



## Chapter 11

# Problem-Solving Methods to Facilitate Inclusive Education

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Inclusive education practices require people to work together to invent opportunities and solutions that maximize the learning experiences of all children. This chapter presents ways of planning, adapting, and implementing inclusive educational experiences for students of varying abilities. It is a how-to chapter that is based on the assumption that inclusive educational experiences are desirable for children with and without disabilities. As Giangreco and Putnam (1991) pointed out, when people use terms such as *inclusion*, they may mean different things. To assist readers to understand what we mean by *inclusive education* in this chapter, a five-point definition is presented in Table 1.

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Table 1. Basic components of inclusive education

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Inclusive education is in place when each of these five features occurs on an ongoing, daily basis.

1. *Heterogeneous Grouping* All students are educated *together* in groups where the number of those with and without disabilities approximates the *natural proportion*. The premise is that “students develop most when in the physical, social, emotional, and intellectual presence of nonhandicapped persons in reasonable approximations to the natural proportions” (Brown et al., 1983, p. 17). Thus, in a class of 25 students, perhaps there is one student with significant disabilities, a couple of others with less significant disabilities, and many students without identified disabilities working at various levels.
  2. *A Sense of Belonging to a Group* All students are considered members of the class rather than visitors, guests, or outsiders. Within these groups, students who have disabilities are welcomed, as are students without disabilities.
  3. *Shared Activities with Individualized Outcomes* Students share educational experiences (e.g., lessons, labs, field studies, group learning) at the same time (Schnorr, 1990). Even though students are involved in the same activities, their learning objectives are individualized and, therefore, may be different. Students may have different objectives in the same curriculum area (e.g., language arts) during a shared activity. This is referred to as *multilevel instruction* (Campbell, Campbell, Collicott, Perner, & Stone, 1988; Collicott, 1991; Giangreco & Meyer, 1988; Giangreco & Putnam, 1991). Within a shared activity, a student also may have individualized objectives from a curriculum area (e.g., social skills) other than that on which other students are focused (e.g., science). This practice is referred to as *curriculum overlapping* (Giangreco & Meyer, 1988; Giangreco & Putnam, 1991).
  4. *Use of Environments Frequented by Persons without Disabilities* Shared educational experiences take place in environments predominantly frequented by people without disabilities (e.g., general education classroom, community worksites).
  5. *A Balanced Educational Experience* Inclusive education seeks an individualized balance between the academic/functional and social/personal aspects of schooling (Giangreco, 1992). For example, teachers in inclusion-oriented schools would be as concerned about students’ self-image and social network as they would be about developing literacy competencies or learning vocational skills.
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Inclusive education is in place only when all five features occur on an ongoing, daily basis.

An inclusive school, therefore, is “a place where everyone belongs, is accepted, supports, and is supported by his or her peers and other members of the school community in the course of having his or her educational needs met” (Stainback & Stainback, 1990, p. 3). It is designed to benefit everyone—students with varying characteristics (including those with disabilities) as well as teachers and other school personnel. Readers who are interested in the philosophical rationale for inclusive education are referred to the wide variety of resources available (e.g., Bauer & Shea, 1999; Hunt & Goetz, 1997; Lipsky & Gartner, 1997; McGregor & Vogelsberg, 1998; Stainback & Stainback, 1996; Villa & Thousand, 1995).

The remainder of this chapter is divided into six sections. The first section presents contextual information regarding the challenges associated with educating a diverse group of students in general education environments and activities. The second describes characteristics of effective problem solvers as well as the Osborn–Parnes Creative Problem-Solving (CPS) process. The third section delineates three variations of the CPS process that utilize the creative powers of children and adults to generate options for the inclusion of classmates with diverse needs. The fourth section offers suggestions for evaluating the impact of CPS strategies on the educational experiences of students, and the fifth section discusses implications of using CPS in education.

### **CHALLENGE OF EDUCATING DIVERSE GROUPS IN HETEROGENEOUS GENERAL EDUCATION ENVIRONMENTS AND ACTIVITIES**

We can, whenever and wherever we choose, successfully teach all children whose schooling is of interest to us. We already know more than we need in order to do this. Whether we do it must finally depend on how we feel about the fact that we haven't done it so far. (Edmonds, 1979, p. 29)

Edmonds's (1979) comment reflects a vision of U.S. education that remains unfulfilled and acknowledges the challenges that schools face in realizing this vision. Table 2 contrasts major distinctions between traditional approaches of coping with students' diversity and more contemporary, inclusion-oriented approaches. These distinctions are presented in order to set a context—to highlight the assumptions and approaches that enable educators to meet the challenge of educating diverse groups of students in heterogeneous general education environments and activities more effectively.

It should be noted that even if educators embrace the inclusion-oriented educational tenets presented in Table 2, they still should and do have legitimate questions about *how* educational alternatives work and what the impact of these practices will be. Their questions include the following:

- How can I, as a teacher, accommodate such a wide array of student needs without sacrificing quality?
- Is it not a lot of pressure on one person—the teacher—to generate all of the accommodations that need to be made?
- How will the inclusion of students with diverse needs affect the

Table 2. Approaches to educating students with diverse characteristics

Traditional approaches	Inclusion-oriented alternatives
The teacher is the instructional leader. Students learn from teachers, and teachers solve the problems.	Collaborative teams share leadership. Students and teachers learn from each other and solve problems together.
Students are purposely grouped by similar ability.	Students are purposely grouped by differing abilities.
Instruction is geared toward middle-achieving students.	Instruction is geared to match students at all levels of achievement.
Grade-level placement is considered synonymous with curricular content.	Grade-level placement and individual curricular content are independent of each other.
Instruction is often passive, competitive, didactic, and/or teacher-directed.	Instruction is active, creative, and collaborative among members of the classroom community.
People who provide instructional supports are located, or come <i>primarily</i> from, sources external to the classroom.	People who provide instructional supports are located, or come <i>primarily</i> from, sources internal to the classroom.
Some students do not “fit” in general education classes.	All students “fit” in general education classes.
Students who do not “fit in” are excluded from general classes and/or activities.	All students are included in general class activities.
The classroom teacher and general education team assume ownership for the education of general education students, and special education staff assume ownership for the education of students with special needs.	The classroom teacher and general education team (including special educators, related services staff, and families) assume ownership for educating all students attending the school.
Students are evaluated by common standards.	Students are evaluated by individually appropriate standards.
Students’ success is achieved by meeting common standards.	The system of education is considered successful when it strives to meet each student’s needs.

social and academic outcomes of the other students?

- How will the inclusion of students with diverse needs affect my capacity to provide a quality education to all of my students?

Research in North American schools has yielded sufficient evidence to convince us that the answers to these questions are positive, although much remains to be done. Specifically, our conclusions include the following:

- Diverse student *needs can be accommodated* within general class activities while a high-quality education is maintained for all students.
- The responsibility for developing accommodations can and should be *shared* among many members of the classroom community, including not only the adults within the school but also the students.
- Well-planned inclusion can have *positive* social and academic outcomes for students with and without disabilities.
- Teachers who choose to meet the challenge of educating diverse groups of students *improve* their teaching for the entire class (Hunt & Goetz, 1997; McGregor & Vogelsberg, 1998).

