for Studies in Creativity***

The creativity courses and programs offered at the International Center for Studies in Creativity (ICSC) have been developed over the decades are founded on certain beliefs about creativity. We believe that:

- Creativity is a crucial life skill that helps individuals and societies survive, grow, and prosper.
- Everybody has creative potential although its expressions can vary both in degree and style.
- Creativity can be cultivated, developed, and taught.

The current chapter aims to explain and present:

- Creativity as high demand 21<sup>st</sup> century skill.
- The mission and history of the ICSC.
- Programs offered by ICSC and curricular overview.
- Results of the qualitative and quantitative data collected from graduate students.

## **BACKGROUND**

### **Life in the 21<sup>st</sup> Century: The Age of Innovation**

It seems every generation claims that theirs is a time of change. For example, in the mid-1970s Rollo May (1975) observed in his classic book *The Courage to Create*:

*Every profession can and does require some creative courage. In our day, technology and engineering, diplomacy, business, and certainly teaching, all of these professions and scores of others are in the midst of radical change and require courageous persons to appreciate and direct this change. (p. 22)*

While each successive generation can legitimately claim that they lived in a time of increased change, it is no stretch of the imagination to say that life in the early part of the 21<sup>st</sup> century has ushered in unprecedented levels of change. The exponential rate of change is easily seen in the time it takes humans to double the amount of available knowledge. American futurist, designer and inventor, Buckminster Fuller (1981) famously calculated that all of the information accumulated by human kind up to year one of the modern calendars had doubled in the successive 1500 years, that is by the beginning of the 1500's. It then took a short 250 years for knowledge to double again, between 1500 and 1750. Picking up the pace, it was estimated that human knowledge then doubled in 150 years from 1750 to 1900. The amount of time it took for information to double dropped then to approximately every 25 years from the beginning to the middle of the 20<sup>th</sup> century. In a world driven by technology, the rate at which accumulated knowledge doubles is now a dizzying 11 hours (IBM, 2006).

Calculations in regard to the time it takes for knowledge to double can feel a bit abstract. Let's look at the speed of change that may have a more direct impact on our households, that is the time it takes products we use on a daily basis to become obsolete. Evidence for the increase in the pace of change becomes readily apparent when one examines the duration of product life cycles, which is typically described as Introduction, Growth, Maturity, and, finally, Decline. In the first half of the 20<sup>th</sup> century it took more than a decade for the following well-known products to move just from Introduction to the Growth stage: dishwashers (59 years), steam irons (14 years), power lawn mowers (16 years), garbage

disposals (20 years), and automatic coffee makers (14 years). In the latter part of the same century the duration from the point of commercialization to growth had been significantly reduced. For example, all of the following product categories moved from introduction to growth in under five years: cellular phones (3 years), CD players (2 years), camcorders (1 year), and direct broadcast satellites (5 years) (Golder & Tellis, 2004). And in 2014 five years represented the full life expectancy, from adoption to obsolescence, most consumers associated with electronic goods (i.e., televisions, smartphones, laptops, etc.) (Ely, 2014).

The short life expectancy associated with products in today's marketplace means that companies must release new products at an ever-faster pace. A study published in the late 20<sup>th</sup> century highlighted the dramatic reduction in the time necessary to develop new products (Griffin, 1997). In a cross industry comparison Griffin reported that Honda reduced its new product development cycle for cars from 60 months to 36. General Electric cut the new product development period for jet engines nearly in half, moving from 84 to 48 months. While both Mattel and Hewlett-Packard were successful in reducing new product development phases by more than half for toy cars (18 months to 5) and printers (54 months to 22), respectively. Honeywell dramatically shorted its new product cycle for thermostats moving from 48 months to just 10.

The data related to product life cycles underscores the fact that we now live in an era of innovation, which in very practical terms means that it won't be long before the latest technological gadget you bought is going to feel antiquated. According to economist Janszen (2000) we moved into the innovation age in the late 1990's. Around the same time Janszen made his claim, Kelley (2001), of the now well-known design firm IDEO, published a book called *The Art of Innovation* in which he reported:

*The biggest single trend we've observed is the growing acknowledgment of innovation as a centerpiece of corporate strategies and initiatives. What's more, we've noticed that the more senior the executives, the more likely they are to frame their companies' needs in the context of innovation. (p. 3)*

Both Janszen and Kelley's observations about the age of innovation were verified by a McKinsey (2008) study that revealed more than 70% of senior executives believed that innovation would be among the top three drivers of growth in their companies (Barsh, Capozzi, & Davidson, 2008). Similarly, Vardis and Selden (2008) found that 75% of the companies they surveyed had innovation ranked among their top three strategic directions. And the great recession did not diminish the perceived need for innovation. A global study of senior leaders in 2010 revealed that 84% of the 2,000 executives surveyed believed innovation was very important for the continued growth and survival of their organizations (McKinsey, 2010).

The changes in our world context across the 20<sup>th</sup> century and into the 21<sup>st</sup> century, from an industrial world to a knowledge world to an economy driven by innovation, impacts the types of skills necessary for success in the workplace. Both business and educational leaders have given a great deal of thought to the kinds of skills that predict success in the 21<sup>st</sup> century, and one skill set that has been consistently identified is creative thinking.

## **Thinking Skills Required for Success in the 21<sup>st</sup> Century**

In the early 1990's expenditures related to the knowledge age surpassed the industrial age (Trilling & Fadel, 2009). Not surprisingly, this was also the time when reports and studies on the skills necessary for success in the modern workplace began to highlight the importance of creative thinking. It is to be

expected that as the work context evolves, so must the skills necessary for success in that context. In an industrial world the focus was on efficiency, repeatability, predictability, and carrying out tasks exactly as prescribed. While still valuable, in an economy steeped in innovation and change, these same skills began to be overshadowed by a new set of skills. Workplace skills must reflect the spirit of the times, and indeed the trends clearly show how creativity and creativity-related skills have come to the fore in the age of innovation. Table 1 provides a summary of various reports that feature the skills most necessary for success in the workplace. Each of the nine reports featured in this table, most of which were based on surveys and interviews with employers, include skills associated with creativity (creativity-related skills are denoted in bold). Beginning with the 1990 book *Workplace Basics*, and stretching over a 25-year period, these national reports show great consistency with the inclusion of creativity or creativity-related skills in every list.

The most recent list produced by a Bloomberg/Businessweek (Otani, 2015) survey of 1,320 recruiters revealed that 42% of recruiters identified Creative Problem Solving as a highly desirable skill among job applicants. The last column on the right of Table 1 presents the Bloomberg/Businessweek survey in rank order based on the percentage of the MBA recruiters who identified that particular skill among the five skills each considered to be most important. Besides Creative Problem Solving, other skills that have been associated with creativity (see Puccio, Mance & Murdock, 2011) were perceived as being highly important by these MBA recruiters (i.e., Strategic thinking 53%, Leadership 50%, Adaptability 29%, and Risk-taking 20%). What is concerning is that these recruiters identified three creativity-related skills as being the most difficult to find among job applicants. Specifically, 47.3% said it was hard to find applicants who possessed Strategic Thinking, closely followed by Creative Problem Solving at 44.4% and Leadership skills at 42.2%. Taken together, it would seem that while creativity-related skills are in high demand in the innovation economy, educational systems have appeared not excel at developing these high-demand work skills.

The numerous reports found in Table 1 certainly highlight the fact that creativity-related skills are deemed important by prospective employers, but even a more crucial consideration may be the fact that a bulk of the jobs that will be available to humans in the future are those that require creative thinking. Frey and Osborne (2013) developed a formula that predicts the probability that a particular job will become computerized. These Oxford University researchers applied their rigorous methodology to 702 different occupations. Table 2 presents the results for 20 occupations analyzed by Frey and Osborne. The right column provides an illustration of occupations that were determined to have a greater than 95% probability of becoming automated, while the right column shows a sampling of occupations that were determined to have a 1% or less likelihood of being computerized. One of the crucial variables that determined whether a job was future proof was the degree to which that job involved creative intelligence. In fact, creativity was a stronger predictor of jobs that were at low risk of automation than manual dexterity, finger dexterity, and social intelligence. As these researchers concluded, “Generalist occupations requiring knowledge of human heuristics, and specialist occupations involving the development of novel ideas and artifacts, are the least susceptible to computerization” (p. 40).

