Creative Problem Solving (CPS): Powerful Tools for Managing Change and Developing Talent

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Abstract

Creative Problem Solving (CPS) offers a powerful, practical set of tools for people of all ages to learn and apply. In educational settings, CPS is valuable for adults and for students to empower individuals and groups to think creatively and critically, deal with complex, open-ended problems, and manage change; CPS also plays a role in promoting talent recognition and development. This article describes the foundations for understanding the CPS system and the reasons for its importance in education, summarizes major influences on the development and evolution of CPS over more than five decades, summarizes current educational applications, and outlines a number of current and emerging trends and issues for research, development, and practice.

Keywords: Creativity, creative thinking, critical thinking, problem solving, CPS, thinking skills, teaching thinking.

Introduction

Once upon a time, educators might have said to their students, "If you will simply pay close attention to what I am going to teach you, you will learn everything you will need to know for a successful life." Alas, stories that begin, "Once upon a time..." are fairy tales. It's doubtful that such a message was ever true, but we can be certain that it is not true today. We do not know all the knowledge, information, or content that today's students will need, or the answers to the questions they will face. Indeed, increasingly, we do not even know the questions (Treffinger, in press).

Creativity and CPS are important in helping students deal effectively, independently, and resourcefully with a wide variety of complex opportunities and challenges. In preparing students for the increasingly complex challenges of the workplace, they can also have a very powerful, positive impact on students' personal lives and careers. Through knowledge of CPS tools and their ability to use them, students discover rich and varied new opportunities for personal growth and productivity, through which students discover and their passions, discovering and developing ways to be at their best. When people in a group talk about the best, most powerful learning experiences they have ever had, it is common for them to describe their encounters with creative learning. When people discover and use their creativity, they find that they feel healthier, happier, and more productive in a variety of ways (Treffinger, 2001).

Engagement in creativity and CPS is demanding, but also rewarding. After a period of extended work on a creative project, or in a problem-solving group, it is very common for people to say, for example, "I'm exhausted; I would never have believed thinking could be such hard work - but it was worth it!" They experience this paradox: they're drained from the amount of focus and effort they invested in their work, but at the same time, they're energized and excited by the results of that work, and they're eager to carry out their action plans or put their new ideas to work.

Creativity contributes to our efforts to bring liveliness, excitement, and challenge to any work project - in school, or on the job. Educators and employers today are increasingly aware of the powerful benefits that come from creative engagement in a task, and students or employees who feel ownership in what they are doing will pursue it more energetically and diligently, over sustained periods of time. Creative learning engages people in tasks, and brings a sense of commitment and renewal to one's work. We need to help students to accept the challenges that extend beyond learning, recalling, and reciting facts or doing well on basic standardized tests. In education today, and particularly through gifted and talented programming, we can help many students to become people who will be able to find, learn, and apply new knowledge to complex, novel, open-ended challenges; to make the most of the opportunities they discover or create in the future; and to proceed confidently and competently into outstanding accomplishments and productivity in the future.

It is possible to provide students today with thinker friendly tools for creative and critical thinking,

problem solving, and change management. These tools are practical, proven, powerful, and portable. Let us consider each of these attributes briefly.

Practical

Perhaps the most important attribute of these tools is their practicality. They are not just theories about what someone might do. They work, and people can - and do! - really use them; we might say they are user-friendly.

Proven

We make no claim to having invented (or discovered) many of these tools for productive thinking; indeed, the use of deliberate tools for generating and focusing options might be documented across centuries and civilizations. Within our CPS framework, the use of these tools builds on more than five decades of research, development, and practice (Isaksen & Treffinger, 2004). The term brainstorming, for example - one of the most commonly known tools that has been incorporated into everyday conversation across the world - was introduced by Osborn more than 50 years ago in his book, *Applied Imagination* (1953).

These tools have been used for decades in research and in practice.

Powerful

CPS tools can be used in many different settings or situations, and they are effective. They help individuals or groups to achieve successful results or outcomes. It is important for teachers, and for students, to recognize that the tools are not just academic exercises, time-fillers, or clever workbook activities; they are important to people in their personal life and in the world of work as well.

Portable

These tools can and should be taught to students of all ages, in all grade levels, and across all disciplines. In a very real way, they can be picked up and carried from place to place, task to task, or from very simple challenges to very complex, demanding, long-term concerns. They can be used easily, with only a minimum of training, preparation, and materials.