### **OSBORN–PARNES CREATIVE PROBLEM SOLVING AS A METHOD FOR INCLUDING STUDENTS WITH DIVERSE NEEDS IN THE CLASSROOM**

The CPS process (Parnes, 1985, 1988, 1992, 1997) is one method for empowering teams of teachers and students to work together to meet the challenges of educating a heterogeneous school population. CPS is a generic strategy designed for addressing a variety of challenges and opportunities. The process was articulated first in 1953 by Osborn (1953/1993), the person who coined the term *brainstorming*. CPS was further developed by Osborn's protégé and colleague, Parnes, who promoted the use of CPS in many fields—advertising, product development, business, and education. Clearly, creativity is recognized as a valuable process and outcome in education and a necessary skill for professionals who must restructure schools to meet the changing needs of society. Within education, CPS historically was associated with the education of children labeled as gifted. Only since the late 1980s has CPS been applied to inclusion-oriented education issues. As a consequence, in the late 1990s people increasingly began recognizing that approaches to teaching students at opposite ends of the academic achievement continuum hold benefits for the multitude of children in between. What follows are some basic tenets of the Osborn–Parnes CPS process represented as characteristics of effective problem solvers.

#### **Characteristics of Problem Solvers**

To be optimally successful in using the CPS process, participants must exhibit certain behaviors and dispositions identified as characteristic of effective problem solvers. Six of these characteristics are described in this section:

1. Problem solvers believe everyone is creative and has the capacity to solve problems.
2. Problem solvers are optimistic.
3. Problem solvers alternate between divergent and convergent thinking.
4. Problem solvers actively defer and engage their judgment.
5. Problem solvers encourage “freewheeling” and fun.
6. Problem solvers take action.

***Problem Solvers Believe Everyone Is Creative and Has the Capacity to Solve Problems*** Everyone has heard statements such as “I’m not creative” or “I could never come up with those kinds of ideas.” Many people limit the many useful ideas that they are capable of generating by minimizing their personal creative potential. The fact is that people use their creative problem-solving abilities constantly in daily life without even noticing it. Creative abilities are being used every time a person rearranges the furniture, makes a substitution in a recipe, improvises by using an object in place of an absent tool, adapts a game to play with a child, or plans a schedule.

In education, as in many other fields, people have been encouraged to believe that certain experts hold the key to special knowledge or creative solutions. As a result, there is a tendency to become unnecessarily dependent on outside consultants to solve problems while becoming increasingly less confident in one’s own abilities in deference to others’. In contrast, this chapter’s authors believe any group of people has the ability to solve the many challenges of inclusion-oriented schooling through the use of CPS. By working together, teams of people can identify solutions and take actions that no individual could accomplish alone. The practice of using CPS strategies within teams can enhance individual team members’ personal growth and creative capacity in a broad range of situations.

The steps of CPS take advantage of the abilities that people already have and encourage people to emphasize and deliberately use their existing abilities to solve problems. Learning the basics of CPS is easy. People already know how to do most or all of what is needed, and they have been doing it naturally for all of their lives. The new learning comes in practicing the use of these existing skills in new and deliberate ways.

***Problem Solvers Are Optimistic*** CPS, or any other problem-solving method, is based on optimism. Problem solvers enter the process with the knowledge that every challenge they face *can* be

solved, usually in more than one way.

**Problem Solvers Alternate Between Divergent and Convergent Thinking** A central concept embedded in the Osborn–Parnes CPS process is that of actively alternating between divergent and convergent thinking. This means that at each stage of the CPS process, there is a time to consider the challenge in broad, divergent ways and to be open to many possibilities. Then, within the same stage, the problem solver is encouraged to think convergently—to narrow the focus and make a choice from among the many possibilities, allowing the process to continue.

**Problem Solvers Actively Defer and Engage Their Judgment** People frequently inhibit their creative abilities by prematurely engaging their judgment; in essence, they are generating ideas and attempting to evaluate them at the same time. Firestien (1989) likened this to driving a car with your feet on the brake and the gas pedal at the same time. Firestien’s analogy points out that such an approach is unlikely to get anyone far. Effective problem solvers refrain from this practice and identify times to actively defer judgment and times to engage judgment purposefully. These times correspond with divergent and convergent thinking. In a divergent phase, judgment is actively deferred. In a convergent phase, judgment is purposefully engaged.

**Problem Solvers Encourage Freewheeling and Fun** Having fun and being playful with ideas is crucial to effective problem solving. We might think of humor and playfulness as the oil that keeps the creativity engine lubricated and running smoothly. Creative insights as well as humor can be facilitated by bringing together elements that seem incongruent. Gary Larson’s *The Far Side* cartoons are prime examples of incongruity that are both creative and humorous.

Sometimes it may be difficult for people to be playful when the challenges they face are serious; yet, playfulness is essential. During training workshops, we have observed teachers practicing the use of CPS in noneducation situations and doing an excellent job of being playful and having fun with their ideas. When the same teachers were asked to apply CPS skills to educational challenges, however, many reverted to old “school meeting behaviors” that were anything but fun and seriously interfered with their capacity to problem solve creatively. It is easy for people to fall back into familiar patterns and traditional group interactions. Therefore, when using CPS, it is critical to be mindful of this hazard and guard against it with collective playfulness. If people do not enjoy using CPS strategies, they are less likely to use them in the future.

**Problem Solvers Take Action** Problem solvers extend the power of their optimism by acting on their ideas. Ideas that are generated do not have to be earth shattering or world changing. Some people do not use the ideas that they generate because they judge their ideas not good enough. Yet, as Osborn observed, “A fair idea put to use is better than a good idea kept on the polishing wheel” (cited in Parnes, 1988, p. 37). As people start to use CPS and get into new habits that accentuate their creative problem-solving abilities, they find themselves generating more and better ideas. The key is to act, not to wait for the perfect solution before taking action. Better ideas always may be implemented later if and when they are discovered.

## **STAGES OF THE OSBORN–PARNES CREATIVE PROBLEM-SOLVING PROCESS**

The information regarding the six stages of the Osborn–Parnes CPS process presented in Table 3 and described on the following pages is based on descriptions of the process outlined by Osborn (1953/1993) and Parnes (1985, 1988, 1992, 1997) and insights gained from the authors’ use of the process (Giangreco, 1993).

Developing creativity capabilities is a lifelong undertaking (Parnes, 1985, 1988) that should be thought of more as the development of a *creative attitude* than as the learning and application of specific steps and procedures. Thus, the Osborn–Parnes CPS process should be used as a springboard for inventing or personalizing CPS models and techniques. Some of the variations that we have developed to help with the challenges of school and community inclusion are highlighted in the next section. Cycling and recycling through the CPS process and its variations internalize the creative attitude and make creative problem solving a part of one’s daily routine rather than an isolated tool used only in certain contexts (e.g., school versus home or family) or with certain problems (e.g., student versus systems change issues in education reform).

**Stage 1: Visionizing or Objective-Finding** Have you driven down the same road many times and later realized that there was something on that road you had not noticed before? The first stage of CPS helps one become increasingly aware of challenges and opportunities by *sharpening the powers of observation*. It prepares people to use all of their senses and perceptions to explore new possibilities and search for opportunities. The following rules or dispositions will help a problem solver at this stage:

- Think of objective-finding as a starting point or a general challenge.
- Think *divergently* by considering a variety of potential problems to



Table 3. Stages of the Osborn–Parnes Creative Problem-Solving process

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*Stage 1: Visionizing or Objective-Finding* At this initial stage, the problem solvers heighten their awareness through imagining potential challenges. First, they are divergent, considering a variety of possible challenges. Then, they converge by selecting one to begin solving.

*Stage 2: Fact-Finding* Problem solvers gather as much information as possible about the selected challenge by using all of their perceptions and senses. By asking “who, what, where, when, why, and how” questions, problem solvers are divergent in considering multiple perspectives regarding the challenge. They finish this stage by identifying facts they believe to be most relevant to the challenge.

