Abstract

This chapter describes how a problem-solving process can be employed effectively in the context of team decision making to design, implement, and evaluate a comprehensive school violence prevention program. Problem solving is conceptualized as the systematic effort to reduce the discrepancy between a current undesirable situation, such as frequent bully behavior, and that of a more preferred circumstance. A five-step process is identified: (a) problem identification, (b) problem analysis, (c) problem response proposals, (d) response implementation, and (e) evaluation of prevention strategies. The model places heavy reliance on data-gathering and analysis at the building level to define the problem accurately, and then to monitor effectively the progress of subsequent prevention programs and procedures.

A Problem-Solving Approach to School Violence Prevention

Virtually all plans to prevent the expression of aggressive or violent behavior in and around any school building arise out of some form of problem-solving process. Because violence is anathema to the educational process, the actuality or even the potential for it creates a problem in the school setting.

A problem is a situation which is experienced by an agent as different from the situation which the agent ideally would like to be in. A problem is solved by a sequence of actions that reduce the difference between the initial situation and the goal.

(Heylighen, 1998)
Simply stated and using Heylighen’s definition, educators will become aware of situations in the school that are different from the way they desire them to be in the course of normal activities. Related to problems of school violence, this may be a new awareness of escalating incidences of bullying, finding a gun in a locker, or as was the case following the Columbine and other high profile school shootings, parental and media calls to hyper-protect children in school. Action will then be taken to reach a goal that reduces the difference between the way things are (e.g., too much bullying, too much parental concern) and the way the educators want them to be.

The elegance of the problem-solving process lies in its heuristic simplicity; the complexity lies in its execution. In this chapter, we examine how educators concerned with violence prevention can proceed most effectively from the first recognition of a need to act to the final goal attainment using a structured problem-solving methodology.

Conceptual Basis

The conceptual origins of problem solving as a process for service delivery in a system such as a school can be traced within modern psychology to theory and research in cognitive psychology, and more specifically, information processing psychology. In their seminal work, *Human Problem Solving*, Newell and Simon (1972) postulated that human beings are information processing organisms who, when presented with a stimulus, engage in a sequence of sensory reception, data transformation, memory integration, and behavioral output. When applied specifically to the process of cognitive problem solving, Newell and Simon theorized that the information must be further organized into a sequence of four tasks:

1. Identification of the problem space, which is the boundary between what is known and what the eventual goal is to be;
2. Identification of the intermediate states or sub-goals that must be attained to reach the final goal state;
3. Identification of the moves or action that must be enacted by the problem solver to move from one goal state to the next;
4. Identification of the resources necessary (e.g., time, knowledge, skills, people) to move from one goal state to the next.

These theoretical constructs have served as the foundation for applied work in clinical social problem solving, including therapy with adults (e.g., D’Zurrilla & Nezu, 1999), understanding aggressive children (e.g., Crick & Dodge, 1994; Dodge, 1986), and social skills training with children (e.g., Spivack, Platt, & Shure, 1976).

Problem solving as a model for service delivery in general and special education has expanded in recent years (Allen & Graden, 2002; Cantor, 2004; Deno, 2002). In the mid-1990s, the Heartland Area Education Agency in Iowa spearheaded a state-wide reformation of special education service delivery that systematized a problem-solving model to address learning and behavioral needs of students (Ikeda et al., 2003; Ikeda, Tilly III, Stumme, Volmer, & Allison, 1996). Subsequently, this model has been adopted by other school districts around the country, including the Milwaukee Public Schools (Haubner, Staum, & Potter, 2002) and the Minneapolis Public Schools (Marston, Cantor, Lau, & Muyskens, 2002). More recently, the emergence of Response to Intervention (RtI) and the three-tiered model of academic and social-emotional service delivery has helped to integrate the problem-solving model into the day-to-day decision-making process of an increasing number of schools (Cantor, 2006; Gresham, 2006).
Problem Solving and School Violence Prevention