Understanding and Defining Creativity

There are many approaches to studying creativity and problem solving, including more than 100 definitions of creativity in the literature, for example (Treffinger, 2000a). We have used the example of a lake to organize and explain many perspectives on the nature and sources of creativity (e.g., Treffinger, Isaksen, & Firestien, 1983; Treffinger, 2000b). This example is illustrated in Figure 1 (page 10).

The water in a lake has many sources. It may come from rain, from underground springs, or from any of a number of tributaries, for example. As water collects in the lake, those separate sources may be synthesized, and we would describe a bucket of water gathered from the lake simply as lake water.

Similarly, creativity has many sources, even though we commonly use that single word, creativity for it. In reality, of course, work on creativity (in research and practice) is often not being carried on in the deepest waters in the center of the lake, to extend the metaphor, but in one of the tributaries, although the word creativity may still be used to describe the focus of the work.

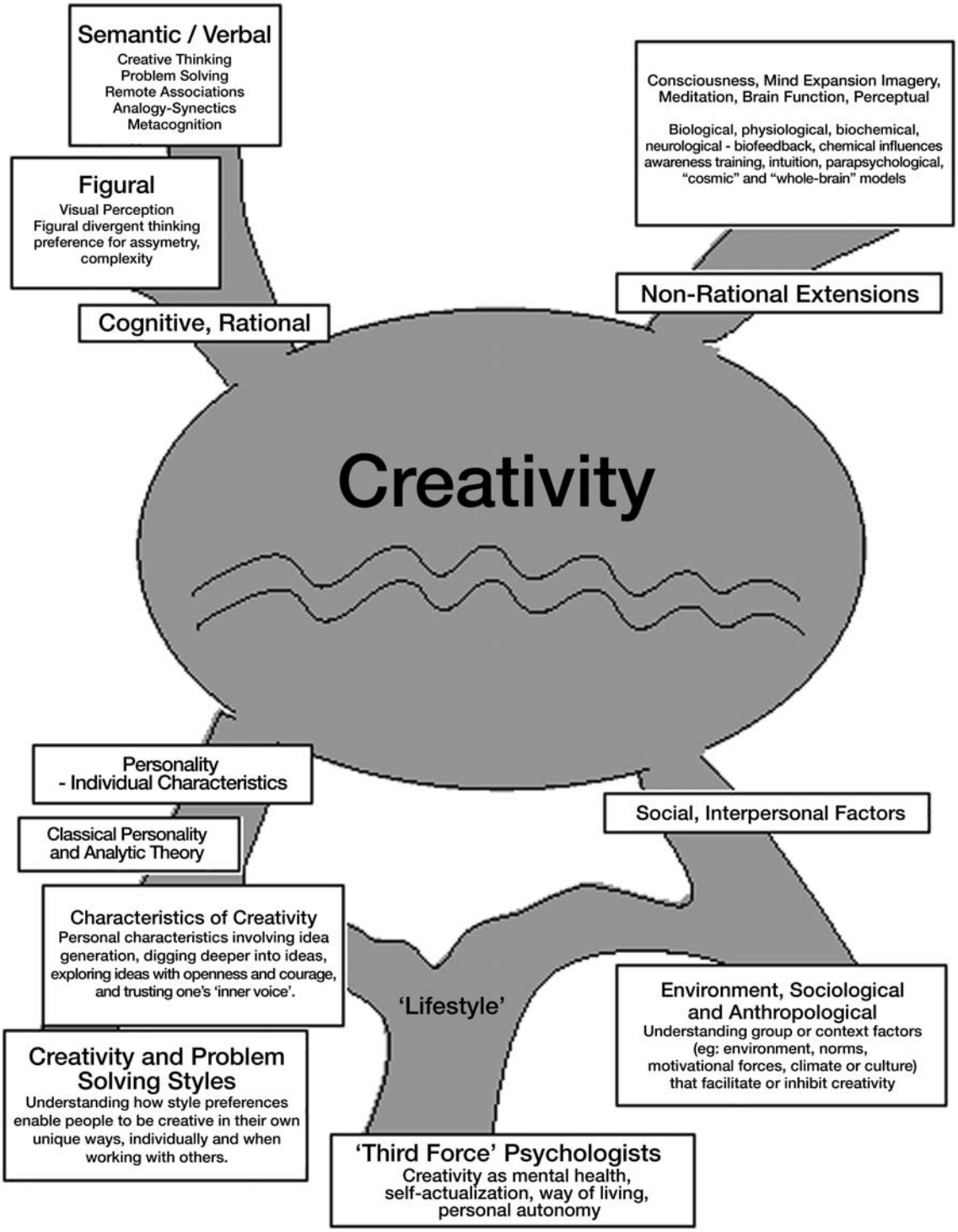
In this article, we'll focus on one such perspective: Creative Problem Solving. Our work has generally focused on the stream from Figure 1 that is characterized as cognitive, rational, although, through its long history of research, development, and practice, we have made deliberate efforts to be informed about and responsive to contributions from other perspectives. Let us examine very briefly the history, present status, and implications of our stream in the lake and its implications