*Stage 3: Problem-Finding* The purpose of this stage is to clarify the challenge or problem by redefining it in new and different ways; by rephrasing the challenge as a question, “In what ways might I/we . . . ?”; and by asking the question “Why?” or “What do I/we really want to accomplish?” This process is repeated until the problem solvers restate the problem in a way that makes the most sense and is most appealing to them.

*Stage 4: Idea-Finding* At this stage, the objective is to defer judgment while generating as many ideas as possible to potentially solve the challenge. Playfulness and wild ideas are encouraged. To come up with ideas beyond the obvious, problem solvers attempt to make new connections between ideas through analogies, manipulation of ideas (e.g., magnifying, minifying, reversing, eliminating), and hitchhiking (i.e., making new associations by building on someone else’s idea).

*Stage 5: Solution-Finding* At this stage of the process, a variety of criteria are considered and ultimately selected for evaluating the merit of ideas. Problem solvers use the criteria to assist in selecting the best solution.

*Stage 6: Acceptance-Finding* The problem solvers refine the solutions to make them more workable. The objective is to turn ideas into action through the development and implementation of an action plan. Regular evaluation of the solution helps problem solvers discover new challenges and ways of addressing them as the action plan is carried out.

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Based on Osborn (1953/1993) and Parnes (1985, 1988, 1992).

solve. Remember to *defer judgment* and have fun.

- Expand possibilities and free yourself from real or perceived boundaries by imagining, wishing, dreaming, and fantasizing.
- Think *convergently* by focusing on one challenge that you really want to solve.
- Remember that challenges come in different sizes. Pick one that is small enough to be solved in the time available. By starting with manageable challenges, teams and individuals are more likely to experience success, develop a creative attitude, and practice and improve their creativity skills.

**Stage 2: Fact-Finding** The purpose of fact-finding is to identify and list as many facts about the challenge as team members

can think of. There is an important relationship between facts and potential solutions. From obvious facts come obvious ideas; from less obvious facts come less obvious and possibly more inventive solutions. To start fact finding, set a relatively short time limit, such as 5–8 minutes. Fact-finding is a quick-paced, rapid-fire listing of what people believe to be true about the challenge situation. The facts should be presented briefly and *without* explanation, judgment, or discussion. In other words, use the approach of the fictional Joe Friday (the character from the famed television series *Dragnet* [Webb, 1952–1959/1967–1971]) and solicit “just the facts, ma’am, just the facts.” Always record and save the list of facts for use later during the CPS process (e.g., during idea-finding). The following are tips for increasing the likelihood that all of the relevant facts emerge:

- Use all of your senses and perceptions to describe what you know about the challenge. Remember, facts can be feelings, so they may be listed also.
- Ask who, what, where, when, why, and how questions about what is and is not true of the challenge situation.
- Think divergently and defer judgment to generate a large quantity and variety of facts. If someone states an opinion with which you do not agree, do not dispute it; rather, accept it as that person’s opinion (e.g., “Larry believes that students act out because they simply are bored during class”).
- Stretch beyond the obvious facts.
- Ask yourself, “What does the challenge or the facts about the challenge remind me of?”
- Think convergently by selecting a subset of relevant facts to assist during problem finding in the next stage.
- Record and save the list of facts. These will be used again later in the process, especially during idea-finding.

**Stage 3: Problem-Finding** Sometimes the initial selection of a challenge is right on target; at other times, the initial selection is just a starting point. The purpose of problem-finding is to clarify the challenge or the problem by considering different ways of viewing it. When rephrasing the challenge at this stage, it is helpful to state the challenge in positive terms by using the starter phrase, “In what ways might we . . . ?” and repeating the question until the team feels comfortable that it has teased out the real issues.

Next, be convergent and select one of the new challenge statements that the team agrees it wants to solve. Consensus may be prompted by asking team members a question such as, "Which of these challenges do we most desperately want to accomplish or solve?" Problem-finding is an important stage of CPS because, as John Dewey observed, "A problem well defined is half solved" (cited in Parnes, 1988, p. 72).

**Stage 4: Idea-Finding** Ideas are potential solutions to the challenge statement selected at Stage 3. Where do these ideas come from? Central to idea-finding is *brainstorming* (Osborn, 1953/1993). Brainstorming is a divergent idea-generating process in which judgment or even praise is deferred in order to help problem solvers stretch beyond the obvious. Quantity is the key, because it is likely that the first ideas generated will be the same old ideas. It is important to keep the ideas flowing as quickly as possible and to limit sessions to 5–10 minutes. Good brainstorming sessions do not look anything like a typical group meeting; in brainstorming sessions, there is little quiet time and people speak in single words or short phrases rather than in sentences. Other important techniques to jar ideas loose are *forced relationships* (Parnes, 1988, p. 158), *synectics*, and *incubation*. These techniques are described briefly in the paragraphs that follow.

*Forced relationships* are achieved when two objects, ideas, or concepts that appear to have little or no relationship to each other are combined or rearranged in some way to generate a new idea to solve a problem. These new connections between apparently unlike entities are made by looking for similarities, analogies, metaphors, or other comparisons between characteristics of the two objects or ideas.

With regard to *synectics*, Gordon and Poze (1979) explained that learning occurs when people *make the strange familiar*. Creativity and invention, however, are facilitated when people *make the familiar strange*. Among the ways of making the familiar strange is to search for new ways of seeing the challenge and facts by *identifying new relationships* through paradoxes, analogies, metaphors, associations, and connections. (For more information, see Gordon [1987] and Gordon and Poze [1979].)

*Incubation* involves moving away from the challenge for a time to engage in different activities and returning to the challenge later.

As mentioned earlier, ideas also may emanate from facts. Thus, it is important to use facts from Stage 2 in conjunction with *idea joggers* by combining or manipulating facts or their dimensions. Idea joggers include questions such as, What would the situation look like if some-

thing (e.g., a fact about the situation) were 1) minified/made smaller, 2) magnified/made bigger, 3) rearranged, 4) eliminated, 5) reversed, or 6) turned upside down or inside out?

Idea joggers may involve *manipulating* dimensions of a fact; for example, if part of a problem situation is *visual* (e.g., In what ways might the school building or the classroom be improved in appearance?), applying idea joggers to visual dimensions such as color, shade, brightness, design, or contrast can generate ideas. Although facts can lead directly to ideas, theoretically the more idea joggers applied and combined, the more ideas that are likely to be generated.

Some ideas that are generated may be wild and unusable. These ideas have tremendous potential value, however, because other ideas may be spurred by them in a *hitchhiking* effect. For example, a class of first graders was presented with the forced relationship of a magazine photograph of a tropical beach scene and the challenge, "In what ways might we help our new classmate, Amy, feel welcome?" One student enthusiastically blurted out, "Let's take her to Bermuda!" The next student said, "I could play with her in the sandbox during recess." This student apparently hitchhiked on the previous idea by identifying similarities between the beach in Bermuda and facts she knew about the schoolyard (e.g., both have sand used for play) (Giangreco, 1993). Idea-finding concludes by focusing on promising ideas.

**Stage 5: Solution-Finding** Solution-finding involves evaluating and selecting from the ideas generated in Stage 4. It begins divergently, with an individual or group considering a wide variety of potential criteria that might be used to evaluate the ideas. For example, ideas about potential accommodations for an individual student might be judged by the following criteria, framed as questions:

1. Is the accommodation feasible?
2. Is the accommodation time efficient for the teacher?
3. Does the student like the idea?
4. Will the accommodation likely enhance the image of the student among peers?
5. Is it consistent with the team's philosophical orientation or shared values?
6. Will the accommodation promote independence and responsibility rather than dependence and helplessness?