In the period after the tragic school shootings between 1997–2000, and in the aftermath of the September 11, 2001, attacks on the World Trade Center and the Pentagon, the professional literature offered numerous organizational structures for educators to use as they approach the issue of school violence prevention (e.g., Dwyer & Jimerson, 2002; Dwyer & Osher, 2000; Dwyer, Osher, & Warger, 1998; Larson, Smith, & Furlong, 2003). More recently, the National Association of School Psychologists has developed an incident command system crisis prevention and response model, PREPaRE, based on the Department of Homeland Security’s National Incident Management System (Brock et al., 2009). Central to each of these structures is the employment of a broadly representative, school-based team to initiate and oversee the effort. When constructing a school safety team, building representation should be secured from among diverse segments of the faculty as well as administration, pupil services, and unclassified staff. At the middle and high school levels, student representatives should be selected. This core team should subsequently identify which community and parent candidates will have the interest, expertise, and time to be a part of the team. A diverse team structure such as this can facilitate (a) topic-focused, data-based decision making; (b) enhanced buy-in and shared responsibility among stakeholders; (c) perspective sharing among stakeholders; and (d) centralized coordination of multiple services and programs. By its nature, problem solving thrives in a framework wherein ideas may be freely exchanged and fully analyzed from multiple perspectives, and a team format offers such a context. Readers should consult Dwyer and Jimerson (2002) and Brock et al. (2009) for comprehensive and practical guides to the design and organization of teams for school safety decision making.

The application of a problem-solving process to school violence prevention has been put forward (Larson, 2008; Larson et al., 2003). These authors identified a five-step process: (a) problem identification, (b) problem analysis, (c) problem response proposals, (d) response implementation, and (e) evaluation of prevention strategies. In the remainder of this chapter, we further articulate and expand this format with a special emphasis on procedures to acquire and analyze local school-based data to assist in decision making at each step. As a vehicle to enhance understanding at a practical level, we frame this discussion in part along the efforts of a hypothetical school safety team working at a school we will call Kennedy Elementary. Kennedy is a K–5 school of 600 students located in an ethnically diverse, major metropolitan area. Forty percent of its students qualify for free or reduced lunch.

**Step 1: Problem Identification**

Effective problem identification involves two essential processes: (a) understanding through assessment and (b) reframing for action. The school safety team must first gather enough reliable information to be able to frame the problems that the school is experiencing in language that lends itself to action plans. To accomplish this goal, the team needs to know the extent and nature of the gap that exists between the current reality and the desired reality. The current reality can be defined as an interaction between the nature and extent of existing violence-related behaviors in the school and the effectiveness of existing programs and procedures to prevent them. The essential questions are:

1. What are the personal experiences of school violence from the perspective of students, staff, and parents? What are the nature, frequency, and other pertinent characteristics of interpersonal aggression in the school?
2. What is the context of school violence (e.g., in the classroom, non-instructional areas, exterior grounds)? In what way does the context increase or decrease the likelihood of aggressive behavior?

3. What has been the impact of current prevention measures? Are there efficacy data on current approaches?

Archival Data

An appropriate starting place is with data already in archival form within school records. Disciplinary office referrals can be a useful index of day-to-day student behaviors that contribute to an unsafe learning environment (Morrison, Peterson, O’Farrell, & Redding, 2004). The team should examine the records for information regarding incident frequency within a defined time period, at a minimum within the most recently completed school year and continuing up to the present date. The team should graph the frequency of behavior problems such as fistfights, bully perpetration (including relational aggression and cyberbullying), gang-related behaviors, “hate crime” behaviors that target specific groups, weapon possession, vandalism, inappropriate sexual conduct, and drug possession. This exercise can also serve as an impetus to improve the incident reporting system if necessary.

Morrison et al. (2004) recommended that a disciplinary reporting system contain the following information: (a) demographic data on the referred student, such as academic status, special education status, ethnicity, and gender; (b) a full description of the nature of the problem behavior; (c) the location of the problem behavior; (d) the identity of the referring person; (e) date and time of the incident, and; (f) the effectiveness of the consequences. Software and Internet support are available to assist schools in collecting, maintaining, and analyzing discipline data. For example, School Safety Software: SSP (GBA Systems; http://www.glbssoft.com/docs/slicks/School%20Safety.pdf) is a sophisticated data collection and analysis program for schools that “meets or exceeds most of the recommendations by the National Forum on Educational Statistics with its ability to collect, report, and analyze incidents of crime and violence at school” (Minogue, Kingery, & Murphy, 1999, p.11). Additionally, the School-Wide Information System (SWIS; http://www.swis.org) is an Internet-based system that allows for secure storage and report generation of disciplinary data to monitor trends and to aid in the development of student interventions.