Creative and Critical Thinking

Our approach builds on a foundation that incorporates both creative and critical thinking. Unfortunately, these are often seen (or stereotyped) as opposites, poles apart and incompatible, viewing the creative thinker as one who is wild and zany, eccentric or at least a little bit weird or strange, and who thrives on off the wall ideas that are usually impractical, and the critical thinker as serious, deep, analytical, and impersonal.

We hold a different view, arguing instead that these are two complementary, mutually important ways of thinking. Individuals and groups need to be able to use both creative and critical thinking, working together in harmony (or, as we describe it, as the heartbeat of the process) in order to be effective problem solvers and managers of change. Generating many ideas will not be enough by itself to help a person or group solve a problem. Similarly, if people rely only on the focusing side, they may have too few and too limited a range of possibilities from which to choose.

Treffinger, Isaksen, and Stead-Dorval (2006) defined creative and critical thinking as illustrated in the following chart (page 10).



Creative Thinking

Encountering gaps, paradoxes, opportunities, challenges, or concerns; then searching for meaningful new connections by generating -

- many possibilities;
- varied possibilities (from different viewpoints or perspectives);
- unusual or original possibilities; and
- details to expand or enrich possibilities.

Critical Thinking

Examining possibilities carefully, fairly, and constructively; then focusing your thoughts and actions by -

- organizing and analyzing possibilities;
- refining and developing promising possibilities;
- ranking or prioritizing options; and
- choosing or deciding on certain options.

Figure 1: The 'Lake' of Creativity (Treffinger, 2000b; reproduced by permission).

Basic Guidelines and Tools for Generating and Focusing Options

Both generating (using creative thinking) and focusing (using critical thinking) also involve learning and applying specific guidelines (attitudes and habits of mind that support effective thinking) and tools.

What is a tool? The term is an ordinary part of everyday conversation. We have tools in our home, in the yard or garden, or for use in hobbies, and the tools of our trade is a familiar phrase for most people. Simply, a tool is an object we use to help us do a task or job. There are many different kinds and categories of tools and we make a number of more specific distinctions among them with ease, based on where we use them or the functions they serve. In education, we deal with another kind of tools: tools for the mind. These include many tools that we teach to make various kinds of academic work easier, more efficient, or more productive for students (e.g., tools for research, note-taking, or organizing information). In CPS, building on our basic definitions, we identify two basic sets of tools: one for generating options and another for focusing our thinking. These are summarized in Figure 2 (below).

Generating Tools

Individuals or groups use these tools to produce many, varied, or unusual possibilities, to develop new and interesting combinations of possibilities, or to add richness and detail to new possibilities.

Tools for Generating Options	Tools for Focusing Options
Brainstorming and its variations. Generating many, varied, or unusual options for an open-ended task or question. (Variations include Brainwriting and Brainstorming with Post-It® Notes.)	**Hits and Hot Spots.** Selecting promising or intriguing possibilities (identifying hits) and clustering, categorizing, organizing, or compressing them in meaningful ways (finding hot spots).
Force-Fitting. Using objects or words that seem unrelated to the task or problem, or to each other, to create new possibilities or connections.	**ALoU: Refining and Developing.** Using a deliberate, constructive approach to strengthening or improving options, by considering *Advantages*, *Limitations* (and ways to overcome them), and *Unique* features.
Attribute Listing. Using the core elements or attributes of a task or challenge as a springboard for generating novel directions or improvements.	**PCA: Paired Comparison Analysis.** Setting priorities or ranking options through a systematic analysis of all possible combinations.
SCAMPER. Applying a checklist of action words or phrases (idea-spurring questions) to evoke or trigger new or varied possibilities.	**Sequencing: SML.** Organizing and focusing options by considering short, medium, or long-term actions.
Morphological Matrix. An analytical tool for identifying the key parameters of a task, generating possibilities for each parameter, and then investigating possible combinations (mixing and matching).	**Evaluation Matrix.** Using specific criteria in a systematic manner to evaluate each of several options or possibilities to guide judgment and selection of options.