Next, the individual or team needs to converge on a subset of criteria and use them to evaluate the ideas. Selecting solutions can be facilitated by cross-referencing ideas and criteria arranged in a matrix. Ideas are listed along the side, and criteria are listed across the top. The matrix offers space to rate each idea based on each criterion. Rating may be as simple as a plus versus minus scoring system or as complex as a scale that weighs criteria differently. Remember, whichever scoring method is used, it is *not* intended to be a formula that removes decision-making power. Rather, the criteria and rating method are intended to provide a rational framework for considering the merits of each idea. Fundamentally, solution-finding is a convergent stage of the CPS process in which judgment is engaged to select or combine ideas for which a plan of action is then devised and implemented.

**Stage 6: Acceptance-Finding** In acceptance-finding, the problem-solving task is to first think divergently by asking and answering who, what, where, when, why, and how questions in order to explore a variety of ways to make the selected solution(s) more workable and effective. The team then acts convergently, developing a step-by-step plan of action. The entire process ends with the problem solvers taking action and regularly evaluating the effectiveness of the selected solution(s). New challenges that arise during implementation may be viewed as *opportunities*—opportunities to cycle through the CPS process again, to invent yet more new solutions, to continue to develop a creative attitude and disposition, and to hone creativity skills.

## **VARIATIONS OF THE OSBORN–PARNES CREATIVE PROBLEM-SOLVING PROCESS THAT TAP STUDENTS’ NATURAL CREATIVI- TY**

This section describes three variations of the CPS process that have been field tested in some Vermont classrooms. The variations are dedicated specifically to developing ways of enhancing meaningful participation for class members when the group includes students with a wide range of abilities and characteristics. The variations focus on the challenge of including an individual student. Although this approach was successful as a starting point, users of the variations are encouraged to consider the challenge as the meaningful inclusion of all class members in the classroom community.

The variations described in this section tap the innate creative abilities of students. Although it may be preferable to teach children a com-

plete problem-solving process (e.g., Eberle & Stanish, 1985), less complete variations have proved to be effective for on-the-fly classroom use. CPS variations work so well because people are by their nature creative; the variations simply “fill in the blanks” for steps missing from the creative processes each teacher develops on his or her own. It should be emphasized that CPS and its variations are generic tools for students to use to address—individually or in groups—a range of academic, social, or personal challenges other than those described in this chapter.

### **Heterogeneous Grouping and Inclusion-Oriented Education: A Prime Opportunity to Engage Creative Processes**

Before detailing each of the three CPS variations, we would like to return to an examination of the context in which the variations are useful. We all know educators who look at students who have widely differing educational needs and use that observation to justify ability grouping within a classroom or the exclusion of some students from typical classes rather than determine in which ways students’ uniqueness can be appreciated and supported. For problem solvers with an inclusive education orientation, placement in the classroom of students with widely differing educational needs is a naturally occurring incongruity or “forced relationship.” Therefore, heterogeneous, inclusive classrooms offer a prime opportunity for many creative ideas and solutions to be developed and tried. Inclusive education and creative problem solving therefore are positively interdependent characteristics of effective schooling.

CPS and its variations work best if a *creative attitude, atmosphere, and culture* exist within the classroom and school community. An additional issue, therefore, in using CPS with and for children in schools is how to promote a culture of creativity so that students eventually identify and engage in creative problem-solving strategies even when they are not asked to do so. The following are some strategies that classroom teachers and administrators have used to establish more creative school cultures:

- Establish and use a collaborative team approach in which members of the classroom and school community work together toward common goals (Thousand & Villa, 1992)
- Be sure that adults model collaborative, open, creative, and problem-solving behaviors (e.g., deferring judgment) for students
- Involve students in making important instructional decisions
- Give students ongoing opportunities to solve important problems in an atmosphere in which their ideas are welcomed and acted on
- Create opportunities for students to see that there can be more than one

right answer to any problem or question

Create ongoing opportunities for learning to be active and fun

As adults, be ready, willing, and able to learn from students as well as from each other

### **Issues in Peer-Supported Problem Solving**

Because the problem-solving strategies described in this chapter engage children in problem solving for a peer, concerns arise with regard to whether having classmates focus on a particular student unnecessarily draws negative attention to the student or otherwise infringes on the privacy and rights of that individual. Such concerns should always be considered seriously. Peer-supported problem solving can be a powerful and effective strategy if precautions designed to protect students' rights and dignity are observed. Specifically, educators should be sure to

Obtain *parental consent* and permission

Obtain *student consent* (Discuss in private the possibility of peer-supported problem solving with the student who will be the focus of discussion and seek feedback and approval before proceeding. For students with communication challenges, explore various observational strategies and augmentative approaches to determine their interest in involving peers in planning processes.)

Respect students' *privacy and confidentiality* needs (For some students, the type of personal information that may be revealed and used in problem solving with classmates may be nonthreatening; for other students, the same information may be considered extremely sensitive and private.)

Use CPS variations respectfully with *other* class members, regardless of whether they have a disability. This establishes the process as a *general* classroom tool for addressing daily challenges and building class community.

### **CPS Variation 1:**

#### **“One-Minute Idea-Finding,” or “Ask the Kids”**

The simplest and quickest variation used in inclusive classrooms is to have the teacher ask the students for their ideas, using the steps presented in Table 4. It is remarkable how many excellent ideas students generate when they simply are presented with information, a challenge, and a request for their ideas.

Table 4. Steps in the “One-Minute Idea-Finding” or “Ask the Kids” strategy

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Step 1.	<i>The teacher presents introductory lesson content or activity directions to the class. This provides the students with some information about the challenge (i.e., fact-finding). They already know other general information about themselves and the classroom.</i>
Step 2.	<i>The teacher presents a selected challenge to the class. For example, a teacher might say, “We are going to be conducting a science experiment in small groups. In what ways can we make sure Molly (a student with educational challenges) is included in the activity?” This step combines objective-finding (CPS Stage 1) and problem-finding (Stage 3). An alternative phrasing that might be more inclusive and respectful would be to ask, “We are going to be conducting a science experiment in small groups. In what ways can we make sure that everyone in each group is included in the activity?”</i>
Step 3.	<i>The teacher asks the students to offer their suggestions for 1 minute in an atmosphere of deferred judgment. This is the idea-finding stage of the CPS process. The ideas may be recorded on the chalkboard or elsewhere.</i>
Step 4.	<i>The class selects from the ideas generated the ones they wish to use. This is the solution-finding stage of CPS.</i>
Step 5.	<i>The students participate in the class activity and use their ideas. This last step represents the acceptance-finding stage of CPS.</i>

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To illustrate the “Ask the Kids” variation, consider the experience of a class of third graders who are preparing a mural as a culminating activity of their social studies unit on cities:

The teacher divided the class into four heterogeneous groups of five students each. One group included Betty, a girl with intensive educational needs. The teacher assigned each group a part of the city to paint or draw (e.g., downtown business area, residential neighborhoods, waterfront, industrial sites). Using cooperative group skills (Johnson, Johnson, & Holubec, 1993) that the class had practiced throughout the year, each group was asked to reach consensus about what would be included in their part and decide who would be responsible for each part. Each group also had to coordinate with every other group so that, when finished, the four pieces could be joined to make a single large mural of a city to be displayed in the hallway. The teacher told the students that they should be prepared to explain what they did within and between groups and why.