## **INTERNATIONAL CENTER FOR STUDIES IN CREATIVITY: MISSION**

Founded in 1967 at Buffalo State (The State University of New York), the International Center for Studies in Creativity (ICSC) is an academic unit whose purpose has been to provide undergraduate and

Table 1. Review of Skills Necessary for Success in the Workplace

Workplace Basics (1990)	SCANS Report (1991)	21 <sup>st</sup> Century Skills (2006)	Seven Survival Skills (2008)	Partnership for 21 <sup>st</sup> Century Skills (2009)	Future Work Skills 2020 (2011)	Characteristics for Employee Success (2012)	Characteristics for Employee Success (2012)	Bloomberg Businessweek (2015)
<ul style="list-style-type: none"> <li>• The Foundation - Knowing how to learn</li> <li>• Competence - Listening and oral communication</li> <li>• <b>Adaptability</b></li> <li>• <b>Creative thinking and problem solving</b></li> <li>• Personal Management - Self-esteem, goal setting, etc.</li> <li>• Group Effectiveness - Interpersonal skills, negotiations, team work</li> <li>• Influence - Organizational effectiveness and leadership</li> </ul>	<p>Foundational Skills</p> <ul style="list-style-type: none"> <li>• Basic Skills - Reading, math, writing, listening, speaking</li> <li>• <b>Thinking Skills</b> - Creative thinking, decision making, problem solving, seeing things in the mind's eye, knowing how to learn, reasoning</li> <li>• Personal Qualities - Responsibility, self-esteem, sociability, self-management, integrity</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing more about the world</li> <li>• <b>Thinking outside the box</b></li> <li>• Becoming smarter about new sources of information</li> <li>• Developing good people skills</li> </ul>	<ul style="list-style-type: none"> <li>• Critical thinking &amp; <b>problem solving</b></li> <li>• Collaboration across networks &amp; leading by influence</li> <li>• Agility &amp; <b>adaptability</b></li> <li>• Initiative &amp; entrepreneurialism</li> <li>• Effective oral &amp; written communication</li> <li>• Accessing &amp; analyzing information</li> <li>• <b>Curiosity &amp; imagination</b></li> </ul>	<ul style="list-style-type: none"> <li>• Learning &amp; Innovation Skills - Critical thinking &amp; <b>problem solving</b>, communication, &amp; collaboration, <b>creativity &amp; innovation</b></li> <li>• Digital Literacy Skills - Information, media, information &amp; communication technology</li> <li>• Career &amp; Life Skills - <b>Flexibility &amp; adaptability</b>, social &amp; cross-cultural interactions, productivity &amp; accountability, leadership &amp; responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• Sense making</li> <li>• Social intelligence</li> <li>• <b>Novel &amp; adaptive thinking</b></li> <li>• Cross-cultural competency</li> <li>• Computational thinking</li> <li>• New media literacy</li> <li>• Trans-disciplinarity</li> <li>• <b>Design mindset</b></li> <li>• Cognitive load management</li> <li>• Virtual collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Student Results</li> <li>• Communicative (79%)</li> <li>• Collaborative (68%)</li> <li>• <b>Flexible</b> (67%)</li> <li>• <b>Creative</b> (66%)</li> <li>• Analytical/quantitative (49%)</li> <li>• <b>Opportunity seeking</b> (45%)</li> <li>• Globally oriented (45%)</li> <li>• Technology Savvy (41%)</li> <li>• Assertive (28%)</li> <li>• Disruptive (11%)</li> </ul>	<ul style="list-style-type: none"> <li>• CEO Results</li> <li>• Communicative (67%)</li> <li>• Collaborative (75%)</li> <li>• <b>Flexible</b> (61%)</li> <li>• <b>Creative</b> (61%)</li> <li>• Analytical/quantitative (50%)</li> <li>• <b>Opportunity seeking</b> (54%)</li> <li>• Globally oriented (41%)</li> <li>• Technology Savvy (41%)</li> <li>• Assertive (25%)</li> <li>• Disruptive (16%)</li> </ul>	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Analytical thinking</li> <li>• Collaboration</li> <li>• Strategic thinking</li> <li>• Leadership</li> <li>• <b>Creative Problem Solving</b></li> <li>• Motivation/Drive</li> <li>• <b>Adaptability</b></li> <li>• Quantitative</li> <li>• Initiative/risk-taking</li> <li>• Decision Making</li> <li>• Industry-related work experience</li> <li>• Global mindset</li> <li>• Entrepreneurship</li> </ul>

Note: Citations for sources were presented at the references section with an asterisk (\*).

*Table 2. Future proof occupations*

<b>95% Probability of Computerization</b>	<b>1% Probability of Computerization</b>
Telemarketers	Recreational/Occupational Therapists
Tax Preparers	Dietitians & Nutritionists
Insurance Underwriters	Psychologists
Umpires, Referees, Sports Officials	Choreographers & Music Composers
Tellers	Elementary School Teachers
Restaurant Hosts/Hostesses	Human Resources Managers
Cooks	Anthropologists & Archeologists
Drivers	Coaches
Locomotive Engineers	Interior Designers
Nuclear Power Reactor Operators	Industrial & Mechanical Engineers

graduate students with the creativity skills in such demand in the 21<sup>st</sup> century. Our mission statement is as follows (ICSC, 2015):

*The International Center for Studies in Creativity credentials creativity through diverse programs that cultivate skills in creative thinking, innovative leadership practices and problem solving techniques. ICSC provides tools that enable individuals, worldwide, to develop their own and others' creativity to foster positive change.*

The diverse programs referred to in this mission statement include both credit-bearing educational programs and non-credit professional experiences. With respect to formal educational programs, the ICSC offers undergraduate and graduate curricula that are discussed more in detail in the section that follows.

ICSC, to our knowledge, was the first educational institution to offer a graduate program specifically focused on creativity. Today, ICSC has over 600 alumni from the Master of Science in Creative Studies and the Graduate Certificate in Creativity and Change Leadership programs. As an international center these former students can be found around the globe. In fact, given its international appeal the ICSC has led the way in leveraging distance-learning technology to make its graduate programs available to anyone in the world. To better understand the structure and content of the ICSC graduate programs, as well as how these courses address and promote the 21<sup>st</sup> century creativity skills referred to previously, the following section closely examines our graduate curriculum.

### **A Graduate Program in Creativity: Seminal Roots of an Academic Program in Creativity**

The seeds for a university-level academic program in creativity can be traced back to Alex Osborn's (1953) seminal work in advertising in the early to mid 20<sup>th</sup> century. The developer of brainstorming and a deliberate creative-process model, called Creative Problem Solving (CPS for short), he successfully integrated his creative methods into the business world and expressed the need for more creativity in education. He articulated his desire to bring a more creative trend to education in his book *The Creative*

*Education Movement (as of 1964)* (Osborn, 1964) where he described the need to incorporate creativity into existing courses, as well as offer separate courses on CPS.

Osborn teamed up with Sidney Parnes to further develop the CPS process through the Creative Education Foundation’s Annual Creative Problem Solving Institute and through the development of university-level courses. Parnes, along with Ruth Noller, further developed these courses by creating a sequence of undergraduate academic courses in creativity in 1967 at Buffalo State. Later they developed graduate-level creativity courses and launched the Master’s Degree in Creativity Studies in the mid-1970s. In 1969, their collaboration led to a comprehensive experimental study on the impact of a sequence of four undergraduate creativity courses (Parnes & Noller, 1972; Reese, Parnes, Treffinger, & Kaltsounis, 1976). Perhaps one of the most comprehensive and rigorous investigations of creativity training, the Creative Studies Project provided some of the earliest evidence that university creativity courses significantly improved cognitive abilities deemed important to creative performance.