Figure 2: The Creative Problem Solver's basic toolbox.

When using these tools, it is important to follow four basic guidelines (Treffinger, Isaksen, & Stead-Dorval, 2006). These are:

1. *Defer Judgment.* When generating options, separate generating from judging, directing effort and energy to producing possibilities that can be judged later.

2. *Seek Quantity.* The more options a person or group can generate, the greater the likelihood that at least some of those possibilities will be intriguing and potentially useful.

3. *Encourage All Possibilities.* Even possibilities that might seem wild or silly might serve as a springboard for original and powerful new connections.

4. *Look for Combinations.* Increase the quantity and quality of options by building on the thinking of others and by seeing new combinations.

Brainstorming is an example of a generating tool and in fact, is probably the most widely known tool (but also often the most misunderstood and misused tool, too). Many people use this term as if it were a synonym for a general conversation, discussion, or exchange of views.

It is more accurate, however, to view brainstorming as a specific tool, in which a person or a group follows the four guidelines described above to search for many possible responses to an open-ended task or question.

As illustrated in Figure 2, there are also several other tools for generating options (e.g., Treffinger, Nassab, Schoonover, Selby, Shepardson, Wittig, & Young, 2006).

Focusing Tools

The focusing set includes several tools for analyzing, organizing, refining, developing, prioritizing, evaluating, or selecting options. Focusing also involves four broad guidelines (Treffinger, Isaksen, & Stead-Dorval, 2006), which are:

1. *Use Affirmative Judgment.* When focusing their thinking, examine options carefully but constructively, placing more emphasis on screening, supporting, or selecting options than merely on criticizing them.

2. *Be Deliberate.* Consider the purpose or need for focusing: to select a single solution, to rank order or prioritize several options, to examine ideas carefully with very detailed criteria, to refine or strengthen options, or to create a sequence of steps or actions. Each purpose may involve deliberately selecting and applying a specific focusing tool.

3. *Consider Novelty.* When seeking a novel or original solution or response, focus deliberately on that dimension when evaluating possible solutions.

4. *Stay on Course.* Keep the goals and purposes of the task clearly in sight and ensure that the options are evaluated in relation to their relevance and importance for the goal at hand.

As illustrated in Figure 2, there are also several specific focusing tools.

The basic tools for generating and focusing options can be applied independently and they can easily be incorporated into a variety of content or curriculum areas or linked to content standards (e.g., Treffinger, Nassab, Schoonover, Selby, Shepardson, Wittig, and Young, 2004a, 2004b, 2004c).

The Creative Problem Solving Framework

There are also situations in which it is necessary to go beyond the basic tools. For opportunities and challenges that are complex, ambiguous, important, and open-ended, individuals and groups often need to employ a systematic approach to attain clarity about the problem, to generate possible solutions, or to prepare for action and successful implementation. Such complex tasks call for applications of the Creative Problem Solving (CPS Version 6.1™) framework (Isaksen, Dorval, & Treffinger, 2000; Treffinger, Isaksen, & Stead-Dorval, 2006; Treffinger, Nassab, Schoonover, Selby, Shepardson, Wittig, & Young, 2006). Figure 3 (over the page) presents our current graphic representation of the CPS model.

CPS involves three process components, with six specific stages, and a management component with two stages. The process components and their specific stages are:

Understanding the Challenge. This component involves three stages that contribute to defining a constructive goal or direction for problem solving (*Constructing Opportunities*), identify the important data involved in the task (*Exploring Data*), and define a specific problem statement to guide one's search for ideas (*Framing Problems*).

Generating Ideas. This component includes one stage of the same name. *Generating Ideas* involves searching for many, varied, original, or detailed ideas for dealing with or responding to an open-ended task.