The teacher then asked the class, “How can we make sure that Betty has ways to participate in this activity?” Mark said, “She’s up there in her wheelchair, and we’re here on the floor with this big paper. We could get her out of her chair and bring her down here with us.” Karen suggested, “It’s good for Betty to have her arms moved, and I know blue is her favorite color. I could help her hold and move the paint brush to paint the sky and water.” Janet thought, “Betty could help carry our group’s list of ideas to the other group so we can see how our parts will fit together.” “Hey! That makes me think—maybe we could have Betty run the tape recorder so we can tape our list rather than writing it!” said Joe. (Giangreco, 1993, p. 122)



Table 5. Fact-finding backup procedure to Step 3 of “One-Minute Idea-Finding”

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Step 3: The teacher asks the students to offer their suggestions for 1 minute in an atmosphere of deferred judgment (idea-finding). The ideas may be recorded on the chalkboard or elsewhere.

Fact-Finding Backup Procedures

- 3a. If students do not answer, offer a very limited number of ideas or offer standard ideas—the teacher stops and has the students list facts about the activity and class.
  - 3b. The teacher encourages the students to search for ideas that may be spurred by looking at the facts.
  - 3c. If an insufficient number of ideas are generated by looking at direct relationships between the facts and ideas, idea-joggers can be applied to the facts to generate additional ideas.
- 

The key is to *ask* students for *their* ideas. So often we do not do so. This CPS variation is quick, easy, and effective but is limited for two reasons. First, students may come up short on ideas or, after using this strategy repeatedly, give “standard” answers rather than develop new, creative alternatives. Second, although student ideas may lead to meaningful inclusion of the classmate with disabilities, their suggestions may or may not address the individualized learning needs of the student. This represents a common problem in inclusion-oriented classrooms. A student may be welcomed and included, but individual learning objectives may not be adequately or deliberately addressed through participation in class activities. Despite its limitations, this simple variation is consistent with the notion of developing natural supports internal to a classroom and simultaneously facilitating inclusion and a culture of creativity.

**CPS Variation 2:  
“One-Minute Idea-Finding with a Fact-Finding Backup”**

The “One-Minute Idea-Finding with Fact-Finding Backup” variation addresses the problem of students’ getting stuck for ideas or giving standard solutions. The variation takes advantage of the relationship between facts and ideas. As previously noted, ideas can come directly from facts or “idea joggers” used to consider facts from new perspectives.

The steps of this variation parallel those of the first “One-Minute Idea-Finding” variation (see Table 4). The backup process occurs at Step 3, as outlined in Table 5. Using the previous example about Betty’s participation in the social studies mural activity, Giangreco offered the following example of how a teacher might assist students to break through to new ideas:

The teacher could say, “Okay, what do we know about this activity?” As the students use their powers of observation to fact-find, ideas might be spurred. The teacher could continue to facilitate idea-finding by asking probing, idea-jogging questions, such as, “What would happen if we took that fact and reversed it, cut it in half, or made it bigger?” Perhaps the teacher then would present an object as a *forced relationship* to stimulate the students to look for similarities, connections, analogies, or metaphors between the object and the challenge that might help solve the problem. Using these procedures, Andrea realized, “We need to get paper and paints from the supply room [fact-finding]; Betty could go to the supply room with us and help carry back the stuff we need and give it to the other kids” [idea-finding]. Marc added, “We’ll be painting with a lot of different colors [fact-finding]. Hey, maybe Betty could use her switch to turn on a fan. Then the paint would dry faster and we could do more painting” [idea-finding]. (1993, p. 123)

This variation is quick and addresses the issue of what to do if students get stuck for ideas. It does not, however, address the problem of inclusion-oriented classrooms mentioned previously—that is, a student being welcomed and included but individual learning objectives not being adequately or deliberately addressed.

### **CPS Variation 3:**

#### **“Get Some Help from SAM—A Good Friend”**

The third variation was once called the “short-focused option” (Giangreco, 1993, p. 123) because the variation, being less extensive than the full CPS process, can be completed in a *short* period of time (i.e., less than 10 minutes) while *deliberately focusing on the individualized learning objectives* of a student. The deliberate attention on learning objectives distinguishes this third variation from the two described previously. The short-focused option, however, is not a friendly name; one colleague jokingly suggested renaming the variation “John.” Another hitchhiked, saying, “Why not just a name?” Using the forced relationship technique in combination with metaphors and connections between a person’s name and the short-focused option were explored. The name Sam came to mind because of a good friend named Sam. The short-focused option also could be considered a good friend in helping us to pursue quality, inclusive education. Thus, this variation was fondly renamed SAM. SAM is not an acronym for anything, although it could be (e.g., Short Accommodation Method, Super Adaptation Method, Sane Approach Method, Subversive Accommodation Mishaps, Sequential Adaptation Map, Supersonic Activity Maker, Sure-Fire Analog Miracle, Stimulating Amplification Method).

**When to Call on SAM for Assistance** SAM may be called on prior to a lesson as a preplanning activity by the teacher or by a team (e.g., teacher and classroom assistant together, teacher and

special educator together). When done in advance, the classroom teacher must have an idea of how the lesson or activity will be presented because SAM can assist in adapting the original plans to address a mismatch between the planned lesson and the needs of one or more students.

Certain types of activities (e.g., large-group discussions, small-group tasks, independent work, quizzes, labs) may be a consistent part of a classroom scene. If the activities are recurring formats, with variations in content, facts generated by observations of these activities may be useful in generating adaptation ideas for a *series* of similar situations. This avoids continually having to reinvent the wheel. For example, a series of options may be developed for each time a quiz is given, a lab experiment is planned, or a large-group lesson is implemented.

**Examples: The Double-Edged Sword** Although examples are desirable because they can illustrate a process, they are included here with some hesitation. Any time an example is used, there always is the danger that it will become a standard response. The caution, therefore, is to remember that the examples offered here are not the *only* solutions. They may prompt piggybacking or hitchhiking ideas onto them, but clearly they are not the only usable ideas.

The examples embedded within the following steps are based on the student description presented next. As discussed previously, approaches that focus on the inclusionary challenges of an entire class rather than an individual student may be beneficial. In such instances, knowing the learning objectives for other students is necessary to use the SAM variation effectively.

Molly is 11 years old and attends fifth grade at Mountainview Middle School. Molly lives at home with her mom, dad, and younger brother. She is known for her lovely smile and her pleasant personality and is sought after for friendship by her classmates and the children who live in her neighborhood. Molly is considered stubborn and noncompliant by some people, but those who know her best view her simply as strong-willed. Molly enjoys using headphones to listen to many kinds of music. She likes going on almost any kind of outing with family or friends, especially shopping trips with her parents. Her favorite activities include playing on playground equipment, going swimming, playing with her dog, and sledding in the winter.

Molly seems to enjoy being around other people but does not always react as if she knows others are present. This may be due, in part, to the fact that Molly has some hearing and vision loss. Molly has some physical disabilities as well and no formal mode of communication. Thus, it is difficult to determine her sensory abilities precisely. Although Molly has been labeled as having intellectual delays, those who know her have been unwilling to accept any label that limits expectations of her abilities. As her dad pointed out, "We just can't be sure how much she understands or what her potential is, so let's proceed as if she under-

stands everything!”

Currently, Molly communicates primarily through facial expressions (e.g., smiling, frowning). She makes some sounds that family members understand to represent pleasure or discomfort. Her parents have pointed out that they would expect few other people to understand the meaning of these vocalizations unless their meaning had been explained previously. People communicate with Molly by speaking (to take advantage of her residual hearing), using gestures, and showing her objects and pictures (to accommodate for her visual impairments).

Molly gets from place to place by having others push her wheelchair. Molly has limited use of her arms and needs at least partial assistance with most daily activities. Her favorite foods are tacos, fruit, and pizza; she needs to have these and other foods cut into small pieces and fed to her. Molly, her teacher, the classroom assistant who supports her, classmates, and family members receive the support of an integration specialist (special educator), occupational therapist, physical therapist, speech-language pathologist, and deafblindness specialist.