The team also should gather available data on existing programs and procedures of a preventative nature that function both in the school and in the community through a resource mapping exercise (e.g., Adelman & Taylor, 2006). This examination must differentiate those resources that are genuine and active from those that may be only “paper programs;” that is, those programs that are carried on the books but seldom accessed (Dwyer & Jimerson, 2002).

A comprehensive examination of existing prevention programs can help direct needed resources toward demonstrably effective efforts as well as identify needed improvements for promising programs. In addition, a wide-ranging examination of all of the prevention programs in the schools can provide the necessary documentation to eliminate those programs that fail to demonstrate a positive effect and may be usurping valuable resources that could be reallocated elsewhere.

Needs Assessment Surveys

Personal experience and context data can be most efficiently obtained through carefully considered needs assessment surveys and self-reports. Peterson and Skiba (n.d.a,b) designed a set of assessment tools for use within a school safety team that allow members to self-assess their own
understanding of current prevention procedures in the school, and to organize their thoughts about what their colleagues outside of the committee believe about the problems. These tools are a useful starting point as the team prepares to assemble a wider needs assessment survey; they are available for download at http://www.unl.edu/srs/tools.html. Students also are an essential source of information; their input into the problem definition undertaking can provide the school safety team with substantial clarification and direction. The California School Climate and Safety Survey – Short Form (Furlong et al., 2005) is a 52-item revision of an original 102-item form. The scale yields self-report information from students in three principal areas: School Danger, School Climate, and School Victimization. This measure is available for download at http://web.me.com/michaelfurlong.

Our hypothetical school safety team at Kennedy Elementary School used these assessments methods to gather survey data from all staff members and all students in the fourth and fifth grades. They also examined office disciplinary forms that helped them identify “hot spots” in the school for problem behavior, including fighting. These data also illuminated periods in the week and school year that occasioned the most aggressive behavior and the referral rates of individual teachers. The team now needs to convert the accumulated data into practical information that can be useful for prevention planning.

**Step 2: Problem Analysis and Hypothesis Development**

This phase of the problem-solving process necessitates that the school safety team organize the data in a manner such that converging trends become evident. The main foci of the problem analysis phase are validation of the problem definition(s) and subsequent generation of hypotheses for responding to the problem. Care must be taken to avoid over- or under-interpretation, which can be accomplished by using a systematic process of data analysis. We suggest that the school safety team adopt a gating procedure to validate the problems that are identified through the first gate (i.e., the initial data collection). In the second gate, the problem is validated within a test-retest method. The retest can be accomplished by a second administration of the assessment methods to the initial sample, or randomly selecting a subset of respondents for follow-up validation surveys or interviews. Although a second assessment is time consuming, the gating method allows for more systematic identification of those areas in need of intervention by compensating for temporal or transient variables, and validating perceptions of problems as identified in the initial assessment data. The use of a gating procedure also provides for more focused problem response proposals, thereby offsetting potential wasted time and resources. Once the data are gathered, a simple component or item analysis can be conducted to identify and prioritize problem areas.

With analyzed data in front of them, the team next must convert the data to behaviorally worded action hypotheses. Hypothesis development involves translating what the data indicate into workable propositions about environmental or individual variables that mediate the problem. For example, data that showed high frequencies of lunchroom fights may be hypothesized to be a function of overcrowding, inadequate supervision, poor environmental design of the facility, student anger management deficits, lousy food, or some combination of any or all of these variables. Each action hypothesis should contain implications for intervention that are practical and testable.

