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Enhancing Thinking and Leadership Skills through Creative Problem Solving

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Introduction: The Need for Creative Thinking

In 1953 Alex Osborn published his groundbreaking book *Applied Imagination: Principles and Procedures of Creative Problem-Solving*. In this book Osborn introduced the Creative Problem Solving (CPS) and through this creative process model he outlined a set of principles and procedures that could be used to deliberately facilitate creative thinking. Certainly the most well known procedure described in this book is the creative thinking tool Brainstorming.

Osborn's book was truly radical for its day. Its main argument departed significantly from standard views of creativity; the belief held by many that creativity could not be systematically nurtured or drawn out–rather it is a gift that emanates from an unknown source. As noted by Sternberg and Lubart (1999):

> Perhaps the earliest accounts of creativity were based on divine intervention. The creative person was seen as an empty vessel that a divine being would fill with inspiration. The individual would then pour out the inspired ideas, forming an otherworldly product. (p. 5)

The main message of Osborn's book was that creative thinking could be developed, that people, through practice, could deliberately improve their creative thinking skills. Furthermore, Osborn democratized creativity. Contrary to the popular belief that only certain people possessed the innate talent to be creative, Osborn argued that creative potential was universal. Osborn (1963) suggested:

> Scientific tests for aptitudes have revealed the relative universality of creative potential. The Human Engineering Laboratories analyzed the talents of large groups of rank-and-file *mechanics* and found that two-thirds of these rated *above* average in creative capacity. An analysis of almost all the psychological tests ever made points to the conclusion that creative talent is normally distributed–that *all* of us possess this talent to a lesser or greater degree–and that our creative efficacy varies more in ratio to our output of mental energy that in ratio to our inborn talent. (p. 15)

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What compelled this advertising man to write a book that promoted the view that creativity could be developed? As a businessman Osborn saw the critical value of creative thinking; how the application of creative thought in the workplace could result in finding ways to reduce costs, improve safety, and drive profits. On a broader scale Osborn recognized the need for creative thinking for community, domestic and international challenges. In short, Osborn wanted to uplift people's capacity to creatively respond to complex challenges. From this recognition grew a dream to have an impact on the educational system. To provide educators, at all levels, with the means to nurture the creative talents of their students so they could become contributing members of society, to be in a better position to actively bring their creative talents to bear at work, in their communities, and on national and international challenges.

The first edition of Osborn's book was published more than 50 years ago and it would seem that the same factors that necessitated the need for creative thinking then are even more present in our world today. In the face of global competition companies now pay great attention to the need for innovation. Organizations scramble to find new products and services they can get to the market place. And it is widely accepted that the wellspring for organizational innovation is the creative capacity of an organizations' employees. As Amabile, Burnside and Gryskiewicz (1999) suggested, "Creativity is the crucial 'front-end' of the innovation process; before innovation can happen, the creative ideas must be generated by individuals and teams so that they can be successfully implemented" (p. 1). And on a broader scale economist Florida (2002) argued that, "Human creativity is the ultimate economic resource. The ability to come up with new ideas and better ways of doing things is ultimately what raises productivity and thus living standards" (p. xiii). But we would argue that creativity is not just about driving the economic engine of our societies, it has great value in our daily lives. As Guilford (1968a) offered "To live is to have problems and to solve problems is to grow creatively" (p. 12). As humans we contend with an ever-increasing amount of change. Our lives are filled with more choices, more information, more novelty and greater levels of complexity. For these reasons we have argued elsewhere that creative thinking is an essential life skill (Puccio & Murdock, 2001).

If so many agree that the capacity to think creatively is critical in both our professional and personal lives, we need to then ask ourselves how well do our educational systems develop this important skill in students? Do our current educational systems and practices do a significantly better job in developing creative thinking than the systems and practices in place when Osborn wrote his book more than 50 years ago? How well do we as educators arm our students with the kinds of skills that will enable them to be successful in an increasingly complex world? Certainly one clear advancement has been the creation of processes and methodologies that can be used deliberately to nurture the creative talents of individuals. Since Osborn's introduction of CPS in *Applied Imagination* this creative process model has undergone both ongoing research and development. In regard to research, CPS has been shown to be one of the most effective methods for enhancing creativity skills (Scott, Leritz & Mumford, 2004). In terms of the model itself, insights gained through research and practice, both inside and outside the classroom, have been used to continuously refine the model. In this chapter we present the latest version of the CPS model and discuss implications for the use of CPS in schools.