**Steps in Using SAM** Before getting assistance from SAM, it is important to become familiar enough with the basic principles of CPS (e.g., alternating between divergent and convergent thinking, deferring judgment, using idea joggers) and characteristics of problem solvers previously discussed in this chapter to apply them throughout the SAM process. The steps of SAM presented here parallel the six stages of the generic CPS process.

*Step 1: Identify the Challenge and Develop a Challenge Statement:* SAM starts by identifying a class, activity, or situation in which the needs of a particular student differ significantly from the range of educational needs of other students. For example, Molly, described earlier, attends a fifth-grade science class in which much of the curricular content appears not to match her individual educational needs. Yet, there are many opportunities for Molly’s educational needs to be met through existing class activities if the activities are adapted slightly or if new science activities are invented.

Next, a challenge statement is developed. Figure 1 offers a worksheet format for getting assistance from SAM. As Figure 2 illustrates, with the SAM variation of CPS, objective-finding and problem-finding have been combined into a single challenge statement. The challenge statement, “In what ways might we address the educational needs of [insert student name] in [insert name of class or activity] class or activity?” is applied to the student and the situation to become, for example, “In which ways might we address the educational needs of Molly in science class?”

*Step 2: Identify the Facts About the Student’s Educational Needs and the Class or Activity:* The lefthand column of Figure 1 is used to list facts about the student’s program and educational needs. Student facts

**OBJECTIVE-FINDING AND PROBLEM-FINDING:** In what ways might we address the educational need? (minutes) \_\_\_\_\_ In \_\_\_\_\_ (minutes)

FACT-FINDING		IDEA-FINDING	
Facts about student's needs 1	Facts about class/activity 2	Direct ideas 3	Indirect ideas 4

Figure 1. SAM creative problem-solving worksheet. (Based on Osborn–Parnes Creative Problem-Solving process [Parnes, 1985, 1988, 1992, 1997].)

Figure 1. (continued)

<b>SOLUTION-FINDING</b>	<b>Criteria</b>				
	<b>Addresses student need</b>	<b>Neutral or positive for students without disabilities</b>	<b>Likely to support valued life outcomes</b>	<b>Purchased or usable by users (e.g., teacher)</b>	<b>Other:</b> _____ _____ _____
<b>Potential ideas</b>					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					

**ACCEPTANCE-FINDING**

What needs to be done?

Who is going to do it?

When is it going to be done?

Where will it be done?

How can the ideas be improved?

include a brief description of priority individualized education program (IEP) goals, desired learning outcomes beyond IEP priorities, and the general supports necessary to successfully participate in the educational program. As the lefthand column of Figure 2 shows, the following are Molly's priority learning outcomes:

- Make choices when presented with options.
- Greet others.
- Follow instructions.
- React to people by displaying an observable change in behavior.
- Offer assistance to others.
- Engage in active leisure with others (e.g., play group games).
- Use adapted microswitch to activate battery-operated devices.
- Do a classroom job with peer(s).

This is only a *partial* listing of all of the learning outcomes generated by Molly's support team, which includes her parents.

In the second column of the SAM worksheet (Figures 1 and 2), observations about the class or activity may be listed. These facts should include what the teacher and students actually do (e.g., teacher shows a videotape, class plays an educational game, students draw diagrams, groups of students build a model). To gain accurate information about a class may require one or more members of a student's support team to observe in the classroom. In Molly's situation, it is more crucial to identify what the teacher and students *do* than to identify the curricular content of the general education lesson. Thus, no observed event is insignificant, because any activity may prove to be useful in either prompting or being an idea for adapting a lesson. For example, which adaptations or accommodations for Molly do the facts about science class (see Figure 2) bring to mind?<sup>1</sup>

Before the bell rings, the teacher and students *greet* each other and talk

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<sup>1</sup>The SAM worksheet presented in Figure 1 is meant to offer a format to facilitate systematic exploration of possibilities at each step of the SAM process. The authors acknowledge that the SAM form has limited space and likely will be insufficient for all of the ideas that will be generated. It may be easier, therefore, to simply have the form available as a reminder of the SAM process and to write ideas as lists on blank sheets of paper. SAM users also are encouraged to modify or develop their own SAM worksheet formats and share them with the authors.

**OBJECTIVE-FINDING  
AND PROBLEM-FINDING:**

In what ways might my address the educational needs of Molly in Science (subject) (classroom)?

FACT-FINDING		IDEA-FINDING	
<p>Facile about student's needs</p> <ol style="list-style-type: none"> <li>1. Makes choices</li> <li>2. Grants others</li> <li>3. Follows instructions</li> <li>4. Attempts to please.</li> <li>5. Offers encouragement.</li> <li>6. Engages in positive behavior</li> <li>7. Uses "switch"</li> <li>8. Does classroom job with peer(s)</li> </ol>	<p>Facile about classroomability</p> <p>(classroom ability)</p> <ol style="list-style-type: none"> <li>1. Students great and enter and teacher before class bell rings.</li> <li>2. Student hand in homework to her on teacher's desk.</li> <li>3. Teacher stuff students spend for class.</li> <li>4. Teacher-funs off lights and spaces short video.</li> <li>5. Teacher assigns small groups to play educational games to reinforce video.</li> <li>6. Teacher passes out quiz.</li> <li>7. Some students who finish early read class book and pencils.</li> </ol>	<p>Direct Ideas</p> <p>(specific actions)</p> <p>Teach/practice quietly before bell rings.</p> <p>Start an ethics lesson (game skills) during optional games and instruction following.</p> <p>Bring in class pairs with a peer who is a class room job.</p>	<p>Indirect Ideas</p> <p>(general thinking)</p> <p>Student chooses which game to play.</p> <p>Student gets opportunity to react to decisions by having "homework box" on her desk.</p> <p>Student offers assistance to others and gets opportunities to react by having off games.</p> <p>Student uses switch to activate TV/VCR and listen to music when adapted game is completed.</p>

Figure 2. SAM creative problem-solving worksheets completed for Molly.



Figure 2. (continued)

<b>SOLUTION-FINDING</b> <i>(partial listing)</i> Potential ideas	Criteria				
	Addresses student need	Neutral or positive for students without disabilities	Likely to support valued life outcomes	Perceived as usable by users (e.g., teacher)	Other: _____ _____ _____
① Student chooses game.	+	+	+	+	
② Homework box on desk.	+	+	+	+	
③ Hand out quizzes	+	+	+	+	
1. Switch for lights	+	+	+	-	
2. Switch for TV/VCR	+	+	+	-	
④ Switch for tape player	+	+	+	+	
⑦ Grocking before class	+	+	+	+	
⑧ Cares for class pets	+	+	+	+	
⑨ Plays educational games	+	+	+	+	
10. Grades quizzes with key	+	-	-	-	
11. Record and play tape of class episode	+	+	+	-	
12.					

**ACCEPTANCE-FINDING**

What needs to be done?

Who is going to do it?

When is it going to be done?

Where will it be done?

How can the ideas be improved?

informally.

*Students* hand in their homework by leaving it in a box on the teacher's desk.

*A student turns off the lights* before a film is shown.

The *teacher* passes out the quiz.