A useful method for creating testable action hypotheses is through the use of Goal Attainment Scaling (Kirusek, Smith, & Cardillo, 1994; Roach & Elliott, 2005). Goal Attainment Scaling (GAS) is a criterion-referenced approach to operationalizing problem definitions that also can be used to document intervention effectiveness. The basic methodology can be used at either an individual or group level and involves operationally defining successive levels of program.
progress on a 5-point or 6-point scale, i.e., –2 to +2, wherein a rating of 0 indicates baseline, –2 indicates that a problem is much worse and +2 indicates a program goal is attained. For example, consider the survey item “I have stayed at home to avoid being bullied.” If baseline data indicate that 18% of fourth- and fifth-grade students responded to the item, then 18% is given a GAS rating 0. The school safety team then defines the level of goal attainment necessary for each rating. For example, the team may agree that a decrease to a rate of at least 10% would indicate progress toward the program goal (GAS = 1), a decrease to less than 1% would indicate the program goal was attained (GAS = 2), an increase up to 25% indicates a moderately worse problem (GAS = –1), and an increase to above 25% indicates the problem has significantly worsened. As shown in Table 4.1, the GAS method is simple to use, provides a format for writing testable hypotheses, is readily understandable, and it can be used to gather outcome data on a number of different action hypotheses. Finally, the GAS method reflects the criterion-based nature of data that can be most useful in individual school settings.

The school safety team at Kennedy Elementary found multiple sources of assessment data that converged on three major areas of concern: (a) bullying in the fourth and fifth grades; (b) fighting across all grade levels; and (c) staff desire to re-invigorate the building code of conduct.

**Step 3: Problem Response Proposals**

With the data now organized into focused student, staff, and environmental needs, school safety team members must consider options regarding how the building should address the identified needs. In recent years, a three-tiered public health schema for classifying prevention outcomes has been applied to the schools (Walker, Ramsey, & Gresham, 2004; see also Furlong, Morrison, Austin, Huh-Kim, & Skager, 2001; Larson, 2008). Using this model, prevention planners apply a primary, secondary, and tertiary needs hierarchy to the school population. At the primary level, universal interventions are designed and implemented to prevent the development and occurrences of antisocial, aggressive behavior. Universal interventions are considered necessary for all children in the school population, regardless of individual risk status. Universal procedures may take the form of schoolwide initiatives, such as a building code of conduct or a peer mediation program, classroom level instruction in anger management or conflict resolution, and height-en staff supervision of identified problem physical spaces (see Sprague & Walker, 2005).

Secondary prevention employs selected measures such as small group skills training to target a subset of students who because of individual exposure to risk factors already are exhibiting behaviors considered precursor or marker behaviors for more serious problems in the school. The goal of these interventions is to prevent these less serious problems from evolving into more serious aggressive or violent behaviors in later grades.

At the tertiary level of the prevention hierarchy, indicated programs target the smallest group of students whose high level of risk involvement may be manifested in severe emotional-
behavioral disabilities, mental illness, or some form of volatile or aggressive behavior. Indicated prevention measures are best conceptualized as a structure of interacting supports under the direction of a collaborative team that figuratively “wrap” services around the student and often the family (see http://www.pbis.org/school/tertiary_level/wraparound.aspx and Eber, Sugai, Smith, & Scott, 2002).

At this juncture in the problem-solving process, the school safety team must align appropriate universal, selected, and indicated prevention measures with the action hypotheses developed from the assessment data. The focus of the programs and procedures that will comprise a comprehensive schoolwide violence prevention program will be guided by the assessment data from Steps 1 and 2 in the problem-solving process. Effective decisions about which particular program or procedure will be used to successfully address the action hypothesis demand that school safety team members become informed consumers of the research. Internet sites such as What Works Clearinghouse (http://ies.ed.gov/ncee/wwc/), the Hamilton Fish Institute (http://www.ham-fish.org/), and the Center for the Prevention and Study of Violence (http://www.colorado.edu/cspv/index.html) can provide helpful research foundations. Additional discussion on the topic of evidenced-based interventions in schools can be found in Kratochwill (2002), Kratochwill and Shernoff (2004), and in this volume.

Our hypothetical school safety team at Kennedy Elementary School consulted with experts from a local university, visited a neighboring school district to observe a number of intervention programs in action, conducted an Internet search for exemplar codes of conduct, and examined the literature for bullying prevention programs and anger management interventions. They subsequently aligned the primary, secondary, and tertiary needs of all their students in the areas identified in their action hypotheses. This process allowed them to establish reasonable timelines so that they could meet budgetary and staff development imperatives.