### Diverse Offerings in Creativity

Today, the International Center for Studies in Creativity offers four distinct academic programs in creativity. Our academic programs include an undergraduate *Minor in Creativity Studies*, an undergraduate *Minor in Leadership*, a *State University of New York (SUNY) Certificate in Creativity and Change Leadership* and a *Master of Science in Creative Studies*. Table 3 provides a summary of the number of courses and credit hours associated with each program.

The undergraduate minor programs are available for students enrolled in all majors (i.e., degree programs). At the undergraduate level, students seeking degrees from the four schools (School of Arts and Humanities, School of the Professions, School of Education and the School of Natural and Social Sciences) can choose to minor in either creativity or leadership (or both). It should be noted, that students do not need to minor in these programs to take advantage of these courses. The introductory level courses are made available to all Buffalo State students.

The *Creative Studies Minor* provides students with deliberate creativity tools, techniques, and strategies that are equally applicable to their professional and personal lives. They gain expertise in facilitating creative problem-solving teams, managing diverse groups, and creating an environment that nurtures creative thinking. The *Leadership Minor* program serves as a nexus for connecting and integrating the insights of a variety of disciplines in understanding the complex phenomenon of leadership. Students are introduced to a range of leadership theories and models, and course assignments and activities focus on fostering practical skills associated with leadership competence. Additionally, given the ICSC’s thought leadership in connecting creativity to leader effectiveness (Puccio, Mance & Murdock, 2011), special emphasis is given to the various ways in which creativity practices help to inform leadership.

Table 3. Four academic programs at ICSC

Undergraduate Minors		Graduate Programs	
Creative Studies	Leadership	SUNY Certificate: Creativity & Change Leadership	Master of Science in Creative Studies
18 Credit Hours (6 courses)	18 Credit Hours (6 courses)	18 Credit Hours (6 courses)	33 Credit Hours (11 courses)

## **International Center for Studies in Creativity**

These undergraduate minor programs are designed to provide students in any Bachelor's degree program with the creativity and leadership skills that will make them more marketable and effective in today's workforce. While a great complement to any degree program, as creative-thinking and leadership are valued in all professional arenas, students studying Business, Communications, Technology, Psychology, and Criminal Justice are among those most likely to pursue the minor programs offered by the ICSC.

ICSC's graduate programs, the *SUNY Certificate in Creativity and Change Leadership* and the *Master of Science in Creative Studies*, attract students from a diverse range of academic and career backgrounds. The program has alumni who are practicing educators and educational administrators, military personnel, entrepreneurs, consultants and trainers, social workers, full-time parents, artists, psychologists, professors, nurses, lawyers, priests, engineers, managers, and not-for-profit administrators. Some of the unique occupations held by our alumni include humorist, professional clown, outdoor education leader, toy designer, inventor, improvisation trainer, artistic director of a theatre company, and philanthropist. At present, of the more than 80 students enrolled in ICSC's graduate program 26% are internationals. With the exception of Antarctica, students have come from all continents. Many are professionals with decades of experience and in some cases they have already earned advanced degrees, such as Master's of Business Administration and various doctoral degrees.

All applicants to ICSC's graduate programs, in addition to other admission criteria, are required to write a letter of intent in which they explain why they wish to earn a Master's degree in creativity. Unlike more traditional graduate programs, where the reasons for applying might be more apparent, a certificate or Master's of Science degree in creativity requires an initial understanding of the nature of creativity and how creativity might enhance students' professional and personal goals. This part of the review process for acceptance into the program provides important information as to the degree of fit between the student and the curriculum.

To provide some insight into the diverse backgrounds, expectations and future aspirations of our graduate students, we share a few quotes extracted from letters of intent submitted by four graduate program applicants. An international student who was an aerospace engineer, for example, expressed his future goals in the following way:

*I want to integrate and use as much tools and concepts as possible. I will use it in my daily reality at work, specifically in project management... and help organizations and higher management of Fortune 500 companies to become more effective and innovative by using tools and techniques learned during my Master's degree. I'm also aiming to develop partnerships with a network of consultants across North America and Europe, that will give me the opportunity to work with different cultures and contexts.*

A former business owner and school board member who decided to become a high school educator eight years before applying to the Master's degree program described how the education system should "teach students to think creatively, solve real problems and challenge their perceptions." A university faculty member, who in a former career managed multi-million dollar advertising budgets, shared a similar passion for creativity in education:

*As individuals, thinking is our core competency. Nothing defines us more than our ability to consider, evaluate and resolve issues. The way we think, how we view and solve problems, becomes our competitive advantage. As Advertising Professors, teaching students to understand the way they think, and how it has been developed through their learning years, is paramount to encourage change in their thought process.*

*Providing them with the cognitive tools they need to succeed, change their creative flow process from linear, logical thinking to a more open, creative arena. Success in advertising is dependent on imaginative thinking, inspired through brainstorming activities, in order to develop original campaign concepts.*

As a final example, an organizational development practitioner described how the inclusion of creativity practices might expand opportunities both inside and outside of her organizational development practice. As an aside, the sense of wonder and openness to ambiguity expressed in the following passage is a core characteristic of highly creative individuals.

*It is one thing to facilitate change and it is another to provide individuals with the insight, tools and techniques so they can identify and initiate growth within themselves or their organization. I do not know yet what this shift from facilitating to empowering looks like. Perhaps it will lead me on a path as an organizational coach, therapist, career advisor/coach or a role my mind has not yet imagined. But I am excited to see how it unfolds and realize in order to reach this goal I need to continue my own learning in the fields of change and development.*

### Graduate Level Study in Creativity: Overview of the Certificate Program

The State University of New York sanctioned certificate in *Creativity and Change Leadership* is an 18 credit-hour graduate-level certificate. Approved in 2001, this six-course graduate program is made available to both those who wish to study on campus and those who prefer to complete the certificate as a distance student. Distance students take two residential courses in an intensive summer institute in Buffalo (i.e., two weeks), followed by online courses during the fall and spring semesters, and conclude the certificate program with another summer institute. Campus-based students take most, if not all of their required courses in a seated or hybrid format. As all of the certificate courses can be applied towards the Master of Science Degree, most certificate students go onto complete the full degree. The course structure of the SUNY Certificate is provided in Table 4.

### Master of Science in Creative Studies

The *Master of Science in Creative Studies*, approved in 1975, requires a total of 33 credit hours (i.e., 11 courses) and is broken into three blocks of courses: required, culminating experiences, and electives. The degree contains seven required courses (each course is three credits). Students must select one culminating experience that ranges from zero to six credit hours: a comprehensive examination and portfolio review

Table 4. SUNY certificate in creativity and change leadership: course overview

Required Courses (15 credits)				
CRS 559 Principles in Creative Problem Solving	CRS 560 Foundations of Creative Learning	CRS 580 Creativity Assessment: Methods and Resources	CRS 610 Facilitation of Group Problem Solving	CRS 635 Creativity and Change Leadership
Elective Course (3 credits)				
CRS 625 Current Issues in Creative Studies	OR	CRS 670 Foundations in Teaching and Training Creativity		

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(0 credits); a master’s project (3 credits); or a master’s thesis (6 credits). Depending on the culminating experience selected, this will leave the student with a range of 6-12 credits for the elective courses. The Master of Science Degree is offered both to local students as well as distance students. Additionally, in collaboration with the Center for the Development of Creative Thinking (COCD, Belgium) and King Willem I College (The Netherlands), both the Graduate Certificate and Master’s degree programs are available to a European-based cohort of students. Required courses are as follows:

- CRS 559 Principles in Creative Problem Solving
- CRS 560 Foundations of Creative Learning
- CRS 580 Creativity Assessment: Methods and Resources
- CRS 610 Facilitation of Group Problem Solving
- CRS 625 Current Issues in Creativity Studies
- CRS 635 Creativity and Change Leadership
- CRS 670 Foundations in Teaching and Training Creativity

Within the Master’s Degree curriculum, the required courses in addition to the culminating course, are organized into three strands. Each strand represents a distinct approach to the field of creativity studies, and reflects an integration of theory, application, and research. These strands, and their related courses, are outlined in Table 5.