Remember, when facing curriculum overlapping challenges, the nature of activity in a classroom is more important to developing adaptations than the actual lesson content is. When classroom approaches are primarily passive and teacher directed, opportunities for meaningful participation for curriculum overlapping are more limited. When classroom approaches are active and participatory, opportunities for meaningful participation expand. A goal of creative problem solving, therefore, is to increase teachers' use of more active and participatory instruction approaches.<sup>2</sup>

*Step 3: Generate Direct and Indirect Ideas:* A first level of idea-finding involves a systematic comparison of each fact about the student (see the first column in Figure 2) with each fact about the class or activity (see the second column in Figure 2) to look for direct, obvious relationships. Any direct ideas that arise through this comparison are recorded in the third column of Figure 2, labeled Direct Ideas. Given 8–10 facts in each of the two fact columns, the comparison process should take no more than a few minutes.

Let us compare the facts about Molly and her class listed in Figure 2. It is immediately apparent that there is a direct relationship between the second fact in Column 1 (i.e., greets others) and the first fact in Column 2 (i.e., students greet each other and the teacher before the bell rings). This class appears to offer a natural time to teach and practice greetings. Notice also that Molly's goal of participating in active leisure with peers relates directly to the teacher's planned activity for students

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<sup>2</sup>Information about the student may come from any of several sources. If using COACH (Giangreco, Cloninger, & Iverson, 1998), this information may come from one of three sources: 1) the Program-at-a-Glance, 2) the Scheduling Matrix, or 3) the student's schedule. A Program-at-a-Glance lists a full set of facts regarding the content of the student's educational program. A Scheduling Matrix provides a set of facts as they relate to particular classes or major class activities. Both identify priority objectives for a student, other anticipated learning outcomes, and general supports the child's team has decided are needed for student participation in classes. SAM has been pilot tested in environments where COACH was used to generate information about the focus student. Of course, information about a student may be generated or collected in many other ways, directly (e.g., direct observation) and indirectly (e.g., record review and interviews with the student, family members, friends, school personnel).

to play educational games. Their activity is a natural opportunity for Molly to follow instruction related to game playing (e.g., rolling dice, picking up cards, moving a marker). Another direct relationship exists between Molly's need for doing a classroom job and the activity of feeding and caring for the classroom fish and gerbils. Clearly, caring for the classroom animals could be a class job done with a classmate.

Systematically comparing facts about a student's needs and classroom routines may reveal that naturally occurring opportunities for meaningful inclusion already exist, without the need for significant changes in routine. The number of such opportunities, however, may be insufficient for an educational experience of adequate quality; therefore, it may be necessary to invent adaptations to existing routines or invent completely new experiences.<sup>3</sup>

After identifying direct ideas, it may be necessary to look for *indirect ideas* by applying idea joggers to facts. Following the same pattern used to find direct ideas, facts about the student and facts about the class or activity are compared while applying an idea jogger (e.g., ask, "What would happen if we eliminated this fact or made it bigger or smaller?"). At this point, it is critical to defer judgment about the quality, usefulness, or feasibility of the ideas that result. For example, suppose the idea jogger of *reversing* were applied to the facts in Figure 2. The teacher intends to assign small groups to play educational games to reinforce content presented in the videotape. By reversing who chooses the game from teacher to student, an idea is generated for Molly to work on choice making, a priority goal for her (see Column 4 of Figure 2).

Suppose the idea jogger of *rearranging* were applied to Molly's goal of reacting to the presence of other people and the fact that, in this science class, students hand in homework by placing it in a box on the teacher's desk. Rearranging the place where homework is turned in so that the homework box is on Molly's desk would create as many opportunities for interaction as there are students in the class.

Combining *rearranging* with the idea jogger of *minifying/making smaller* and applying them to the fact that the science teacher passes out quizzes and Molly needs practice in reacting to and offering assistance to others could lead to the indirect idea of having Molly and a classmate, rather than the teacher, pass out quizzes. To keep the pace of classroom activities typical, the task could be made smaller so that

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<sup>3</sup>Although the two fact-finding and idea-finding steps are presented here in a linear, sequential fashion, we have found shifting attention back and forth between the two sets of facts to be a powerful technique for prompting ideas for adaptations. For example, once educational needs are listed, each new class/activity fact can be compared with the needs to see if an idea is immediately spurred. These ideas should be recorded as they are generated.

Molly hands out 5 quizzes in the same time that her partner hands out 20. Although all of the ideas just described may seem small, they do match the student's identified needs.

*Step 4: Evaluate Ideas and Choose Solutions:* Step 4 involves solution-finding and convergent thinking. In this step, direct and indirect ideas are evaluated based on a set of criteria. The four criteria on the SAM worksheet (see Figures 1 and 2) are offered as starting points for evaluating ideas. Ideas are listed in abbreviated form in the lefthand column of the SAM worksheet (see Figures 1 and 2), then each idea is judged according to the selected criteria. Using the four criteria included on the worksheet, one may ask:

Does this idea address an identified student need?

Is the idea positive or at least neutral in terms of its likely impact on students without disabilities?

Is the idea likely to yield valued life outcomes (e.g., friendships and affiliations; access to meaningful places and activities; choice and control that match a person's age, health, and safety)?

Is the idea perceived as feasible and meaningful by the user (e.g., the teacher)?

As already noted, the process of applying criteria to potential ideas is intended to assist with decision making. Criteria therefore must match the situation and be adjusted, replaced, eliminated, or otherwise changed to match the unique characteristics of a situation. Items may be rated by using whichever method is preferred and makes sense, as long as preferred solutions have been selected by the end of this step.

*Step 5: Refine Ideas to Develop and Carry Out an Action Plan:* Once solutions have been selected, they must be refined. Idea joggers continue to be helpful in accomplishing this end. For example, suppose that a direct idea is generated about playing an educational game as an accommodation for Molly. When looking carefully at the nature of the game, Molly's physical characteristics likely would prompt the question, "What if the game parts were bigger?" This type of simple adaptation might allow Molly to participate, at least partially, with game materials. The "who, what, where, when, why, and how" questions facilitate the development and delivery of a CPS action plan. As ideas are implemented, CPS users must remember to be alert to new facts and new ways to make the familiar strange. Also, it should be noted how repeatedly cycling through the SAM and other CPS variations develops a creative attitude and competence.

**Evaluation of Intervention Impact on Indicator: \_\_\_\_\_ PRE or \_\_\_\_\_ POST**

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Student name \_\_\_\_\_ Grade/Placement \_\_\_\_\_

Lesson/activity \_\_\_\_\_

Lesson/activity time of day \_\_\_\_\_ Length of lesson/activity \_\_\_\_\_

Observation dates: from \_\_\_\_\_ to \_\_\_\_\_ Number of observations \_\_\_\_\_

Teacher(s) of the lesson/activity \_\_\_\_\_

Name of respondent \_\_\_\_\_

Describe the extent of involvement (e.g., how, what) for the student with special needs in the lesson/activity: \_\_\_\_\_

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Average number of minutes of participation: \_\_\_\_\_ min out of a total of \_\_\_\_\_ possible minutes

Average number of opportunities/turns for participation per lesson: \_\_\_\_\_

Compared to classmates, the time and opportunities for participation by this student typically are:

\_\_\_\_\_ significantly less    \_\_\_\_\_ slightly less    \_\_\_\_\_ about the same    \_\_\_\_\_ more

Based on your observations of the lesson/activity prior to \_\_\_\_\_ (the intervention)

1. How involved was the student in the lesson/activity?

Not involved										Very involved
	1	2	3	4	5	6	7	8	9	10
Comments:										

2. How much did the student benefit educationally (based on his/her individual educational program) from participation in the lesson/activity?

Not at all										Very much
	1	2	3	4	5	6	7	8	9	10
Comments:										

3. Did you have a clear idea which of the student's individual goals and objectives could be addressed during this lesson/activity?

Not at all clear										Very clear
	1	2	3	4	5	6	7	8	9	10
Comments:										

4. Did you have enough viable instructional ideas to include the student with special needs in meaningful ways during this lesson/activity?