Preparing for Action. This component consists of two stages. The *Developing Solutions* stage helps problem solvers transform ideas into promising solutions, and the *Building Acceptance* stage involves assessing factors that will support or inhibit successful implementation and the development of a specific Plan of Action.

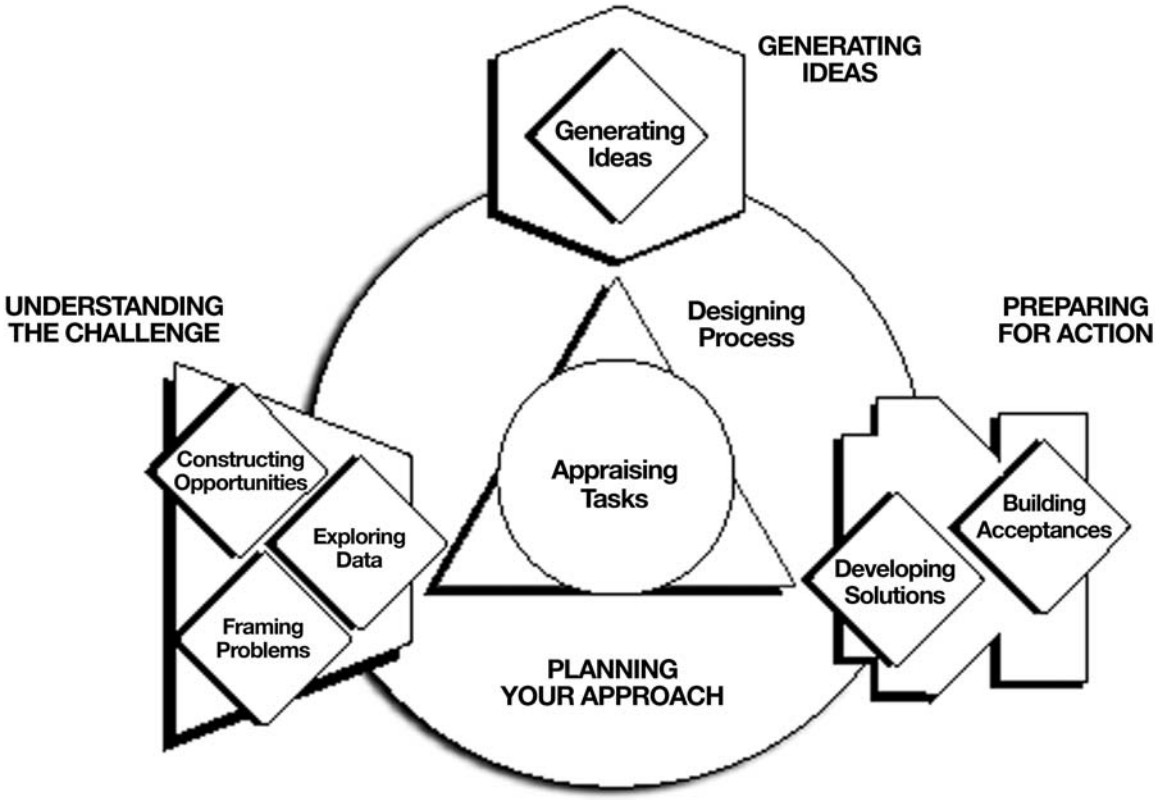


Figure 3: The Creative Problem Solving Framework: CPS Version 6.1.™

The management component, **Planning Your Approach**, includes two specific stages. *Appaising Tasks* guides individuals or groups in examining people, content, context, and methods in order to assess the appropriateness of CPS for use with a specific task. One important element of *Appraising Tasks* involves using information about creativity characteristics (e.g., Treffinger, Young, Selby, & Shepardson, 2002) and problem-solving styles (Selby, Treffinger, Isaksen, & Lauer, 2004) to customize or personalize effective applications of CPS. When CPS is an appropriate choice of methods, the *Designing Process* stage guides specific choices of components, stages, and tools.

Five Decades of Research and Development on CPS

Today's CPS framework reflects a gradual and incremental evolution in understanding and describing the process, now spanning more than five decades, building on the theory, research, and rich practical experiences of many individuals and groups. Although CPS represents an approach that is clearly in the cognitive, rational stream in Figure 1, it now incorporates many contributions from other perspectives as well. A brief survey of its history will illuminate the ways in which CPS has evolved over time, and will also establish a foundation for understanding its implications for practice today as well as for framing future opportunities and directions.