**Overview of the Foundations of Creativity Strand**

The *Foundations of Creativity Strand* surveys various approaches, models and theories useful in understanding the nature of creativity and creative behavior. Although understanding scholarly creativity literature and knowledge, both historically and current, is a focus of this strand, this intellectual pursuit is underscored and reinforced through applied-learning experiences that also serve to build leadership capacity. Students grow in their ability to articulate their original views of creativity, their philosophy

*Table 5. Required courses in the M.S. in creative studies by strands*

<b>Foundations of Creativity Strand (9 credits)</b>		
<b>CRS 560</b> Foundations of Creative Learning	<b>CRS 625</b> Current Issues in Creative Studies	<b>CRS 635</b> Creativity and Change Leadership
<b>Creative Problem Solving &amp; Facilitation Strand (9 credits)</b>		
<b>CRS 559</b> Principles in Creative Problem Solving	<b>CRS 610</b> Facilitation of Group Problem Solving	<b>CRS 670</b> Foundations of Teaching and Training
<b>Research, Development &amp; Dissemination Strand (Varies from 3 to 9 credits)</b>		
<b>CRS 580</b> Creativity Assessment: Methods & Resources	<u>Culminating Experience Choices (student selects one):</u> <ul style="list-style-type: none"> <li>● <b>CRS 795</b> Master’s Thesis (6 cr.)</li> <li>● <b>CRS 690</b> Master’s Project (3 cr.)</li> <li>● Comprehensive Exam &amp; Portfolio Review (0 credits)</li> </ul>	
<b>Elective Courses (Varies from 6 to 12 credits)</b>		
Student select from courses department, other courses at Buffalo State and/or other accredited higher education institutions in consultation with academic advisor.		

and vision for themselves as creativity professionals through an informed understanding of the historical foundations of creativity studies. Students are poised to contribute to the creativity field's scholarly conversation through the foundation strand. The required courses in the strand are identified in Table 5.

The first two courses, CRS 560 and CRS 625 can be taken in sequence or simultaneously. The third course, CRS 635 is the capstone course and is taken at the end of the Master's program. A few of the key workforce skills focused on in this strand include building curiosity and imagination, as well as flexible thinking and creative-leadership skills.

The first core course in this strand, *CRS 560 Foundations of Creative Learning*, focuses on theories and research that serve as a conceptual foundation to the discipline of creativity studies. Students develop an overall understanding of basic principles, as well as historical definitions, models and theories that laid the groundwork for the current field of creativity. One goal of the course is for students to understand the integrated function among key historical definitions, principles and constructs in the discipline of creativity.

The second core course in this strand, *CRS 625 Current Issues in Creativity*, is an in-depth analysis of current research and theoretical perspectives related to the nature and nurture of creativity. Students engage in skill development in research and scholarship to increase critical-thinking skills and general content literacy relative to creativity scholars in various disciplines, interpret findings from empirical and non-empirical sources, and articulate their analysis of a big question in the field of creativity. In fact, the department selects annually the best student papers that are then published in a volume of first works called *Big Questions in Creativity* (see, for example, Culpepper & Burnett, 2015). Some of the course goals include: identify major contemporary scholars in the field of creativity studies; and articulate current trends, gaps and issues in the field.

The third core course in this strand, *CRS 635 Creativity and Change Leadership* is not only the last course in this strand, it is also the capstone course for the Master's program. The course focuses on understanding and applying the characteristics of change leadership in the context of creativity and Creative Problem-Solving. Students focus on the dynamics of leading change, as well as an examination of key creativity scholars and their areas of interest and philosophical perspective on creativity. The course provides a theoretical and practical launching point for students to examine their future contributions to the field, domain, and discipline. One of the main learning objectives of the course is for students to develop their own unique personal philosophy, values, theoretical foundations and definition of creativity and to develop a future image of themselves as creative leaders in their professional arena, community and in their personal lives. Towards that end, all students are required to submit a paper that captures their philosophy of the nature and nurture of creativity, their personal vision for how they will manifest this vision, and a strategic plan for achieving the vision.

## **Overview of CPS Process Strand and Brief Examination of CPS**

The *Creative Problem-Solving and Facilitation Strand* emphasizes ways to deliberately foster creative potential by helping the student to learn, apply, and teach specific CPS tools, process frameworks and small-group facilitation techniques. The courses are sequential as the skills in lower level courses serve as a foundation to subsequent courses (see Table 5).

Courses in this strand are based on the more than 60 years of development that ensued Osborn's introduction of CPS in 1953. Since that time CPS has been one of the most widely researched deliberate creative-process methods and, as such, has undergone a natural evolution into the current version taught

in this strand (see Puccio, Murdock & Mance, 2005 for a review of various CPS models and Puccio, Firestien, Coyle & Masucci, 2008 for a review of the impact of CPS in organizational settings). In this strand students develop mastery of the current version of CPS, referred to as the Thinking Skills Model (see Puccio et al., 2011). By mastery we mean the successful application of CPS at individual, team and organizational levels.

The purpose of this paper is not to provide an in-depth review of CPS, see Puccio et al. (2011) for that; rather, our goal is to offer a sufficient overview to allow readers a basic understanding of the applied-creativity skills our students develop as a result of the courses in this strand. To that end, Figure 1 provides a graphic image of the Thinking Skills Model. Students learn to apply this deliberate creative process, and associated cognitive tools, to their own challenges, as well as how to lead others to breakthrough solutions through the application of this methodology. The hallmark of CPS is the balance between divergent and convergent thinking. Figure 2 shows the balance between the purposeful generation of multiple original alternatives (divergent thinking), learning to go beyond what is already known or familiar, and the selection and development of those novel options that are seen as most promising (convergent thinking). Here students learn the cognitive skills associated with divergent thinking, namely fluency, flexibility and originality, as well as the affective attitudes that promote effective divergent thinking, most notably how to suspend judgment. The productive balance between divergent and convergent thinking, which has been cited as a crucial development in human evolution (Gabora & Kaufman, 2010), is featured in each step of the process and serves as a foundational skill as a creative person and creative leader.

The first course in the sequence *CRS 559 Principles in Creative Problem Solving* focuses on introducing students to principles and tools associated with CPS, with an aim at developing mastery at an individual