Insufficient number										More than sufficient number
	1	2	3	4	5	6	7	8	9	10
Comments:										

(continued)

Figure 3. CPS Impact Evaluation. (From Giangreco, M.F. [1993]. Using creative problem-solving methods to include students with severe disabilities in general education classroom activities. *Journal of Educational and Psychological Consultation*, 4, 131-132; reprinted by permission of Lawrence Erlbaum Associates.)

Figure 3. (continued)

5. Did you use an identifiable method to develop ways of including the student with special educational needs in this lesson/activity?
- |                        |   |   |   |   |                             |   |   |   |    |
|------------------------|---|---|---|---|-----------------------------|---|---|---|----|
| No identifiable method |   |   |   |   | Clearly identifiable method |   |   |   |    |
| 1                      | 2 | 3 | 4 | 5 | 6                           | 7 | 8 | 9 | 10 |
| Comments:              |   |   |   |   |                             |   |   |   |    |
6. What impact did the methods used to include the student with special needs (not the presence of the student) in this lesson/activity have on the educational growth (academic/social) of other students?
- |                 |   |   |   |   |   |   |                 |   |    |
|-----------------|---|---|---|---|---|---|-----------------|---|----|
| Negative impact |   |   |   |   |   |   | Positive impact |   |    |
| 1               | 2 | 3 | 4 | 5 | 6 | 7 | 8               | 9 | 10 |
| Comments:       |   |   |   |   |   |   |                 |   |    |
7. How confident are you that the methods used to include the student with special needs in this lesson/activity can be generalized to other lessons in the same content area and/or other content areas to more fully include this student?
- |               |   |   |   |   |   |   |                |   |    |
|---------------|---|---|---|---|---|---|----------------|---|----|
| Not confident |   |   |   |   |   |   | Very confident |   |    |
| 1             | 2 | 3 | 4 | 5 | 6 | 7 | 8              | 9 | 10 |
| Comments:     |   |   |   |   |   |   |                |   |    |
8. To what extent did the methods used to include the student with special needs lead to improved valued life outcomes (VLO) for the student (e.g., affected relationships with others; expanded access to settings and activities; improved health/safety; offered choice or control)?
- |                            |   |   |   |   |   |                            |   |   |    |
|----------------------------|---|---|---|---|---|----------------------------|---|---|----|
| Did not improve VLO at all |   |   |   |   |   | Improved VLO significantly |   |   |    |
| 1                          | 2 | 3 | 4 | 5 | 6 | 7                          | 8 | 9 | 10 |
| Comments:                  |   |   |   |   |   |                            |   |   |    |
9. Overall, how satisfied are you with the current extent and quality of involvement of this student in the lesson/activity?
- |               |   |   |   |   |   |   |                |   |    |
|---------------|---|---|---|---|---|---|----------------|---|----|
| Not satisfied |   |   |   |   |   |   | Very satisfied |   |    |
| 1             | 2 | 3 | 4 | 5 | 6 | 7 | 8              | 9 | 10 |
| Comments:     |   |   |   |   |   |   |                |   |    |

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## EVALUATING THE IMPACT OF USING OSBORN-PARNES CREATIVE PROBLEM-SOLVING PROCESS WITH REGARD TO STUDENTS' EDUCATIONAL EXPERIENCES

For any educational innovation, it is crucial to evaluate the innovation to determine whether it is achieving its intended outcomes. The use of CPS is intended, at a minimum, to 1) increase the frequency and quality of instructional involvement within heterogeneous groups, 2) meet the educational needs of the student with disabilities, 3) meet the educational needs of students without disabilities, and 4) provide support mechanisms and teaching adaptations for the teacher and other members of the classroom community. Measurement techniques, such as frequency counts, time samples, and item-by-item ratings of specific target behaviors, may answer certain evaluation questions. Teachers, however, may find more user-friendly (Meyer & Janney, 1989, p. 263)

forms of measurement useful to augment more-traditional approaches, such as the CPS Impact Evaluation offered in Figure 3.

A teacher may complete the CPS Impact Evaluation form before and after using CPS and its variations in a classroom. Direct observations of a student in the class, combined with the preintervention use of the evaluation, give a quick overview of the situation without interfering with instruction or taking an inordinate amount of time. Once CPS strategies have been applied for a sufficient amount of time, the teacher may again use the CPS Impact Evaluation form as a postintervention measure. Comparison of pre–post responses offers a relatively simple and quick assessment of the perceived impact of the use of CPS.

Clearly, this type of evaluation may not yield reliable responses across team members (e.g., teacher, parents, students, special educator, principal). When team members who have independently completed the evaluation form disagree on pre- or postassessments, the tool serves another function—it prompts team members to engage in a dialogue, which should facilitate a collective understanding of educational programs, a shared framework for adjusting instruction, and improved teamwork.

## **EDUCATIONAL IMPLICATIONS OF USING THE OSBORN–PARNES CREATIVE PROBLEM-SOLVING PROCESS**

Table 6. Implications of using CPS for students with and without disabilities

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CPS engages students in the solution of real-life problems and challenges, which are an essential characteristic of effective education (Dewey, 1938/1998).
CPS encourages students to believe they can solve problems, either independently or with the support of others in the class.
CPS offers students at all levels of academic achievement the opportunity to assist in solving relevant challenges faced by them or their classmates and establishes all students as valued contributors.
CPS offers opportunities for students to be included in general class activities in ways that meet their individualized educational needs.
CPS offers opportunities for students to learn and practice problem-solving skills on an ongoing basis to address relevant challenges.
The collaborative, nonjudgmental, and action-oriented aspects of CPS encourage a sense of community building among classmates when the process is used to address challenges that are of concern to the group.
CPS can encourage and reinforce many desirable academic and affective skills (e.g., observation, analysis, evaluation, perspective taking, building on another's ideas, synthesizing ideas).

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Table 7. Implications for professionals working with students in heterogeneous groups

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CPS encourages teachers to be open to the possibility that there is more than one “right” answer.
CPS encourages teachers to provide the kinds of active, problem-solving learning experiences that educational leaders have advised us are essential now and will be increasingly vital as we enter the 21st century.
CPS encourages teachers to be ongoing learners and especially to open themselves to learn from the children in their classes.
CPS provides a method for distributing the pressures of instructional accommodations in inclusive classrooms across a wider group of problem solvers.
CPS used by teachers can enhance their capacity to teach all children by recognizing existing options for teaching heterogeneous groups, adapting other existing options, and inventing new options.
CPS encourages teachers to design interesting, active approaches to education that account for student input and result in motivating learning experiences.

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This chapter opens with the proposition that inclusive education arrangements are desired alternatives to more exclusionary traditional approaches. The Osborn–Parnes CPS process and its variations are offered as a set of procedures for empowering teams to meet the challenge of meaningfully instructing heterogeneous groups of learners.

There are many implications of mastering and using CPS and its variations, particularly in the education of students who otherwise might be excluded from general education opportunities. Table 6 offers anticipated benefits for students with disabilities and their peers without disabilities; Table 7 suggests positive outcomes that educators should expect when they use the problem-solving methods described in this chapter.

Taking action is the first, middle, and culminating step for any problem solver, including those of us who are interested in excellence, excitement, and equity in education. We would do well, therefore, to follow the advice of Kettering to “keep on going and chances are you will stumble on something, perhaps when you least expect it. I have never heard of anyone stumbling on something sitting down” (cited in Parnes, 1988, p. 89). The CPS strategies offered in this chapter should help us to keep on going, for, as Cheyette noted, “creativity is converting wishful thinking into willful doing” (cited in Parnes, 1988, p. 105).

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