Alex F. Osborn's (1953) writing on brainstorming and creativity served as the foundation for the CPS model. The model's early development was also influenced by other work in the 1950's and 1960's on creativity and creative thinking (e.g., Gowan, 1972; Guilford, 1950, 1967a; Torrance, 1962, 1963, 1965) and broadening conceptions of human intelligence (e.g., Guilford, 1959, 1967b; Taylor, 1963, 1968), clarifying the need for an explicit, well-defined process. In the 1960's, the emphasis on divergent thinking as an important and fundamental element of creativity and with it, a focus on the central role of brainstorming, influenced the early presentations of the CPS model (e.g., Parnes, 1967).

From the late 1960's and into the 1970's, work on CPS focused on elaborating the CPS model for instructional purposes (e.g., Parnes & Noller, 1972a, 1972b, 1973a, 1973b; Parnes, Noller, & Biondi, 1976; Noller, Parnes, & Biondi, 1977), while concurrent research and development on creativity in education also focused on

instructional programs and packages to foster creativity (e.g., Callahan, 1978; Guilford, 1975; Stein, 1974, 1975; Torrance, Bruch, & Torrance, 1976; Torrance, 1978, 1979; Torrance & Torrance, 1978; Treffinger & Feldhusen, 1977). Efforts to refine and develop CPS for instructional purposes were also influenced by research on personal characteristics, extending work on CPS outward from the cognitive, rational strand of Figure 1 into more complex efforts to link person and process (e.g., MacKinnon, 1962, 1967, 1978)

As research, development, and practical applications of CPS continued into the 1980's, work began to focus on expanding and refining the CPS model. These efforts included clarifications of the language and structure of CPS (e.g., adding a sixth stage, known as Mess-Finding, clarifying the importance of problem ownership, giving explicit attention to diverging and converging in each CPS stage, broadening Fact-Finding to Data-Finding, and beginning to expand our awareness of the importance of Person, Situation, and Task; Isaksen & Treffinger, 1985; Treffinger, Isaksen, & Firestien, 1982).

The CPS framework continues to evolve through ongoing research, development, and practice, currently spanning more than 25 countries worldwide, with children, adolescents, and adults. Since the 1990s, research and development on the CPS process framework itself has continued to focus on moving from linear, prescriptive views of CPS to a more natural, descriptive view, in which the CPS components and stages are dynamic and can be selected and applied independently or in concert. Efforts to link person, process, and situation have also moved forward, enhancing our ability to personalize or customize process applications for individuals and groups for varied tasks, settings, and circumstances (e.g., Isaksen, Dorval, & Treffinger, 1994, 2000; Isaksen, Lauer, & Ekvall, 1999; Selby, Treffinger, Isaksen, & Lauer, 2004; Treffinger, Selby, Isaksen, & Crumel, 2007).

Educational Applications of CPS

The basic tools, stages, and components of CPS can all be helpful to educators who work with students of all ages and across many content areas. In addition, we have found that the same tools can be just as important for adults to use themselves, to deal with such tasks as school improvement, for example (Treffinger, 2002), or curriculum development, as to teach and apply with students in regular education, special education, and gifted education (Treffinger, 2004; Treffinger & Isaksen, 2005; Treffinger, Selby, & Isaksen, in press). Many published resources provide additional information about these tools and their applications for children in the primary grades (e.g., Keller-Mathers & Puccio, 2000), the middle and secondary grades (e.g., Treffinger & Nassab, 2000, 2005), or adults (e.g., Isaksen, Dorval, & Treffinger, 1998). Instructional resources also exist for teaching students the CPS tools, stages, and components and applying them to real problems and challenges (e.g., Treffinger, et al., 2006). Structured programs such as the Future Problem Solving International Program (www.fpspi.org; see, for example: Tallent-Runnels & Yarbrough, 1992), Destination ImagiNation© (www.destinationimagination.org; see for example, Bognar, Guy, Purifico, Redmond, Schoonmaker, Schoonover, & Treffinger, 2003; Treffinger & Young, 2002), or inventing programs such as Camp Invention (www.invent.org; see, for example, Saxon, Treffinger, Young, & Wittig, 2003) also provide important opportunities to encourage students to learn and apply CPS to creative challenges and realistic problems of the present and future.