*Figure 1.*

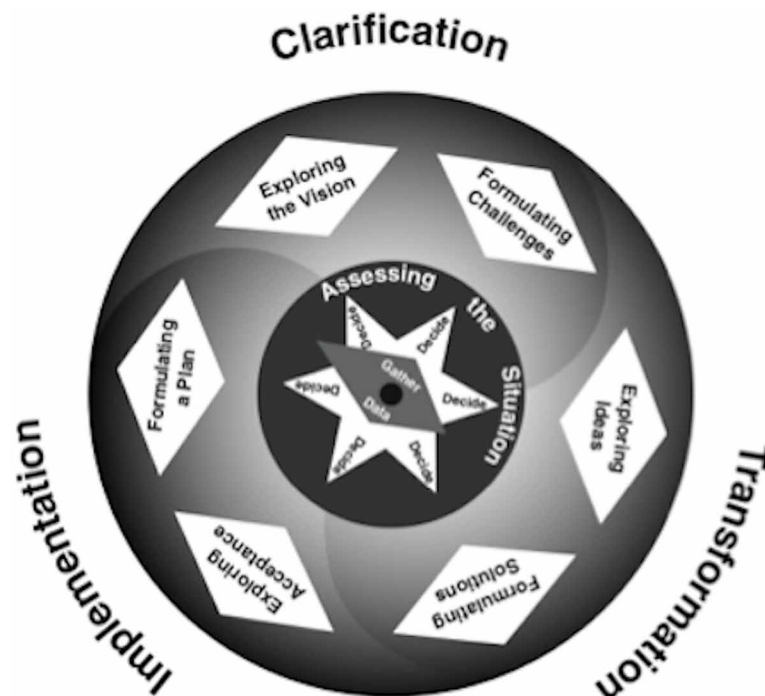
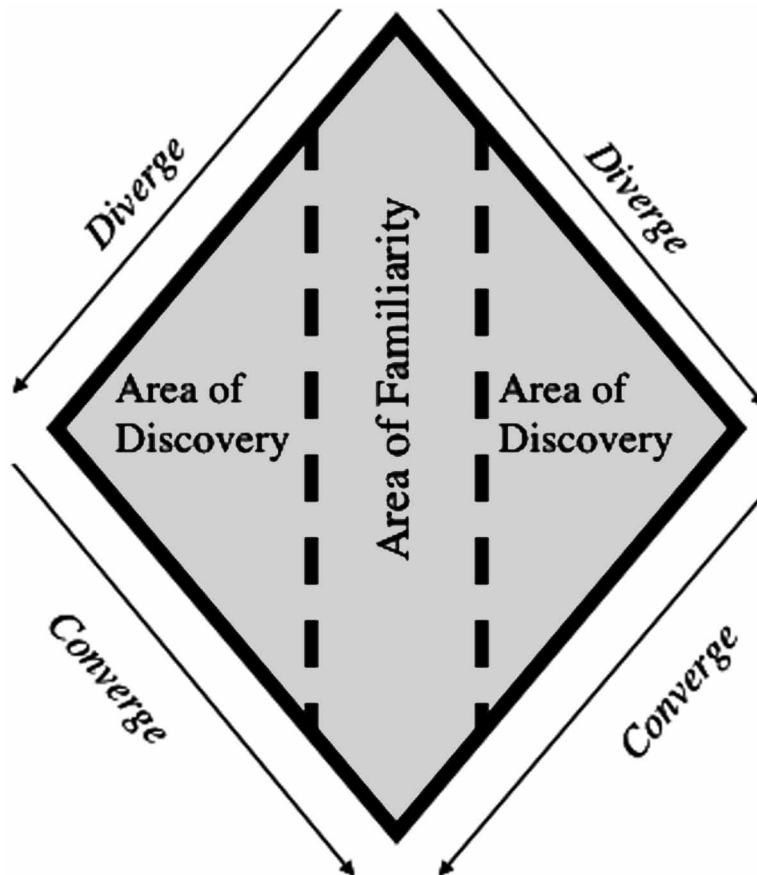


Figure 2.



level. The focus is on learning how to balance and enhance the capacity to engage in both divergent and convergent thinking. To that end, students learn to apply the key creative principles suspending judgment and affirmative evaluation. Goals for the course include: articulating the basic function of process in creative thinking and problem solving, accurately applying divergent and convergent thinking principles, and successfully utilizing CPS on a personal challenge.

The second course in this strand, *CRS 610 Facilitation of Group Problem Solving*, focuses on advanced strategies for leading small groups through the CPS process; mastery of facilitation techniques and general CPS skill building. Students gain experience as a CPS facilitator, working with clients and resource group members. Some of the goals for this course include: describing a skill set for effective facilitation of small groups, demonstrating facilitative skills in small groups, and the application of specific divergent and convergent tools in group settings.

The third required course in this strand provides practical experience in using principles of creative learning, as well as advanced CPS and leadership strategies designed to facilitate change initiatives. Students engage in both guided practice and independent work in realistic teaching/training situations both within the university setting and outside in educational, business, not-for-profit and organizational settings. Students develop instructional designs and examine ways to modify teaching, training and leading with CPS and creative learning methods in various groups and situations. Some of the goals of the

course include: applying skills needed to facilitate or lead CPS process in real-world settings (both tools and principles); effectively delivering short learning experiences in creativity, leadership and CPS; and using creative climate dimensions to promote cooperative work in a variety of settings.

The applied nature of this strand promotes many, if not all, of the creativity-related skills deemed necessary for professional success in the 21<sup>st</sup> century (see Table 1). Beyond professional competencies, most students report that experiences in this strand prepare them to more skillfully respond to life's challenges and to become more resilient when impacted by change.

## **Overview of Research, Development, and Dissemination Strand**

In the third strand, *Research, Development, and Dissemination*, students focus their efforts on demonstrating competence in understanding the science of creativity studies. Analysis of the current scholarly literature serves as a foundation from which students move towards their own original contribution to the field. This is accomplished through the successful completion of one of three culminating experiences (i.e., Comprehensive Examination, Master's Project or Master's Thesis). Several specific workforce skills that are developed in this strand include the innovation skills of critical thinking and problem solving, creative thinking as well as opportunity seeking and seeing things in the mind's eye.

The first course in this strand, *CRS 580 Creativity Assessment: Methods and Resources*, is the only course that all students are required to take within this strand (see Table 5). CRS 580 provides practical information on creativity assessment tools and methods. This course includes a basic understanding of quantitative and qualitative research principles and a critique of specific measures and methods used to assess creativity in both education and business. Students receive personal feedback on a number of measures and develop a profile of their own creative strengths. Several goals of the course include describing the fundamental issues associated with assessment such as reliability, validity and usability; applying various measurement considerations to a review and critique of methods and inventories used to assess creativity; and interpreting personal strengths through feedback received on creativity-related measures.

The three options for completing this strand include *Comprehensive Exam, Master's Project (CRS 690)* or *Master's Thesis (CRS 795)*. All three are influenced by the scientific method and include elements of inquiry, synthesis and presentation of findings. The culminating options are designed to provide students with a range of distinct learning objectives, skill development options, and final products. Based on their own interests and goals, students select from one of the three culminating experiences.

The *Comprehensive Exam* consists of a written review of the literature related to a creativity topic selected by the student, a portfolio review of the products and outcomes generated by the student throughout his or her graduate work, and an oral presentation of the key insights the student gained as a result of his or her Master's degree work. The comprehensive exam provides students with an opportunity to demonstrate the depth and breadth of their knowledge of the field of creativity studies. Furthermore, the oral presentation provides students with a chance to further refine and explore their vision as creativity professionals.

The *CRS 690 Master's Project* requires students to develop and implement an applied project focused on some aspect of their creativity studies related to their areas of expertise and interest. Students can focus in diverse areas of inquiry for their project while they continue to develop their original thinking and analytical skills in the formation and evaluation of the success of the project. Some students use their creative problem solving, change leadership and facilitation skills to implement a change initiative that has a direct impact either on the community or for the field of creativity in general, develop some

aspect of their own specific creative learning and/or formulate products and outcomes that support their own and/or others' creativity.

The *CRS 795 Master's Thesis* focuses on the design and implementation of an empirical study aimed at making an original and valuable contribution to the field of creativity. Students focus in diverse areas of inquiry while they engage in formulating, implementing, evaluating and disseminating an original study. They gain expertise in utilizing qualitative and/or quantitative research methods as well as analyzing results and formulating conclusions within the context of their study.

## **Issues, Controversies, Problems**

As cited earlier, while numerous business and educational leaders tout the importance of creative thinking and problem solving, few educational programs dedicate themselves to these important 21<sup>st</sup> century learning outcomes. The ICSC at Buffalo State serves as an example of academic department whose curricula, both undergraduate and graduate, promote the creativity skills in demand in today's workplace. Moreover, we would contend creativity and problem solving are essential life skills. The next section of this paper examines the impact of the graduate courses, and their content, on our students. As part of the ongoing assessment work at Buffalo State the ICSC conducted an examination of the degree to which its graduate courses changed students' creative attitudes. Puccio et al. (2011) contend that creative problem solving and creative leadership necessitate mastery of both cognitive and affective skills. To that end, the purpose of this exploratory study was to determine whether the graduate program contributed to enhancing attitudes that serve as crucial foundation to effective creative problem solving.