**Step 4: Response Implementation**

This phase of the problem-solving process is a critical step because the success or failure of the best planned violence prevention program rests squarely on the quality of its implementation. Fundamental to successful implementation are issues of social acceptability and intervention integrity. Social acceptability refers to “judgments by laypersons, clients, and others of whether treatment procedures are appropriate, fair, and reasonable” (Kazdin, 2001, p. 401). The school safety team needs to consider the impact that the proposed intervention will have on the students, the staff directly involved in the implementation, and the larger body of additional stakeholders in and out of the building.

Intervention programs that students find embarrassing, demeaning, or excessively harsh may be met with resistance (Elliott, Witt, Kratochwill, & Stoiber, 2002). In a hypothetical example, a middle school may find that although the hallway behavior of the sixth-grade students was positively influenced by the staff distribution of “Positive Behavior Lottery” tickets during passing time, the eighth-grade students found the intervention childish and tore up the tickets. The management of aggressive behavior in the school setting can entail the use of out of the ordinary or controversial procedures such as exclusionary time-out (e.g., Kazdin, 2001), pull-out anger management skills training (e.g., Larson & Lochman, 2010), or even physical restraint (e.g., Klotz, 2010). Consequently, schools may find that the use of a district-level oversight body to review proposed interventions for possible legal, ethical, or student and staff acceptability concerns will help avoid potential problems.

When a teacher or pupil services professional put into practice an evidence-supported intervention, there is a presumption that the procedures will be implemented in the same or very similar manner as was done in the supporting research. When this happens, the intervention is
said to have high treatment integrity (Gresham, 1989; Power et al., 2005). Integrity problems may arise if teachers or other personnel are asked to engage in intervention practices that they perceive as ineffective, overly complex, or poorly related to their own understanding of the problem. It is not enough for the school safety team alone to understand and be convinced of the merits of a school violence prevention plan; effective implementation demands that the personnel charged with carrying out that plan also share that understanding and conviction. The integrity of a prevention plan can be enhanced with thorough staff development training, assessment of training competencies, ongoing support and follow-through, and ongoing evaluation of adherence to the intervention program. Evaluating whether the intervention steps were followed can be accomplished through direct observations and through self-report and behavior rating scale methods that delineate each specific component of the intervention protocol (for examples, see Gresham, 1989).

School personnel also need to be cognizant of the impact that any new program will have on parents and on the greater community outside of the school. For instance, do all parents understand why instruction time is being taken away from traditional subjects in order to implement a new bully prevention curriculum? Is the prevention program targeting a specific group of students such that it could be perceived from the outside as racist, sexist, or otherwise discriminatory, in spite of benign, data-supported intentions? Are there significant budget issues to which taxpayers may object? Additionally, the age-old question “How will this play in the press?” is one worth asking. For example, a well-designed intervention that allows high risk youth to earn fast food coupons for identified positive behaviors may turn up in the newspaper as “Desperate School Now Paying Delinquents to Behave.”

These issues underscore the importance of effective communication, training, and team-building throughout the problem-solving process. The broadly representative school safety team structure stressed earlier gives voice to the various constituencies affected by the plan and helps ensure that potential problems are proactively addressed.

The school safety team at Kennedy Elementary presented their comprehensive school violence prevention plan to the school board, providing opportunities to begin the budget request process and to receive citizen input. They sent a press release to the local media outlets that described the rationale for their plan and the anticipated benefits for the school community. An informational parent meeting was held at the school, and additional flyers were sent home with all the children. In consultation with the faculty and pupil services staff, the team constructed a phased implementation plan over a two year span that allowed for (a) the most critical needs to be addressed first, (b) adequate funding from grants and the regular budget to be accumulated, and (c) sufficient opportunities for staff development.