Creative Problem Solving: The Thinking Skills Model

Since its introduction in 1953 the CPS model has undergone numerous changes. For a review of the various versions of CPS see Puccio, Murdock and Mance (2005), as well as Isaksen and Treffinger (2004). We refer to our present view of CPS as the Thinking Skills Model, as our goal has been to articulate what we believe are the various kinds of thinking skills that are called upon while engaged in this deliberate creative process. The current graphic model of CPS is shown in Figure 1. We will briefly describe this model and the associated skills. For a more elaborate description see Puccio, Murdock and Mance (2005, 2006).

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Insert Figure 1 about here

Figure 1: Creative Problem Solving: The Thinking Skills Model

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Before describing the specific elements with the CPS process, we will first define each word in the three-letter acronym 'CPS' (Puccio, Murdock & Mance, 2006). By *creative* we mean the production of novel ideas that serve some purpose or offer some value. By *problem* we mean the discrepancy between what you have and what you want. A problem can either be a predicament or an opportunity. In the case of a predicament a person, team or organization is reacting to a change that threatens current levels of performance, e.g., students' test scores are falling, market share is on the decline, or changing demographics are placing a burden on social services. An opportunity, by contrast, is a proactive pursuit of a promising goal that is brought about by a favorable juncture of circumstances, e.g. a new headmaster has a very open-minded leadership style and as a consequence teachers bring forward a set of progressive educational programs, as the result of a flawed experiment a scientist strikes upon a new invention, or observations of teenagers' behavior leads a company to develop a new product idea. Finally, by *solving* we mean taking action, not only actively searching for solutions but being committed to resolving the situation through the application of imaginative thought.

We describe CPS as a creative process. By *process* we mean a particular method of doing something, generally involving a number of steps or operations (Puccio, Murdock & Mance, 2006). Thus, we offer CPS as a deliberate creative process that is based on humans' natural intuitive response to open-ended problems and moves them from trial and error to targeted strategies. One of the advantages of CPS is that it makes our natural creative thinking more explicit by building on how the mind works when focused on predicaments and opportunities.

In our current view of CPS, the model features six steps that can be organized into three stages that reflect the natural creative process that humans engage in when responding to problems that do not have immediately clear solutions. The three stages that describe the natural flow of human creativity are Clarification, Transformation and Implementation. The first natural step in the creative process is to become aware of a predicament or opportunity. We refer to this as Clarification. Once a challenge or

opportunity is defined, we begin to generate ideas that are transformed through analysis into solutions. Finally, in the Implementation stage we consider what steps must be taken to successfully carry out our solution.

We believe these three stages reflect, at the broadest level, people's natural approach to open-ended challenges. For instance, Mintzberg, Duru and Theoret's (1976) examination of real-life problem solving yielded three major phases that they called "identification" (understanding the problem), "development" (creating potential solutions), and "selection" (deciding among the solutions). Other researchers have yielded similar results (Johnson & Jennings, 1963; Simon 1965; 1977), and in reviewing such studies Kaufmann (1988) concluded, "There is a striking agreement in the literature describing the phases of a problem solving event. Normally, three major phases are identified" (p. 98).

Our goal is to reflect this natural process in the structure of CPS and to use these three stages to organize the more deliberate steps featured within the CPS framework. There are seven steps within the CPS model. The initial step, or what we refer to as the executive step is found in the center of the model. We call this step Assessing the Situation. This is referred to as the executive step as it serves a metacognitive function. This step has two purposes: 1) to gather data about a predicament or opportunity; and 2) to use this data to make a decision about where to enter into the CPS framework. Through the diagnosis that is associated with Assessing the Situation an individual, team or organization can determine whether they need to begin the application of CPS with one of the steps associated with Clarification (i.e., Exploring the Vision and Formulating Challenges), Transformation (i.e., Exploring Ideas and Formulating Solutions) or Implementation (i.e., Exploring Acceptance and Formulating a Plan). So although CPS has a natural process flow, problem solvers can begin anywhere within the process depending on what they need. Descriptions of the function for each of the remaining steps are found in Table 1.