## **Impact of Graduate Courses in Creativity on the Creative Problem-Solving Attitudes of Students**

The impact of the graduate curriculum that focuses on creativity and creative problem solving was examined with 60 (Male = 22; Female = 38) students enrolled in either the graduate certificate or Master's degree program. The participants represent a broad range of educational backgrounds and work experiences from education to business.

Both qualitative and quantitative data were collected from the participants. Quantitative analyses focused on attitudes toward ideas. As described earlier, the steps in CPS process are separated into two major phases of thought: divergent and convergent thinking. In this model (see Figure 2), divergent thinking precedes convergent thinking in order to ensure that a wide range of alternatives are available during the selection and development phases of the process. While divergent thinking is generally considered a cognitive ability, individuals' *attitudes* toward ideas can serve to either promote or undermine this cognitive function. Positive attitudes toward ideas are likely to lead to superior divergent thinking and ideational productivity (Basadur, Graen, & Green, 1982; Kraut, 1976). Indeed, Dr. Ruth Noller, a founding faculty member of the ICSC, included attitude as a major driver in her mathematical formula of creative behavior (cited in Puccio, Mance, Barbero Switalski & Reali, 2012). According to this definition, creativity is the function of attitudes multiplied by knowledge, imagination, and evaluation. Noller maintained that the basic factors of creative behavior, that is the interaction of knowledge, imagination and evaluation, do not reach their full potential without the proper attitudes.

To measure creative attitudes, students completed the *Basadur 14 Item Ideation-Evaluation Preference Scale* at the beginning and end of their respective program of study (i.e., either SUNY certificate

or Master's degree program). The reliability and validity evidence for this scale was reported by Basadur and his colleagues, see Basadur and Finkbeiner, (1985); and Basadur and Hausdorf, (1996). Basadur's scale consists of two sub-scales: a six-item *preference for ideation* and eight-item *premature critical evaluation*. Both attitudes relate to the key divergent thinking principle referred to as Defer Judgment or Suspend Evaluation. Preference for ideation, specifically, examines the degree to which the respondent is open to novel and diverse ideas. While premature critical evaluation assesses the extent to which respondents report a tendency to quickly criticize original ideas. Basadur 14 Item Ideation-Evaluation Preference Scale was first administered at the beginning of Principles of Creative Problem Solving course (CRS 559), which is the first course the graduate program. The same measure was administered again at the end of the Creativity and Change Leadership course (CRS 635), which serves as the capstone course for both the SUNY certificate and Master's degree program. To obtain a more detailed perspective on students' evaluation of the graduate program, they were also asked to reflect on their educational experiences and answer the following questions: "In what ways did your attitudes about creativity change?" and "In what ways did this program impact your growth as a creative person?" Generally there is a full calendar year between the CRS 559 and CRS 635 courses.

The following research questions were explored in this assessment study:

1. Does the academic study of creativity significantly increase preference for ideation?
2. Does the academic study of creativity significantly decrease premature critical evaluation?
3. How does the graduate program impact students' lives and perspectives in general?

Average scores were calculated for each scale separately and then were compared them before and after the training. Paired-samples *t*-test was conducted for each scale separately. Qualitative data were transcribed and grouped together based on their thematic similarity.

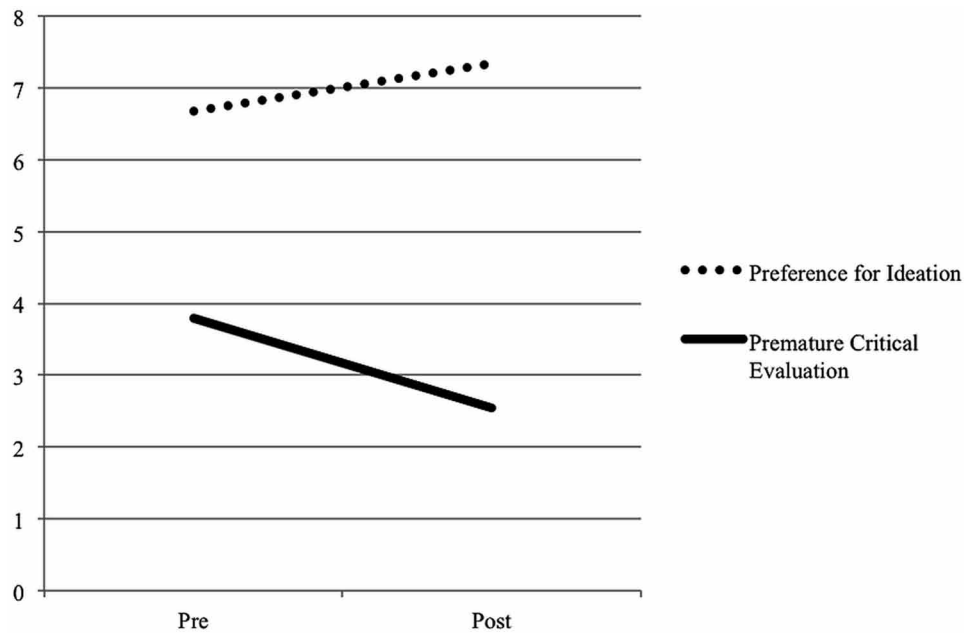
## **Quantitative and Qualitative Results**

Paired-samples *t*-test analyses indicated students' preference for ideation increased significantly, ( $t(59) = 4.50, p = .001, \eta^2 = .26; M_{pre} = 6.67, SD_{pre} = 1.09; M_{post} = 7.34, SD_{pre} = 1.08$ ) while premature critical evaluation decreased significantly ( $t(59) = 8.06, p < .001, \eta^2 = .52; M_{post} = 3.80, SD_{pre} = 1.26; M_{post} = 2.54, SD_{post} = 1.11$ ). Effect size ( $\eta^2$ ) values, which are considered "large" according to Cohen (1988), underline the fact that participating in a creativity graduate program enhanced positive attitudes toward creativity (i.e., preference for ideation) and decreased negative attitudes (i.e., premature critical evaluation). The change in these two major attitudes after the program are illustrated in Figure 3.

When change in these two attitudes is compared for two scales, a significant change was observed for both in the expected direction but the impact of the program was stronger in decreasing premature evaluation of ideas. This finding indicated that the graduate creativity program seems to be effective in teaching students both what to do, as well as what not to do to be more creative. Ackoff and Vergara (1981) defined creativity as overcoming the self-imposed constraints. The latter could be even more important than the former because creativity is stifled when factors such as cognitive fixation, habits, and blocks remain unchallenged.

Change after training was more closely examined by comparing individual items on the attitude measure, pre and post students' graduate program. As seen in Figures 4 and 5 as well as Table 6, the largest differences were found in Items 1, 2, 5, 8, 10, and 11. All of these items except item 8 belong to

Figure 3.



the subscale associated with premature critical evaluation of ideas. These items state the need for pre-judgment of ideas, intolerance toward unacceptable ideas, uselessness of wild ideas, and the importance of quality over quantity whereas item 8 is about embracing others' wild ideas.

Participants' answers to the two questions about their own personal transformation with respect to their attitudes toward creativity and their development as a creative person supported these findings.

Figure 4.