Ongoing Research and Development Initiatives

The commitment to continuous improvement as well as innovation in understanding and applying CPS that characterized the first five decades of research and development continues today as well.

Although early versions of CPS presented the process as a linear, sequential step/stage model, CPS has become a more natural and flexible framework. Current views of the CPS framework lead us to call into question the prescriptive, step-by-step lockstep for problem solving (or for scientific method or research and inquiry skills) that has been commonplace from elementary school to graduate school. Experienced problem solvers, like their academic research colleagues, have long questioned simplistic summaries of the [fixed, prescribed] steps for problem solving. A contemporary approach to CPS recognizes that an effective process framework must be flexible and dynamic. While initial instruction in CPS may be more linear and sequential in nature, we should also accept the challenge to guide students in more natural, flexible, and dynamic ways of applying CPS. Students can learn to examine

a complex, open-ended problem or challenge carefully, to assess the relevance and potential value of applying any of the CPS components, stages, or tools, and then to proceed accordingly. They can also learn to monitor the effectiveness of their decisions and plans, and to adjust their process choices and strategies as they continue to work toward a solution.

While early research and development emphasized the organization of the process and the formulation of instructional models and materials, we continue to be concerned with the questions of people, context, desired results, and their interactions as they influence the effectiveness or impact of CPS. The question of what works best, for whom, and under what conditions led us to examine the nature and role of profiling for CPS (Isaksen, Puccio, & Treffinger, 1993) and to study the interactions of person and process in new ways. We have learned that problem solving style— one's personal orientation to change, one's preferred manner of processing information, and one's preferred ways of making decisions— has direct and important implications for learning and applying CPS (Selby, Treffinger, Isaksen, & Lauer, 2004; Treffinger, Selby, Isaksen, & Crumel, 2007). We have also learned that the context or climate for creativity in many kinds of groups or organizations will be influenced, positively or negatively, by specific, measurable factors (Isaksen, Dorval, & Treffinger, 2000).

Modern technology also leads to expanding horizons for research and development on the role of technology (e.g., web-based or distance learning applications and virtual collaboration and teamwork) in effective process instruction, and to the creation and testing of new resources that enable individuals and teams to learn and apply CPS autonomously.

Implications for Talent Development and Gifted Education

Advances in research, development, and CPS practice in educational settings also relate to several important issues and themes in contemporary gifted education and talent development (Treffinger, 2003b). The implications include:

1. A working knowledge of CPS helps people discover, apply, and extend their natural strengths and talents. Many contemporary understandings of giftedness and talent emphasize creativity productivity and the person's ability to use knowledge rather than just to recall and reproduce it (e.g., Runzulli, 1978; Dunn, Dunn, & Treffinger, 1992). When people know and can use CPS have confidence and skills that enable them to be confident in their ability to work successfully on complex tasks and challenges. They are able to pursue their personal interests or passions, and to attain successful results. Often, we have learned from experience, they are able to exceed expectations based on arbitrary test score categorizations and labels, and to accomplish results that no one would have realized would be possible for them to attain. The power and impact of CPS for discovering and developing talents has also been demonstrated by the work of McCluskey and his associates with at-risk students (e.g., McCluskey, Baker, Bergsgaard, & McCluskey, 2001; McCluskey, Baker, O'Hagan, & Treffinger, 1985; see also, Treffinger, 2003a). CPS can be a powerful set of tools for affirming the uniqueness and talent potentials in all people.
2. Process tools are building blocks for productivity across many talent domains. Some individuals focus their creative efforts in a single talent area or domain, although it is not uncommon for many people to be successful and productive in applying their creativity across several domains, or to be multi-talented. CPS tools can be applied successfully in any content or talent area, and so provide a common language for effective communication and a set of functional skills that can serve as a foundation for productivity.
3. Viewing problems as opportunities and challenges, seeing them as possibilities instead of obstacles, makes challenging visions attainable. CPS contributes to a sense of purpose and direction in life and work. Although published resources that offer exercises and activities keyed to each of the CPS stages may be useful and valuable in the early stages of instruction, it is important to keep in mind that such contrived instructional exercises and activities are not, in and of themselves, the important ends or outcomes. The more important ultimate goals of both process instruction and talent development are to enable students to improve their ability to deal successfully and creatively