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We believe, and others agree, that there are real benefits associated with teaching students process skills through such deliberate creativity frameworks as CPS (see Scott, Leritz, & Mumford, 2004; Torrance, 1972, 1980). To capture the value of teaching thinking skills associated with creativity we will build off of an analogy put forward by de Bono (1994). de Bono, a well-known creativity writer and practitioner, used the operation of a car to describe why it is important to teach thinking. He suggested that our innate intelligence is like the horsepower of a car's engine.   The performance of a car does not depend solely on its horsepower, but rests largely on the skill of the person driving the car. de Bono suggested that thinking is analogous to how skillfully a driver operates the car. From this analogy de Bono argued that whether you have a powerful engine or not, high intelligence or not, it is critically important to learn how to think in order to maximize the effectiveness of your mental horsepower. We suggest that learning the process skills associated with the CPS framework is a direct way of enhancing the thinking skills associated with creativity.

We believe, and others agree (Presseisen, 2001; Swartz, 2001), that creative thinking is a higher-order thinking skill. In other words, creative thinking is a complex process that subsumes other basic thinking skills that are used for a particular purpose. Pressseisen (2001), for instance, provided the following definition of creative thinking, "Using basic thinking processes to develop or invent novel, aesthetic, constructive ideas or products from percepts as well as concepts" (p. 50). Perhaps the most significant development in our own efforts to refine CPS to date has been the articulation of the thinking skills associated with the steps in this creative process (Barbero-Switalski, 2003; Puccio, Murdock & Mance, 2005, 2006). Table 1 provides a description of the main thinking skill associated with the steps in CPS.

Several benefits can be derived from the identification of the thinking skills in CPS. They are:

- As a process designed to deliberately encourage creative thinking, the identification of the basic thinking skills in CPS parallels the suggestions that creative thinking is a higher order thinking skill.
- Allows educators and trainers to better describe the skills involved in CPS.

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- Enables educators and trainers to describe the types of thinking skills that are developed through CPS instruction.
- Permits educators and trainers to draw on, offer and organize a large variety of problem solving and decision making tools designed to carry out the respective thinking skills associated with the CPS steps (i.e., opens up the CPS process to be more inclusive of thinking tools not typically associated with this model).

In the next section we turn our attention to the literature that describes the use of CPS in schools and the results of such efforts.

Developing Creative Thinking in Schools

As early as 1916, Dewey (1944) described the importance of "fostering in schools good habits of thinking" (p. 152). At the same time, philosophical approaches to education such as Montessori (1964) articulated educational needs that were a natural complement to creative learning. Approaches like Montessori include an understanding of the importance of nurturing each child's unique creative self and have resulted in the purposeful teaching of deliberate creative processes in education. Like general trends in education, support for creative learning and teaching fluctuates. The will to maintain a consistent level of integration of creative thinking and problem solving in education has not occurred. Rather, creativity education varies in accordance to the degree to which the latest educational movements, philosophies and approaches embrace the importance of creative thinking and problem solving. We would argue it is possible to embrace creative learning in very diverse educational contexts that hold to a wide variety of educational philosophies if appreciation of the worth of creative learning and the recognition of the potential for positively impacting the education of children is recognized.

The current interest in multiple intelligences (Solomon, Powell & Gardner, 1999) provides an example of an educational movement that positively influences the pursuit of infusing creativity into education. Early work by Guilford (1968b, 1977) on the Structure-of-Intellect (SOI) broadened our view of the facets of intelligence and components of creativity, providing a richer view of our thinking related to the operations of divergent and convergent production, as well as structure of information in the form of transformations and implications. Taylor's (1968, 1986) seminal work in multiple talents also included creativity as an essential aspect of his theory. Taylor's theory, for example included productive thinking talent, defined as generating many, varied ideas or solutions and adding details to improve them. Using such theories as a foundation, a variety of education materials have been put in place to assist teachers in systematically fostering the creative thinking skills of their students. Meeker's (1969, 1973) practical applications of the SOI theory have served as the foundation to work carried out by SOI Systems internationally, an organization focused on using the SOI Model for Learning to assess and develop student skills, abilities and competencies to meet various learning situations. Schlichter's (1986) work delivers Taylor's Talents to the classroom through Talents Unlimited and serves as another example of a long-standing program with a strong creativity component. As current educational institutions embrace a wider view of intelligence, we would suggest there is promise that the need for and benefits of creativity becomes more evident to the wider educational establishment as a whole. This recognition of the importance and value in teaching creative thinking may lead educators to adopt existing instructional material in the field of creativity into their classrooms and/or encourage the creation of new material.