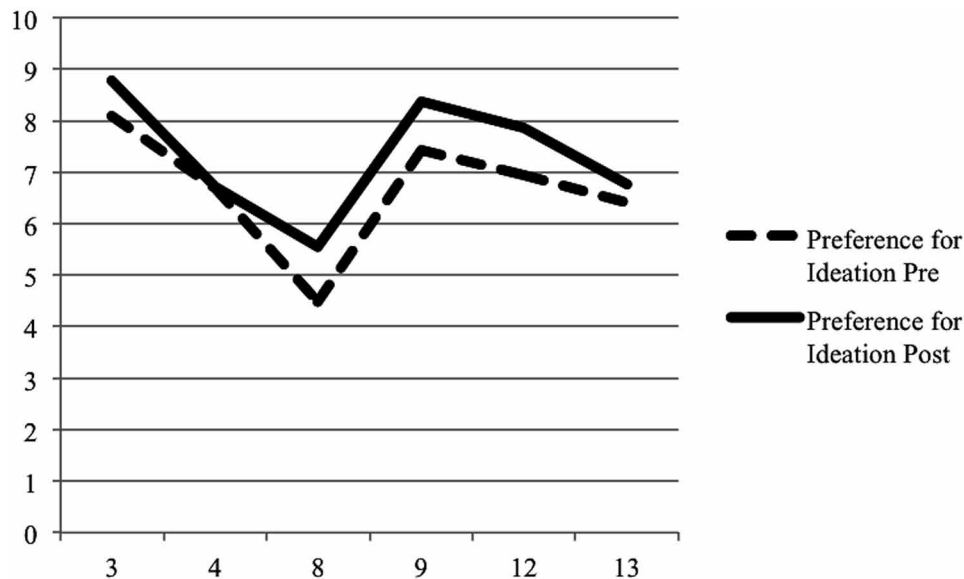


Figure 5.

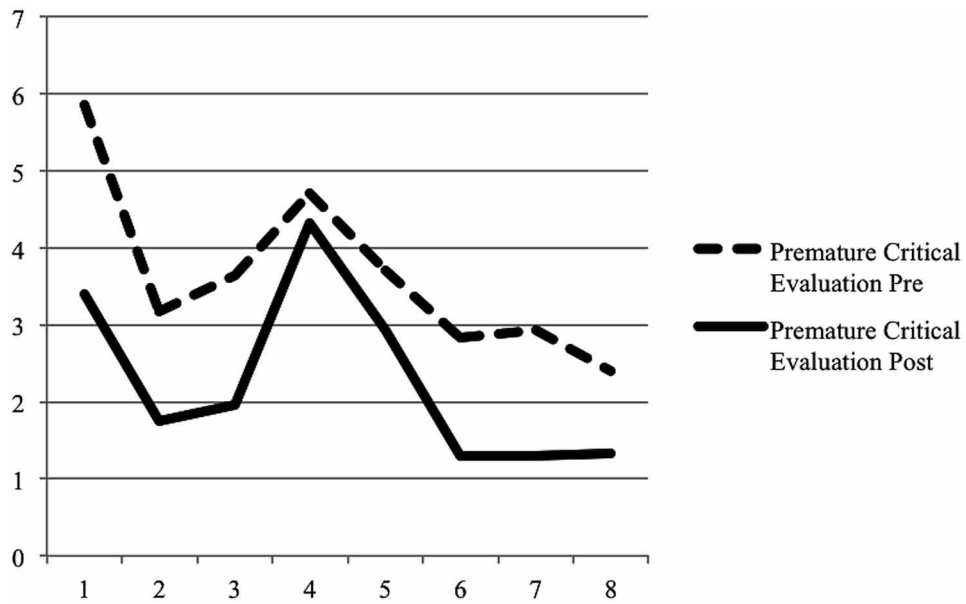


Table 6. Mean and standard deviation of individual items

	Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1**	5.85	2.07	3.40	2.35
2**	3.17	2.16	1.75	1.49
3*	8.10	1.33	8.78	.42
4*	6.68	2.24	6.72	2.28
5**	3.63	2.39	1.97	1.84
6**	4.70	2.23	4.32	2.42
7**	3.70	1.94	2.93	2.24
8*	4.48	2.17	5.55	2.30
9*	7.43	1.48	8.37	1.01
10**	2.83	2.08	1.30	.89
11**	2.93	2.21	1.30	.98
12*	6.93	2.12	7.87	1.91
13*	6.40	1.82	6.77	2.05
14**	2.40	1.48	1.33	.71
ID	6.67	1.09	7.34	1.08
PE	3.80	1.26	2.54	1.11

\*ID: Preference for ideation; \*\*PE: Premature critical evaluation

Again, the first question asked “*In what ways did your attitudes about creativity change?*” Naturally this open-ended question revealed a set of attitudes that are more extensive than those examined by Basadur’s measure.

Analysis of the responses revealed several themes. The first theme is *application of creativity*. ICSC graduate curriculum, by design, is trans-disciplinary in nature. By trans-disciplinary we mean that the content of the curriculum treats creativity as its own domain of study and therefore can be applied to all domains, disciplines, and vocational pursuits. Philosophically this reflects the beliefs held by the founding faculty of the department, as well as the current faculty, that creativity, creative thinking, and creative problem solving are necessary and applicable to all areas of human endeavor. Thus, ICSC’s graduate curriculum emphasizes applied creativity without specifying any field in particular. Commensurate with this philosophical view, students noted that they can apply creativity in both their profession and daily lives. The following sample comments reflect this attitude (initials are used rather than names of the students):

- LP:** *The biggest shift in my attitudes towards creativity is in its application. My scope about creativity has expanded from creative or critical thinking to creative being. I have always known I had a passion for creativity but I did not know how deeply powerful this learning and experience would be.*
- ND:** *I have a deeper appreciation for the historical roots of creativity, its diverse background and deeper appreciation for the power of creativity applied in the real world.*

Second, students became experts in the field of creative studies and overcame some of the common myths such as art bias (Runco, 2008), which equates and limits creativity to arts.

- PP:** *Creativity does not just belong in the realm of the arts. Creativity involves an expanded understanding of thinking and feeling. Training is invaluable. We are all given the capacity to be creative. Some people need permission, some are told they are not creative, some are fostered to live a creative life with a positive internal or external view of their creativity. It calls for a life. Creativity is a necessity for problem solving. I wish I had it as a kid.*
- MZ:** *The answer could go in so many different ways as my attitude has completely evolved. I think my philosophy, newly formed philosophy, sums it up:*
- *Before program, I believed primarily artists are creative; now I believe we are all creative and it can be fostered*
  - *Before this program, I did not understand and know there are certain skills associated with creativity; now know there are distinct affective and thinking skills for creativity.*
- AW:** *Creativity is not just “Big-C”. “Little-C” and everyday C are equally worthy.*
- JB:** *I understand it better from a research and academic point of view.*

Students also described their personal transformation as a result of their participation in the graduate program. One way to capture their experience is to describe it as a *liberating* journey.

- AW:** *I am less concerned about “rightness” and more concerned about novelty and uniqueness.*
- JB:** *I am here opened to my own creativity. We do not need PhDs to actually go out on the field and talk about it.*
- TD:** *I recognize the courage piece. I also see that I just need to use it (courage). I do not have to be right. Every act builds up your creative resilience. Do it for the doing not the getting there. We all*

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*need it. Our sadness (the world) is related to its absence. We all have a right to it. It is a choice to use it or not.*

**PB:** *Understand the importance of tolerating ambiguity, complexity in general, and silence during idea generation.*

- *That understanding of self can open you up to creative expression.*
- *Creativity can be taught and inspired.*
- *To stay open and not prejudge, allow ideas to incubate.*

Finally, we also found that their attitudes changed in regard to the *educability of creativity* and their role and function toward this goal.

**BW:** *I have always held creativity in high regard. I tell my students that it is the area of the rubric that I hold most sacred I will grade the hardest. My attitude has changed in how I can convey and teach what creativity is to my students. I was not sure, but now I feel that I have tools, language and process to pass on.*

The second question was broader and explored additional ways in which the graduate program impacted their lives. The question was “*In what ways did this program impact your growth as a creative person?*” Some emphasized that they had greater self-awareness and their belief in self was positively impacted.