**Step 5: Evaluation of Prevention Strategies**

The final phase of the problem-solving model involves both formative and summative evaluations of the response programs. A formative evaluation component is important for monitoring ongoing progress toward program goals and allows for changes to be made in the response implementation as dictated by the outcome assessment methods. For example, it may be that intervention integrity data (e.g., direct observations, self-report, or behavior rating scales of each specific component of the intervention protocol) indicate that the response protocol is too difficult to consistently implement. One then must analyze the reasons for this difficulty (e.g., insufficient training, insufficient program support) and perhaps recycle to an earlier problem-solving phase. Ongoing assessment also will help with decisions about program goal attainment and subsequent implementation to address the next problem as prioritized by the team.
At the primary prevention level, we suggest that a sub-sample of staff and students complete ongoing, formative assessments at least once per month to evaluate progress toward the outcome goals. The GAS method can be readily applied to formative evaluations in a time-efficient manner by assessing only those variables that have been identified as problems. At the secondary and tertiary levels, progress monitoring should occur more frequently, perhaps weekly or even daily depending on the target behaviors. The GAS method and time-series graphing are well suited for use with small groups or individuals.

A summative evaluation can be achieved by evaluating the level of convergence of the outcome goals. At the primary prevention level, a simple method is to average the GAS ratings for each problem variable to provide an overall convergent evidence rating. To evaluate time-series data at the secondary and tertiary levels, useful methods include GAS ratings, single-case effect sizes, percentage of non-overlapping data (PND), and trend analysis. If rating scales are used to monitor progress in a pre-post fashion, the reliable change index (RCI) may be useful. (For applications of these methods within problem-solving models, see Busse, Kratochwill, & Elliott, 1995, and Riley-Tillman & Burns, 2009.)

Traditional statistical methods also may be used to evaluate change, however, we believe that a criterion-referenced approach is most useful in applied school settings. A statistically significant change from pre- to post-intervention may not reflect the desired magnitude of change and, as such, may not demonstrate social or educational significance. Regardless of the evaluation method, several aspects of the prevention program will be continuously implemented; therefore, the assessment will be an ongoing enterprise to ensure that the program goals have been maintained.

After four months of the phased implementation, the school safety team at Kennedy School collected evaluation data using average GAS ratings and authentic disciplinary data. They found that schoolwide bullying continued at near baseline rates with a GAS rating of 0, but was beginning to demonstrate a positive trend, and fighting was less of a problem but still below program goals with a GAS rating of 1. Intervention integrity data were gathered through self-report ratings of adherence to each intervention step, which indicated that the staff was only adhering to an average of 60% of intervention steps, although supervision of problem areas had been followed through with 90% adherence. Following a staff development inservice conducted by a team from the local university, staff satisfaction with crisis response obligations showed significant improvement (GAS = 2). The Work Team for the revised code of conduct had been productive, and the initial draft was distributed to the faculty. Formative evaluation is ongoing to identify and strengthen those areas in need of enhanced intervention adherence, and to identify individual student progress at the secondary and tertiary levels of intervention.

Advantages and Disadvantages of the Problem-Solving Model

The major advantage of applying the problem-solving model to school safety concerns is the team-based approach toward systematic assessment and intervention (Table 4.2 delineates how the problem-solving model can be applied to practice). The model provides focus that can maximize resources and enhance intervention outcomes. That focus, however, has initial cost due to the significant amount of time, effort, and resources required to engage in a complete problem-solving process. Among these costs are the potential difficulties with buy-in from the staff and community when solutions are not immediately evident. Educators, however, must systematically approach school safety and violence prevention. School professionals often set up themselves and their constituents for failure in problem solving when specificity is lacking. If the data are too general, the intervention vague, and follow-through lacking, the likelihood is high that the prevention efforts will be ineffective.
Table 4.2  Implications for Practice: Using a Problem-Solving Approach to Prevent School Violence

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Problem Identification</td>
<td>Collect systematic data using archival data, surveys, observations, and interviews to enhance specificity</td>
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<tr>
<td>2. Problem Analysis and Hypothesis Development</td>
<td>Use a gating assessment procedure to validate the problem(s)</td>
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<tr>
<td>3. Problem Response Protocols</td>
<td>Employ data based response protocols for primary, secondary, and tertiary prevention</td>
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<td>4. Response Implementation</td>
<td>Collect systematic data with the measures used in problem identification</td>
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<td>5. Evaluation of Prevention Strategies</td>
<td>Engage in frequent formative evaluations</td>
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References


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