Creative Problem Solving Resources and Research in Education

Earlier we referred to the seminal work of Osborn and his introduction of the CPS model. Recall we indicated that Osborn's broad vision was to impact educational systems so that they would be more proactive in deliberately promoting creative thinking skills among their students. Initial work within educational systems focused on the development and use of CPS material and instruction with university students (Noller, Parnes, & Biondi; 1976; Parnes, 1967; Parnes & Meadow, 1959, 1960; Parnes, Noller, & Biondi, 1977). Since this early work, CPS material and instruction have been adopted in classrooms from kindergarten to high school. An example of some of the early CPS material originally developed for younger students in the 1970's and 1980's can be found in Eberle's (1996a) book on the SCAMPER tool, as well as Eberle and Stanish's (1996) CPS for kids.

CPS remains a popular methodology for promoting creative thinking in classrooms, as such teacher support material continues to be developed (e.g. Draze, 2005; Eberle, 1996b; Stanish & Eberle, 1997; Treffinger, 2000a, 2000b, 2000c; Treffinger & Nassab, 2000a, 2000b) and researchers continue to explore the impact and value of such instruction. Current trends in research based CPS support material for use with children include the development of specific materials designed for use at various levels of education. They include research with elementary age children (Duling, 1980; Puccio, 1994) and materials to teach CPS tools to children in the primary grades (Keller-Mathers & Puccio, 2000). They also include resources to train elementary age students in the complete CPS process using imaginary problems (Duling,1985,1986,1988,1989), as well

as resources to implement training using real problem solving with young children (Puccio, Keller-Mathers & Treffinger, 2000). Additional resources for older students include materials for applying CPS with teens (Elwell, 1986, 1993), as well as resources to support CPS training with older elementary and middle school students (Treffinger, 2000c; Treffinger & Nassab, 2000b).

CPS has been one of the most widely used creativity training programs in classrooms, but what has been the impact of such training? We now turn our attention to studies that have directly tested the effect of CPS training on students. Early research in creativity in education included Torrance's (1972) classic analysis of 142 creativity studies addressing the question "Can we teach children to think creatively?" Torrance specifically assessed the impact of creativity training associated with the following programs: Osborn-Parnes CPS process or modification; other disciplined approaches; complex programs like the Purdue Creativity Program; arts, media and reading; arrangements to foster conditions for creative thinking; teacher-classroom variables; motivation, reward and competition; and testing conditions. It was found that the 22 studies that used the Osborn-Parnes approach had a 91% success rate. Torrance (1987) later examined 166 additional studies and reported the results of 7 more CPS studies with an 88% success rate. Torrance reported that the success rate for CPS programs was higher than other creativity programs. Although he reported in the later study that the number of CPS studies in education declined, "it is somewhat misleading as many of the other types of training programs rely upon the Osborn-Parnes procedures as a general system and combine it with other strategies"(Torrance, 1987, p. 205).

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CPS continues to be a leading framework that has been adopted into various educational programs, such as Odyssey of the Mind and Destination Imagination. Since Torrance's assessment of the research, additional studies have examined the effects of deliberate training in CPS. The Future Problem Solving Program is an example of a long-standing research based program that utilizes CPS (Torrance & Torrance, 1978).

The research support for CPS in education is grounded in the classic Creative Studies Project (see Parnes, 1987; Parnes & Noller, 1972a, 1972b, 1973). The study involved an intensive, two-year sequence of undergraduate courses that included a variety of creativity models, theories and tools. This quasi-experimental study clearly demonstrated that instruction in creative thinking benefited students in the experimental group, those randomly assigned to the creativity courses, versus the control group, those who received no such training. Those who received creativity training out-performed the control group in a variety of ways, from measures of cognitive ability to tests of real-life problem solving skills. Although studies carried out since the Creative Studies Project have not matched the depth of this elaborate investigation, they have added to our understanding of the impact of CPS training, especially with younger students. For example, in Puccio's (1994) study of first graders, students were introduced to creativity concepts, trained in both divergent and convergent thinking as well as the stages of the CPS process. This investigation followed the Creative Learning Model (Treffinger, Isaksen & Firestien, 1982) with regard to training students in the CPS process first out of context, introducing tools, weaving tools into the process, and ultimately working on real problems. Puccio found that as a result of 12 CPS sessions guided by a trained facilitator, the students were able to use the CPS process to solve real problems.

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Two studies at the middle school level focused on the effectiveness of CPS training on problem solving abilities (Baer, 1988; Schack, 1993). In each study, students were trained in the CPS process by working on out of context and/or subject based problems, as well as student-generated challenges. Each study is described in more detail below.