**LP:** *I have learned fundamental life lessons through this program. I have realized is much about myself – what holds me back—what gets in my way and how to break through all of that. Beyond the learning I have gained so much from the experience of connecting with all the beautiful—talented creative people in my cohort and within the creativity community.*

**JB:** *It has affirmed and strengthened my places of power, uniqueness, and provided a blueprint for moving forward using them.*

**AW:** *It has truly been a way for me to identify the “gaps” I have left in my sense of fulfillment and find the right to fulfill...creativity was what I was not acknowledging, I was not brave enough, I needed the tools and now I have them.*

**TD:** *I am bare...*

*My voice matters and has value*

*Being wrong is as important as being right*

*Problems correlate to its absence.*

*We can solve anything we put our minds to*

*There are so many ways to do, be, and think.*

*Truly unbelievable journey...*

*Deep insight. Most incredible learning!*

*Most fun, most challenge, most growth EVER. Hard too, but in a meaningful way.*

They embodied some of the creative characteristics such as tolerance of ambiguity and complexity. They reported becoming more proactive about their own lives. They are more positive, constructive, and solution oriented.

**JB:** *I finally accept the fact that I do not have to fulfill only others’ creativity, but also my own.*

- *I grew up by connecting with other people.*
- *It helped me to reconnect with my heart and my gut.*

**DR:** *I am a completely different person – still me but centered and open. I embrace the differences in the world around me. I am part of something greater than myself. I want to inspire this growth in others.*

**PP:**

- *It enhances my creativity and need to spread it to others.*
- *I have clear way to spread creativity, including a “I can solve problems” attitude,” tools, and other people to consult and grow with.*
- *I am so much more articulate about how to speak about creativity and how to listen to others’ ideas.*
- *I can be deliberate and even if it is a mistake it serves decision-making and growth.*
- *Know thyself has expanded into, know thyself as a creative person.*

Some students’ experiences can be described as transformational. They underlined their change and growth through the program in the following ways.

**MZ:** *It has changed my perspective, pushed my growth and broadened my understanding of all facets of creativity.*

**BW:** *It has helped give depth and understanding to what it means to be creative, how important it is, and what change can come from being a creative person, not only for myself, but for others that I inspire with my own creativity and the creativity I can inspire within them.*

**PB:**

- *This has been the best experience .....the most practical education directly related to what to do.*
- *It was inspirational, life-changing, and of course educational.*

## SOLUTIONS AND RECOMMENDATIONS

Like the many thought leaders cited in Table 1, the ICSC faculty believe creativity, creative thinking, and creative problem solving are essential for professional success in the 21<sup>st</sup> century. Moreover, as life outside of the workplace provides additional challenges and opportunities, we believe that creativity is an essential life skill. With that in mind, the ICSC has set for itself the audacious vision of “Igniting creativity around the world: Facilitating the recognition that creative thinking is an essential life skill.” This vision is achieved, certainly, through engagement with the students enrolled in ICSC’s undergraduate and graduate programs. Students often become future colleagues and join the faculty in creating new programs and products aimed at fulfilling this vision. And as graduates of an educational program in creativity, former students often act as change agents in their respective fields and communities; thereby introducing countless others to the power of creative thinking and creative problem solving (see Fox, in press, for a variety of examples of how ICSC graduates have woven creativity into their professional lives).

To achieve its vision ICSC has looked beyond its own community of faculty, students and alumni. We have entered into partnerships with others to assist them as they form their own creativity programs and initiatives. Perhaps, most notable is the Memorandum of Understanding ICSC has entered into with Sheridan College, Oakville, Canada. Under its new strategic direction Sheridan set a bold objective to

become a creative campus; that is an institution within which all students would have the opportunity to develop 21<sup>st</sup> century skills. Specifically, Sheridan (2015a) defined its mission as follows: Sheridan delivers a premier, purposeful experience in an environment renowned for creativity and innovation. With creativity and innovation as a priority area within its strategic plan, Sheridan offered the following focus on these crucial skills:

Creativity and Innovation—woven into everything that we do, where teaching, learning, practice and process reflect our commitment to the advancement of creative capacity, creative engagement, collective wisdom, and people success.

Sheridan has turned this strategic aspiration into tangible results. Since 2012 nearly 1500 students have enrolled in a general elective course titled *Creative Thinking: Theory and Practice*. To both hone creativity skills among students and to provide them with a tangible credential, Sheridan created a board-approved certificate in Creativity and Creative Problem Solving (Sheridan, 2015b). This undergraduate program, which closely mirrors ICSC's undergraduate minor in Creative Studies, was launched in 2014 and has enrolled nearly 1,000 students in the courses that comprise this certificate. Among other initiatives aimed at fostering a creative culture and campus, Sheridan has trained more than 200 faculty and staff in CPS and has formed a core group of professionals who received advanced training as CPS facilitators. While it seems almost all colleges and university rightfully tout the importance of critical thinking, Sheridan serves as a shining example of an educational institution that has courageously climbed Bloom's taxonomy of thinking to actively engage its students in the highest level of human thought—*Creating*.

## **FUTURE RESEARCH DIRECTIONS**

The results of the research findings presented in this chapter focused on the changes in attitudes toward creativity. Allport (1935) defined attitudes as “a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related” (p. 810). Put simply, attitudes precede and direct behaviors. Therefore, the impact of creativity training on other aspects of creativity such as everyday creative behaviors and application of creative thinking skills in the workplace and professional environment needs to be studied. To this end, longitudinal research could be undertaken to reveal the subsequent outcomes. Also, the current study did not include a control group. Inclusion of a control group could reduce the possibility of a Type 1 error.

The programs offered by ICSC have been developed, tested, and evolved over decades. Besides studies that evaluate the programs overall, further studies could explore the usefulness of particular content and tools contained in the curriculum. Such an approach could improve the impact and quality of the courses and programs in the long term.

## **CONCLUSION**

The goal of education should be to prepare the learners for the future. Speed of change and limited predictability of the future requires educators to focus on the crucial life skills that will help learners stay up-to-date, savvy, and adaptive. As summarized in this chapter, creativity is certainly a good example of these important professional and life skills. ICSC offers programs in both graduate and undergradu-

ate levels with an emphasis on applied creativity. This emphasis stems from the premise that everybody has creative potential and creativity is a learnable and improvable skill. The chapter provided evidence from qualitative and quantitative data indicating that the graduate program at ICSC has a transformative influence on students in general and on their attitudes more specifically. What is more encouraging is the fact that other institutions of higher education are now recognizing this impact.

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## KEY TERMS AND DEFINITIONS

**21<sup>st</sup> Century Skills:** Critical skills needed to be successful in collegiate programs and contemporary careers and workplaces.

**Alex Osborn (1888-1966):** Advertising executive who is the father of brainstorming, the founder of Creative Education Foundation, and the author of *Applied Imagination: Principles and Procedures of Creative Problem Solving*.

**Certificate in Creativity and Change Leadership:** Eighteen credit-hour graduate-level certificate program sanctioned by The State University of New York (SUNY) that is available to students who wish to study on campus or as a distance student.

**Convergent Thinking:** Reasoning that brings together relevant information to arrive a valid conclusion.

**Creative Attitudes:** The way one feels and acts in relation to creativity.

**Divergent Thinking:** The ability to think in various directions and the capacity to generate many ideas, solutions, and options.

**Master of Science in Creative Studies:** Thirty-three credit-hour program with three strands namely Foundations of Creativity Strand, Creative Problem-Solving and Facilitation Strand, and Research, Development, and Dissemination Strand.

**Ruth Noller (1922-2008):** Navy veteran and professors of mathematics and creativity who developed the formulaic definition of creativity in which attitudes are defined as the crucial catalyst for creativity that emerges from the interaction of Knowledge, Imagination and Evaluation.

**Sidney Parnes (1922-2013):** Academic and former president of Creative Education foundation that developed the Creative Problem Solving and the author of *Creative Behavior Guidebook*.

**Thinking Skills Model:** Elaboration and expansion of Creative Problem Solving model with specification of required cognitive and affective skills involved.