with high-level real problems and challenges. The most powerful applications of CPS for students involve them in dealing with real opportunities and challenges— for which they will carry out their solutions in real life— rather than hypothetical solutions to contrived exercises. The challenge of engaging students in powerful, real-life applications of CPS is especially significant in the maturing field of gifted and talented education. Programming for talent development today involves moving beyond pull out programs in which there may be over-reliance on divergent thinking exercises and activities, moving toward more powerful and sustained opportunities for students to engage in more complex and challenging investigations (e.g., Renzulli, Gentry, & Reis, 2003; Treffinger, Young, Nassab, & Wittig, 2004). Students benefit from the engagement and commitment to action that result from opportunities to carry out first-hand inquiry, and from involvement in problems and challenges for which they will actually carry out solutions. The Future Problem Solving Program's Community Problem Solving component illustrates one powerful example of the difference between learning about problems and actually being real-life problem-solvers.

4. CPS provides a vehicle that enables people to move easily between personal or individual creative effort and effective collaboration and teamwork. Although giftedness and talents are usually viewed as personal strengths, inherent in the individual, the importance of teamwork and collaboration are realities of today's world. Individuals can use CPS tools in their own personal creative efforts, but those tools are also powerful methods for group productivity.
5. There can be linkages between CPS and today's emphasis on standards, but CPS also challenges us to look to higher levels. Current emphases on standards and standards-based instruction, which too often seem to focus only on lower-level thinking and testing, can actually provide an opportunity for extending applications of CPS tools to academic content areas. It is readily possible to link many generating and focusing tools with content standards (e.g., Treffinger, Nassab, Schoonover, Selby, Shepardson, Wittig, & Young, 2004a, 2004b, 2004c). Content standards in any curriculum area can be treated as topics to be "covered" through memorization and drill, but they can be made more challenging and stimulating when specific thinking tools are used to address the same standards. Providing instruction in CPS tools for all students provides a process foundation that high-ability students can use as a springboard for more complex learning and problem solving. In addition, as all students have opportunities to learn and apply basic CPS tools, we may begin to see strengths and talents in students among whom such abilities may not previously have been evident. A contemporary approach to teaching and applying CPS in programming for talent development involves a rich tapestry of cognitive skills and tools, personal characteristics and styles, a supportive environment, attention to outcomes that extend beyond recognition and recall, and opportunities to work on real-life problems and challenges.

Conclusion

Helping students to learn and apply practical tools for generating ideas and for focusing their thinking, in addition to applying the components and stages of CPS, will enhance student learning in powerful ways that extend beyond memorization and recall. Even in times in which there is great emphasis on basic learning and doing well on standardized tests— indeed, particularly in such times— it remains important to balance the emphasis between process and content in teaching and learning. Students who are competent in the basics of productive thinking and CPS as well as the basics of content areas will be lifelong learners, creators, and problem solvers who can live and work effectively in a world of constant change. They are learners who will be prepared for the important challenges of our world today— a world in which we have a high need for creative efforts and accomplishments. Creative problem solvers are important to our world today for many reasons. There are symphonies to compose, novels to write, works of art to complete, diseases to cure, hunger to eliminate, and justice to attain. We need new generations of people who care about and for each other and who care about and for our planet. And most of all, instead of a world of hatred and war, we desperately need a world of respect and peace. CPS provides us with tools that will help us dare to imagine that another world is, indeed, possible.

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About the Author

Prof. Dr. Donald J. Treffinger, President of the Center for Creative Learning, Inc., in Sarasota, Florida, is an internationally known researcher, writer, teacher, and presenter in the area of creativity and Creative Problem Solving, as well as in the area of gifted and talented education. He has authored or co-authored more than 60 books and monographs, including *Creative Problem Solving: An Introduction and Creative Approaches to Problem Solving*, and more than 300 articles. Dr. Treffinger has served as a member of the faculty of many colleges and universities, including Purdue University, the University of Kansas, and Buffalo State College. He has been the recipient of the National Association for Gifted Children's *Distinguished Service Award* and the *E. Paul Torrance Creativity Award*. In 2005, Dr. Treffinger received the *Risorgimento Award* from Destination ImagiNation, Inc., and the *International Creativity Award* from the World Council for Gifted and Talented Children. Dr. Treffinger has served as a reviewer for many professional journals, as editor of the *Gifted Child Quarterly* (1980-84) and as Editor-in-Chief of *Parenting for High Potential*, NAGC's quarterly magazine for parents (2000-07).

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