Baer (1988) examined the effects of creativity training on 48 students from two classes of high ability 8th graders. Instruction for the experimental group consisted of CPS training delivered over three days and two nights at an outdoor school. Students worked on both subject specific problems, as well as challenges that related to students' experiences outside of school. A pretest and post-test, consisted of four parts focused on Data-finding, Problem-Finding, Idea-Finding and Solution-Finding activities to assess the students' ability to use these stages of the CPS process. The post-test was administered six months after the training. Average gains from the pre to the post were 1.5% for the total battery for the control group and 19.1% for the experimental group. Baer found that the "increase in the problem-solving skills of the experimental group was both substantial and statistically significant" (p. 191).

Schack (1993) examined the effects of CPS curriculum on 276 6th, 7th and 8th grade students. Students participated in 45 lessons on group dynamics, instruction in the CPS tools and a six stage CPS process. In the final part of the unit students used CPS to solve real problems. Experimental and control groups were matched by grade level. Furthermore, the investigation considered whether ability level would show different training effects, therefore experimental and control groups were also drawn from students involved in the gifted and honors programs. Students were assessed on five areas of

problem solving ability before and after training. They included problem fluency, solution fluency, flexibility, originality, and use of criteria. The means for the treatment group showed greater gains in overall problem solving. There were no differences among regular, honors and gifted students, indicating that students of all ability levels can benefit from CPS training.

Additional studies used the CPS process as the main intervention but integrated into other forms of instruction. These include two studies by McCluskey and his colleagues (McCluskey, Baker & McCluskey, 2005) in which at risk-high teenagers were trained in CPS and received mentoring and career counseling. Cramond, Martin and Shaw (1990) conducted a study using CPS training and transfer skills, focusing on whether students could transfer their training to other situations. Manning (1984), in a study of reading disabled third graders, examined CPS and cognitive monitoring as an aid to oral comprehension. Each of these studies is described below.

Lost Prizes (McCluskey, Baker, O'Hagen & Treffinger, 1998), a three-year study of at-risk teens in Canada, involved 88 talented troubled high school dropouts from three school districts. The project focused on CPS training combined with career counseling and mentoring to "reclaim" these at-risk students; that is the goal was to enable these teens to make better future choices for their education, career and life. Students received CPS training at off-school sites from a trained facilitator as part of a month long for credit project followed by a job placement experience. The school districts involved worked cooperatively with business partners who were also given the opportunity to receive training in mentoring and CPS. Sixty-five percent of the students who participated went

on to complete high school and either entered post secondary programs or obtained full time employment.

A more recent study with the same school districts, the Northern Lights Project, targeted the plight of disenfranchised Canadian Aboriginal youth (McCluskey, Baker & McCluskey, 2005). The project, like Lost Prizes, provided CPS training and work experiences for talented youth. The curriculum also incorporated content on native culture, which included a focus on traditional values and heritage. At the start of this study these students were to be removed from school for academic, behavioral or attendance issues. As a result of the program, 38 or 65% of the original 58 students returned to school, graduated or found employment.

Manning (1984) examined whether problem solving instruction would positively influence oral comprehensive among 100 reading disabled third graders. Four groups consisting of a control group, a CPS group, a Cognitive Monitoring group and a group who received both treatments were administered the Boehm Test of Basic Concepts. The CPS training involved 30-minute CPS training session carried out over 10 consecutive school days. The results for the treatments showed significantly higher mean scores on the Boehm test than the control with the combination group showing consistently higher mean scores than the others.

Cramond, Martin and Shaw (1990) examined the generalizability of CPS training to real world problems presented outside of the context of the training session and whether transfer skills would enhance the value of CPS training. Seventy-five gifted middle school students were assigned to either CPS training, CPS training with transfer strategies infused or the control group who received training in various memory,

analogical and logic activities. Transfer strategies included strategies to assist with

transfer when similar problems are encountered. It also included "high-road" transfer

strategies to assist with the conscious abstraction of an idea and application with contexts

that are dissimilar to training problems. Students in the transfer group also participated in

activities that would better enhance their ability to monitor themselves while engaged in

problem solving efforts. The students in the transfer group were trained to differentiate

between problems appropriate for exploring many potential options through the use of the

CPS process and those, such as logic problems, that employed other strategies. Each

group of students received two 40-minute training sessions a week for eight weeks.

Students were individually observed solving six real world problems after the training,

three that were appropriate to CPS and three that were not. Each student was interviewed

after the testing to confirm observations of the strategies and steps of the CPS process

used. The transfer group had the highest percentage of students applying aspects of the

CPS process, followed by the CPS group and then the controls. There was a statistically

significant difference between the transfer group and the control group, with the transfer

group more often applying steps of the CPS process. The authors concluded that the

incorporation of transfer skills enhances the use of CPS after training.

As stated earlier, we believe there is a need for creative thinking and problem

solving in education. In an increasing complex world, the ability to acquire and utilize

knowledge combined with the ability to produce new thinking will be essential. Studies

carried out thus far indicate that CPS training can go a long way in developing the types

of problem solving and thinking skills required to be personally and professionally

successful in the new millennium. We would further contend that CPS training does

much to improve individuals' leadership skills. It is becoming apparent that because leaders face complex problems, they need to be skillful creative problem solvers. In the concluding section of this paper we explore the link between CPS and leadership.

Conclusion: Developing Creative Leaders

A relatively new area of exploration with respect to creativity is the link between creative thinking and leadership. We believe there are some conceptual points of convergence between the fields of leadership and creativity. In his review of leadership theories Northouse (2004) presented four fundamental components of leadership:

- Leadership is a process;
- Leadership involves influence;
- Leadership occurs within a group context; and
- Leadership involves goal attainment (p. 3).

These observations led Northouse (2004) to define leadership as "a process whereby an individual influences a group of individuals to achieve a common goal" (p. 3). This contemporary view of leadership seems to draw strong connections to what is the essence of creativity. Looking back at the bullet points regarding the fundamental aspects of leadership, one could easily replace the word "Leadership" with "Creativity" and still maintain meaning for each of these four points. Creativity is viewed as a process that enables individuals to address significant challenges as they move towards a goal.

Perhaps the most direct connection between creativity and leadership has been forged through the work of Mumford and his colleagues (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000). In their capacity model of leadership these authors argued that leaders are responsible for solving complex social problems. According to Mumford and his colleagues complex problems are characterized by three qualities. They are ill-defined, ambiguous and novel. To solve such problems Mumford and his colleagues have argued that leaders must have well developed creative problem solving skills. As they concluded, "The available evidence indicates that creative problem solving may

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indeed represent an important influence on leader performance" (Mumford et al., 2000, p. 18).

Since leaders are called upon to solve complex problems, and since CPS is a deliberate method for addressing complex problems that require a solution to be invented, we maintain that CPS training can do much by way of leadership development in the schools (see Puccio, Murdock & Mance, 2006). Thus, we would argue that if schools believe their role is to help produce future leaders for society, it would seem wise to include creativity and CPS instruction in their curricula. If we wish our students to be able to successfully facilitate others towards meaningful goals by overcoming problems that are ill-defined, ambiguous and novel, it would seem natural to marry the focus on gaining knowledge with the kinds of process skills that will enable them to skillfully address complex problems.

The ultimate aim of our educational systems is to develop individuals who have the skills to productively contribute to society. The fast-pace world we live in today places a demand on individuals to be able to cope with change or to lead change. Creative thinking is the wellspring for change. Therefore, schools would be wise to explicitly weave creative thinking instruction into their curricula. By doing so they can become much more successful at preparing young people to both respond effectively to change and to become effective leaders of change.

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Table 1 Major Thinking Skills Associated with CPS

Step	Assessing the Situation (executive step)	Exploring the Vision	Formulating Challenges	Exploring Ideas	Formulating Solutions	Exploring Acceptance	Formulating a Plan
Purpose	1. To describe and identify relevant data 2. To determine next process step	To develop a vision of a desired outcome	To identify the gaps that must be closed to achieve the desired outcome	To generate novel ideas that address important challenges	To move from ideas to solutions	To increase the likelihood of success	To develop an implementa-tion plan
Thinking Skill	**Diagnostic Thinking** Making a careful examination of a situation, describing the nature of a problem and making decisions about appropriate process steps to be taken.	**Visionary Thinking** Articulating a vivid image of what you desire to create.	**Strategic Thinking** Identifying the critical issues that must be addressed and pathways needed to move towards the desired future.	**Ideational Thinking** Producing original mental images and thoughts that respond to important challenges.	**Evaluative Thinking** Assessing the reasonable-ness and quality of ideas in order to develop workable solutions.	**Contextual Thinking** Under-standing the interrelated conditions and circum-stances that will support or hinder success.	**Tactical Thinking** Devising a plan that includes specific and measurable steps for attaining a desired end and methods for monitoring its effectiveness.

Draft Chapter